

**Remedial Design Report/Remedial Action Work Plan  
for the Environmental Management Disposal Facility,  
Oak Ridge, Tennessee:  
Early Site Preparation Activities**



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for the Environmental Management Disposal Facility,  
Oak Ridge, Tennessee:  
Early Site Preparation Activities**

Date Issued—March 2023

Prepared for the  
U.S. Department of Energy  
Oak Ridge Office of Environmental Management

United Cleanup Oak Ridge LLC  
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## ACRONYMS

ARAR	applicable or relevant and appropriate requirement
BCV	Bear Creek Valley
BMP	best management practice
CBCV	Central Bear Creek Valley
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act of 1980
CO	Contracting Officer
D	Drainage
DOE	U.S. Department of Energy
EMDF	Environmental Management Disposal Facility
EPA	U.S. Department of Energy
ESP	Early Site Preparation
NT	North Tributary
OREM	Oak Ridge Office of Environmental Management
ORNL	Oak Ridge National Laboratory
ORR	Oak Ridge Reservation
ORRL	Oak Ridge Reservation Landfill
PPE	personal protective equipment
RAWP	Remedial Action Work Plan
RCRA	Resource Conservation and Recovery Act of 1976
RDR	Remedial Design Report
ROD	Record of Decision
TDEC	Tennessee Department of Environment and Conservation
UCOR	United Cleanup Oak Ridge LLC
USF&WS	U.S. Fish and Wildlife Service
W	West
Y-12	Y-12 National Security Complex

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## EXECUTIVE SUMMARY

The *Record of Decision for Comprehensive Environmental Response, Compensation, and Liability Act Oak Ridge Reservation Waste Disposal at the Environmental Management Disposal Facility, Oak Ridge, Tennessee* (Environmental Management Disposal Facility [EMDF] Record of Decision) (DOE/OR/01-2794&D2/R2) presents the selected remedy of construction and operation of an onsite waste disposal site for Oak Ridge Reservation (ORR) Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) waste. (Note that the EMDF is also referred to as the Onsite Waste Disposal Site.) EMDF supports the U.S. Department of Energy Oak Ridge Office of Environmental Management's mission to decommission and demolish facilities and conduct remedial actions under CERCLA on the ORR in Oak Ridge, Tennessee. This effort requires an estimated 2.2 million cy of additional landfill disposal capacity for the disposal of wastes from CERCLA cleanup actions. As such, the EMDF will be constructed in Central Bear Creek Valley.

Early Site Preparation (ESP) activities are being conducted to expedite the project and clear interferences to site development. ESP activities will support future construction of the disposal cells and support facilities by performing the initial activities necessary to support large-scale site development. The ESP activities include the following:

- Reroute of the existing Bear Creek Road and Haul Road
- Initial preparation for Site 7b borrow area development
- Extension of water line utilities (fire and potable water) to the EMDF Project area
- Extension of power line utilities (electrical) to the EMDF Project area
- Installation of Construction Support Area (including trailer and parking areas)

This Remedial Design Report/Remedial Action Work Plan (RDR/RAWP) describes the scope of the ESP and activities related to these tasks. The ESP activities will occur in uncontaminated areas; therefore, waste generated is expected to be disposed at the Oak Ridge Reservation Landfills. The remaining EMDF scope will be addressed in separate future documents.

A Stormwater Management Requirements document will be implemented to protect surface water during implementation of this scope. The design packages (technical specifications and construction drawings) for each of the ESP elements are included in Appendices A–E to this RDR/RAWP.

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# 1. INTRODUCTION

## 1.1 PURPOSE AND SCOPE

The *Record of Decision for Comprehensive Environmental Response, Compensation, and Liability Act Oak Ridge Reservation Waste Disposal at the Environmental Management Disposal Facility, Oak Ridge, Tennessee* (Environmental Management Disposal Facility [EMDF] Record of Decision [ROD]) (DOE/OR/01-2794&D2/R2) presents the selected remedy of construction and operation of an onsite waste disposal site for Oak Ridge Reservation (ORR) Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) waste. (Note that EMDF is also referred to as the Onsite Waste Disposal Site.) EMDF supports the U.S. Department of Energy (DOE) Oak Ridge Office of Environmental Management's (OREM's) mission to decommission and demolish facilities and conduct remedial actions under CERCLA on the ORR in Oak Ridge, Tennessee. This effort requires an estimated 2.2 million cy of additional landfill disposal capacity for the disposal of wastes from CERCLA cleanup actions. As such, EMDF will be constructed in Central Bear Creek Valley (CBCV).

The overall EMDF project consists of the disposal facility, wastewater storage/treatment, support facilities, and borrow areas. Early Site Preparation (ESP) activities are being conducted to expedite the project and clear interferences to site development. The ESP activities include the following:

- Reroute of the existing Bear Creek Road and Haul Road
- Initial preparation for borrow area development
- Extension of water line utilities (fire and potable water) to the EMDF Project area
- Extension of power line utilities (electrical) to the EMDF Project area
- Installation of Construction Support Area (including trailer and parking areas)

This Remedial Design Report/Remedial Action Work Plan (RDR/RAWP) describes the scope of the ESP and activities related to these tasks, the projected schedule for completion, and a project organization chart.

Based on the preliminary design, this ESP work is required prior to landfill construction; however, the ESP activities are not associated with the design or construction of landfill elements, including wastewater management facilities, that will contain or treat contamination related to waste placed in the future EMDF. ESP activities will protect public health and the environment through control of stormwater and associated sediment, avoidance of impacts to threatened and endangered species, and compliance with other substantive requirements in the EMDF ROD.

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## 2. SITE DESCRIPTION

The EMDF site is located in CBCV within an upland area located between north-south trending valleys of North Tributary (NT)-10 and NT-11. The site and surrounding areas are forested, except for areas along the south side between Haul Road and Bear Creek Road where the area has been cleared. The cleared area includes a recent soil-staging area along the southern margin and two wetland basins completed in 2015 for the Y-12 National Security Complex (Y-12) compensatory wetland mitigation. Haul Road and Bear Creek Road are located in the southern part of the site and will be relocated to the south prior to EMDF construction as part of the ESP activities (Fig. 1).

### 2.1 GEOLOGY

The EMDF disposal site predominantly overlies bedrock of the Conasauga Group, including the Maryville Formation and Nolichucky Shale (Fig. 2). These formations are predominantly shales, siltstones, and mudstones with little limestone present in the bedrock underlying the proposed disposal cells. The crest of the knoll below the north center of the footprint is underlain by the erosion-resistant Maryville Formation. The typical weathering profile of topsoil, silty/clayey soil residuum, saprolite, and fractured bedrock occupy the undisturbed site areas. Recent stream deposits are present along the streams and tributaries throughout EMDF.

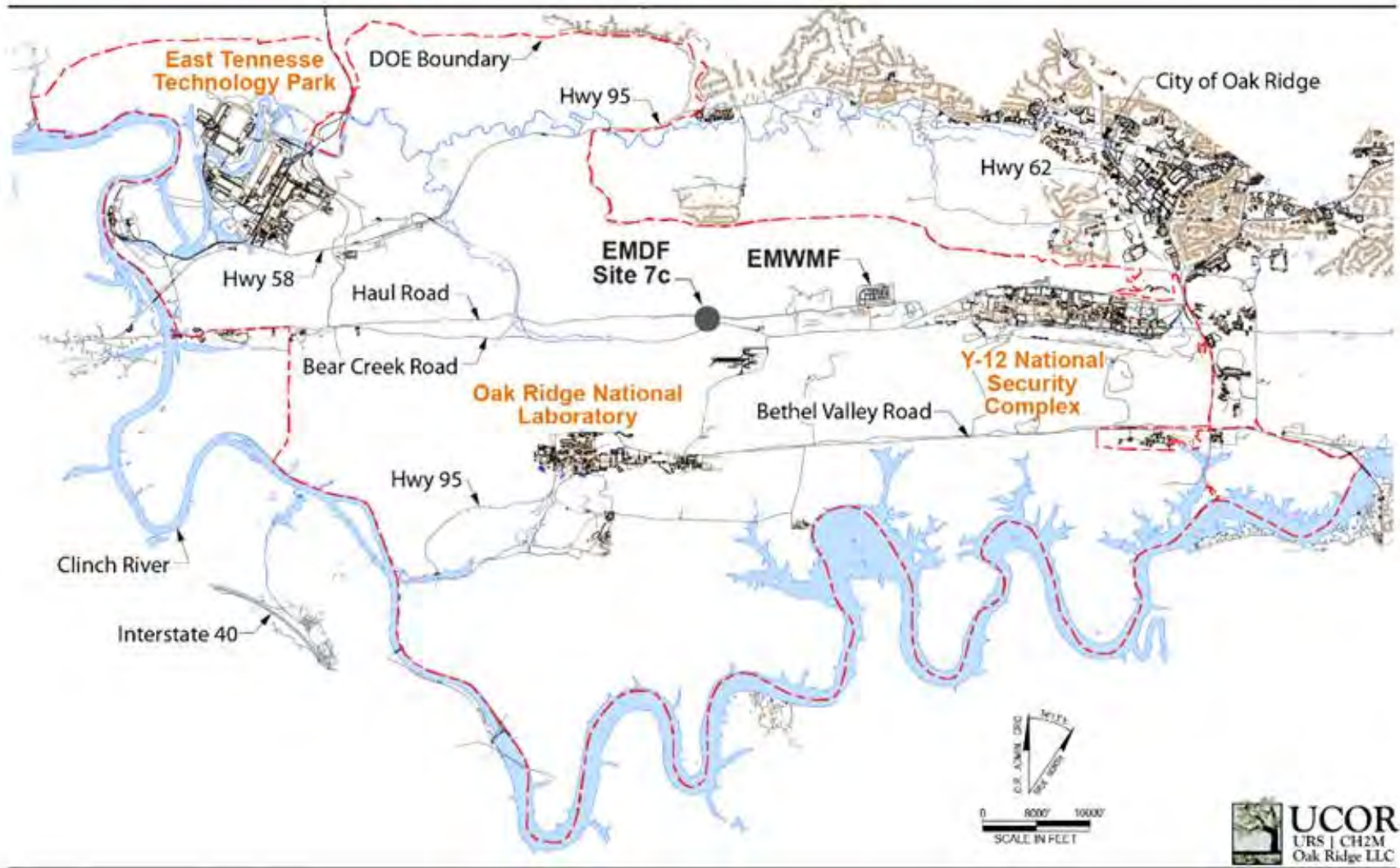
### 2.2 GROUNDWATER

Groundwater migrates from the upland areas along Pine Ridge and discharges to stream channels, supporting base flow within the NT streams and Bear Creek. Although there is contaminated groundwater in Bear Creek Valley (BCV), the extensive dataset from sampling efforts in BCV used in the Remedial Investigation/Feasibility Study indicates that the site selected for EMDF is not located over existing groundwater contamination plumes.

Thirty-two piezometers were installed across the EMDF site to better understand the geology and groundwater elevations at EMDF (Fig. 2). These piezometers were installed in representative geologic formation and locations. Downhole monitors were installed in each piezometer to collect continuous depth to groundwater, pH, and water temperature data. The piezometers have been monitored since 2018.

The water-level data collected to date at EMDF show that, in general, the vertical hydraulic gradients between the shallow and deeper bedrock zones are mostly flat (less than 0.03 ft/ft vertical gradient). Three well pairs consistently have a slight downward gradient (GW-978/GW-979, GW-980R/GW-981, and GW-988/GW-989). They are located at the northern saddle area, on the knoll to the northwest, and on the knoll to the southwest, respectively. Slight upward vertical hydraulic gradients have only been observed at well pairs GW-992R/GW-993 and GW-994/GW-995, with a maximum upward gradient of 0.07 ft/ft. Both of these well pairs are located in the southern part of the proposed EMDF footprint near Haul Road. All other well pairs have gradients of less than 0.03 ft/ft at all times.

Piezometric surface elevations confirmed that the piezometric surface generally mirrors topography (i.e., is higher topographically beneath knolls/ridges and lower near the tributaries). The piezometric surface responds to rainfall events, indicating recharge is occurring on the site. Seasonal variation is also observed, with higher piezometric surfaces observed during the winter/spring wet season (typically November to March) than in the summer/fall dry season.



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Fig. 1. EMDF location.



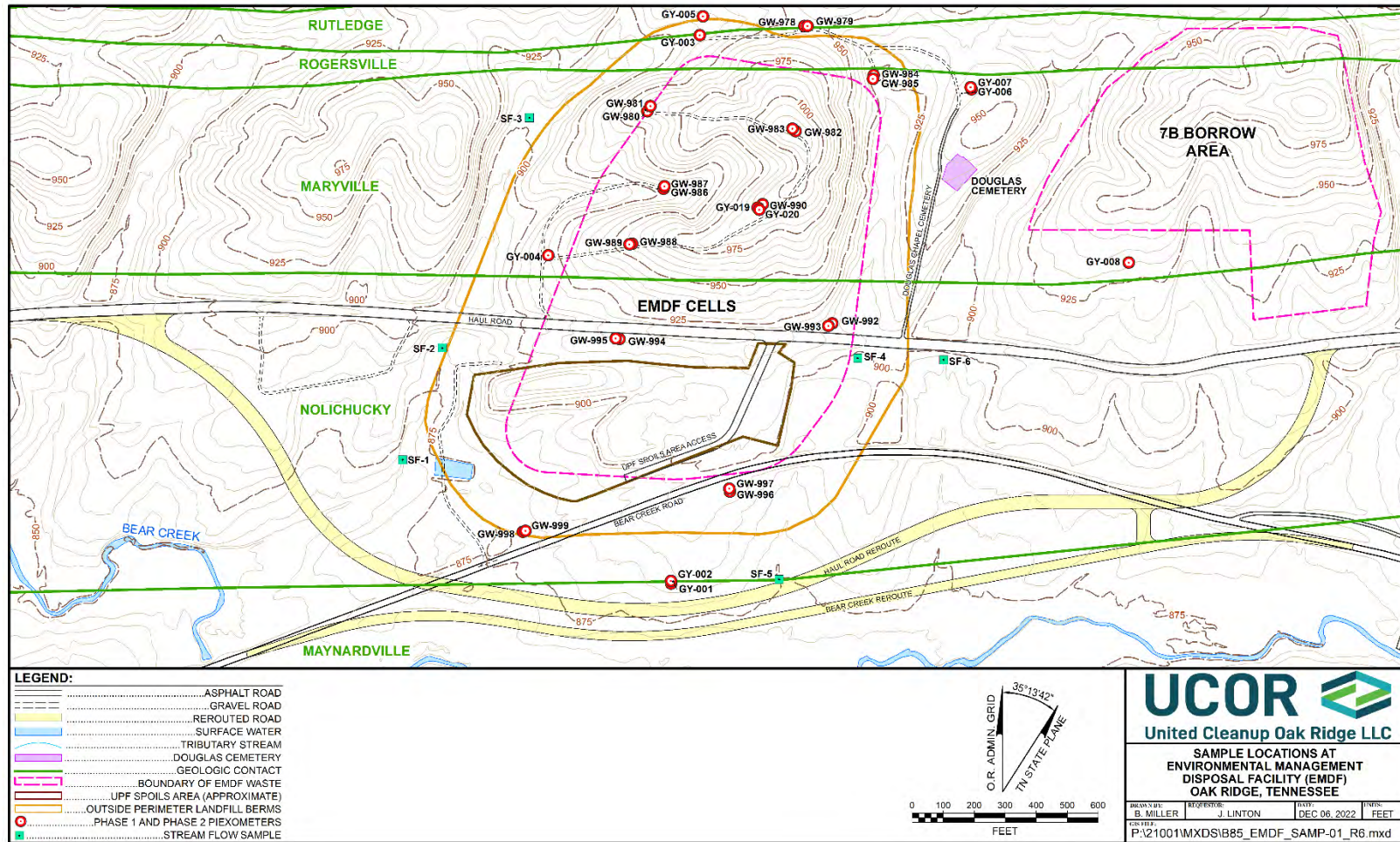


Fig. 2. EMDF area and existing piezometers.

The gradients and piezometric surface confirm that localized groundwater at the site, in general, results from recharge occurring on the higher elevations of the site. The tributaries have some influence on the groundwater flow in their immediate areas acting as localized discharge locations.

### **2.3 SURFACE WATER**

Surface water drainages near the site include NT-10, NT-11, Drainage (D)-10 West (W), and D-11 East, an east–west trending feature that drains westward into NT-11 near the center of the site (Fig. 2). Surface water in these drainage channels flows down Pine Ridge, away from residential areas, to Bear Creek located on the valley floor. The EMDF site surface water systems are fed by precipitation, surface runoff and shallow stormflow, and groundwater that discharges via springs and seeps.

Stream flow is primarily a result of precipitation events and from subsequent shallow seeps with limited flow or dry stream conditions during the summer months. Shallow soil can act as a stormflow layer when flow is present, with surface water transport through macropores that emerge as visible flow further downstream (DOE/OR/01-2819&D1, *Technical Memorandum #2, Environmental Management Disposal Facility, Phase I Monitoring, Oak Ridge, Tennessee*). Meandering stream channels filled with sediments are present upstream of the Haul Road culverts and are not typical of other higher gradient streams found across the ORR.

Continuous flow monitoring data for NT-10, NT-11, and D-10W were collected as part of Phase 1 site characterization. The available U.S. Geological Survey base-flow data indicate that base flow is continuous along the D-10W, NT-10, and NT-11 stream channels during the winter/spring non-growing wet season. During the summer/fall growing season with warm and often dry conditions, base flow is negligible and limited to pulsed flow associated with significant storm rainfall events (Robinson and Johnson 1995, *Results of a Seepage Investigation at Bear Creek Valley, Oak Ridge, Tennessee, January – September 1994*). Flow monitoring for Bear Creek downstream of the EMDF site indicates continuous flow in Bear Creek (DOE/OR/01-2695&D2/R1).

Several seeps are located adjacent to the drainages and tributaries, indicating localized shallow groundwater discharge occurs there at least seasonally.

### **2.4 ECOLOGICAL RESOURCES**

A detailed natural resource evaluation and wetland delineation study was performed over most of the EMDF footprint (Fig. 3). The evaluation is documented in *Natural Resource Assessment for the Proposed Environmental Management Disposal Facility (EMDF), Oak Ridge, Tennessee* (ORNL/TM-2018-515). This evaluation covered all of the ESP activity areas, except for the following small areas:

- Westernmost extension of Haul Road
- Water line extension outside of the EMDF footprint and along Bear Creek Road
- Power line extension outside of the EMDF footprint and along Haul Road
- Removal of the abandoned power line outside of the EMDF footprint along Haul Road

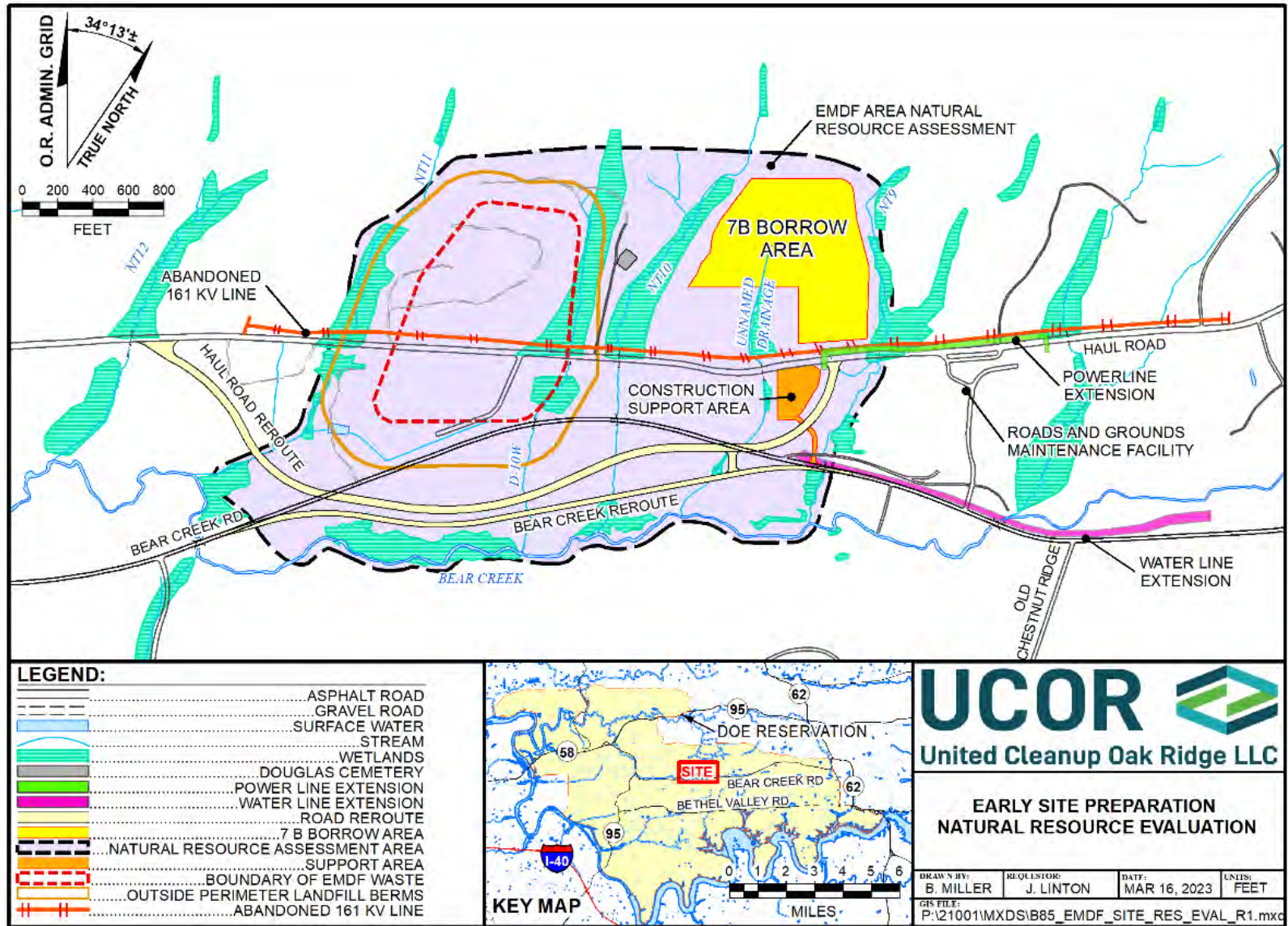


Fig. 3. EMDF natural resource evaluation and ESP activities.

The natural resource assessment included wetland delineation and evaluation, stream surveys, timber assessments, and rare species surveys. In addition, walkdowns were conducted in the fall/winter of 2022 to evaluate the extension of Haul Road that was not covered by the initial natural resource evaluation (Fig. 3). The results of the natural resource evaluation are summarized below, particularly as these apply to the ESP scope and activities.

**Wetland delineations:** Potential wetlands were evaluated for the entire EMDF project site relative to the dominance of wetland vegetation, soils, and hydrological characteristics. Seventeen wetlands, including one created wetland, were identified within the entire EMDF study area, covering 11.8 acres (Fig. 3).

However, the ESP scope was designed and will be constructed to minimize impacts to these wetlands. Two separate wetland areas of approximately 0.1 acre each cannot be avoided, as described in Sect. F.4.2, and there is potential for another 0.1 acre of wetland to be disturbed during culvert replacement. The culvert replacement is likely to be conducted such that wetland disturbance can be minimized or eliminated. Mitigation requirements for the ESP scope will be tracked as part of the cumulative impacts from the EMDF project and mitigated as required.

**Stream surveys:** The Bear Creek watershed is home to a strong population of Tennessee dace, the only fish on the ORR listed as “in need of management” by the Tennessee Wildlife Resources Agency. During the fish surveys, no Tennessee dace were observed in the tributary streams at the EMDF site; however, EMDF stormwater controls will protect Tennessee dace in streams that may be impacted by ESP activities.

**Timber assessments:** As described in ORNL/TM-2018-515, a timber inventory in the EMDF area was completed in 2014 and was used to provide additional data to supplement the 2018 timber assessment. The ESP area was almost entirely subject to timber harvesting during a southern pine beetle outbreak in 2000. Dense regeneration of loblolly pine provides the dominant cover. The inventory map (ORNL/TM-2018-515, Fig. 5) and recent assessment shows that the trees are primarily lower-canopy height consistent with timber harvesting in 2000.

**Rare species surveys:** Previous investigations to identify threatened and endangered species on the ORR (ORNL/TM-2015/248), *Bat Species Distribution on the Oak Ridge Reservation*, in general, have confirmed the presence of Indiana bats, gray bats, and the northern long-eared bat, all federally listed endangered species; tricolored bats, which are proposed for federal listing; and little brown bats, which are under consideration for federal listing. Results of the bat acoustic surveys indicated that forested portions of the EMDF project area are used as summer habitat by state- and federally listed bat species. One federally listed endangered species (gray bat) may forage within the site boundaries but does not roost in these areas. Informal consultation with the U.S. Fish and Wildlife Service (USF&WS) was conducted in early 2023 and is documented in Appendix F, Attachment F.1.

Additional rare species surveys were performed for the EMDF site in 2018. The EMDF project surveys noted that there did not appear to be large populations of either the northern long-eared bat or the Indiana bat (ORNL/TM-2018-515). No maternity roosts for the Indiana bat were found in the EMDF area. Much of the ESP activities will take place in areas forested with younger, Loblolly pines. Less than 50 potential bat-roosting trees were identified in the ESP areas. These are not the preferred roosting trees for bats. Additional evaluation was performed in 2023 to evaluate for the presence of potential roosts of tricolored bats, such as road culverts and riparian buffer zones, and potential roost areas were identified. Informal consultation for bats and migratory birds was performed with the USF&WS (Appendix F, Attachment F.2).

Other threatened and endangered species surveys were conducted by the Oak Ridge National Laboratory (ORNL) in 2018 (ORNL/TM-2018-515). The tubercled rein orchid, listed as threatened on the Tennessee Rare Plant List, was found in wetlands within the study area, particularly in wetlands along the NT-9 and D-10W streams. D-10W and NT-9 both have large populations of rein orchids. Two other plant species of interest found were the American ginseng and pink lady's slipper, which are considered of concern because of commercial harvest. The four-toed salamander and the Wood Thrush (state-listed as In-Need-of-Management) were also confirmed to occur throughout forested portions of the study area. Wetlands and drainages within the area were found to contain the highest densities of four-toed salamander breeding sites known on the ORR. The ESP scope was designed to avoid areas with these species. Tennessee Wildlife Resources Agency and Tennessee Department of Environment and Conservation's (TDEC's) Division of Natural Areas were notified of the planned activities and the approach for minimizing impacts to sensitive resources (Appendix F, Attachment F.2).

No federally listed threatened or endangered bird species were noted during the surveys; however, certain species recorded during the surveys have other state and/or federal management designations. These include dozens of species of birds protected under the Migratory Bird Treaty Act and/or are considered Birds of Conservation Concern by the USF&WS. The site is on the southern edge of the largest area of contiguous interior forest on the ORR that supports rare bird species. These rare species are not typically found in more fragmented habitats (ORNL/TM-2018-515). The ESP activities are primarily in the loblolly pine areas previously logged in 2000.

Appendix F contains additional information on the minimal sensitive resources present in the ESP areas and how impacts to those resources are expected to be negligible. Any necessary mitigation (if identified) will be performed as part of the overall EMDF landfill construction effort. The Groundwater Field Demonstration Remedial Design Work Plan/RAWP (in progress) will contain the impacts and mitigation for the remainder of the EMDF Project, including the landfill and support areas.

## **2.5 CULTURAL RESOURCES**

The Douglas Chapel Cemetery and four historical home site/structures are present near the EMDF site (Cultural Resource Analysts, Inc., *Phase I Archaeological Survey of the Proposed Environmental Management Disposal Facility in Central Bear Creek Valley, Roane County, Tennessee*). Douglas Chapel Cemetery is located on the knoll between NT-10 and D-10W. DOE intends to avoid and preserve the Douglas Chapel Cemetery, as well as maintain access to the cemetery for visitors.

The four home sites were demolished when the federal government purchased the land for the Manhattan Project. A prehistoric habitation was located near Bear Creek where lithic flakes were found, an indication of prehistoric tool production. All the sites were highly disturbed and appeared to contain no buried cultural deposits. The sites were not recommended for inclusion in the National Register of Historic Places.

No historical sites are located within the areas affected by ESP activities.

## **2.6 EXISTING UTILITIES**

Services required for site construction and operations must be extended from existing systems because the EMDF site is not currently served by any utilities. The utilities required at the site include three-phase power, water, and voice and data communications. Utility systems available near the EMDF site are managed by several organizations that act as the purveyors of the services, including Consolidated Nuclear Services Y-12 Power Operations (electrical power) and the City of Oak Ridge (water). ESP activities will

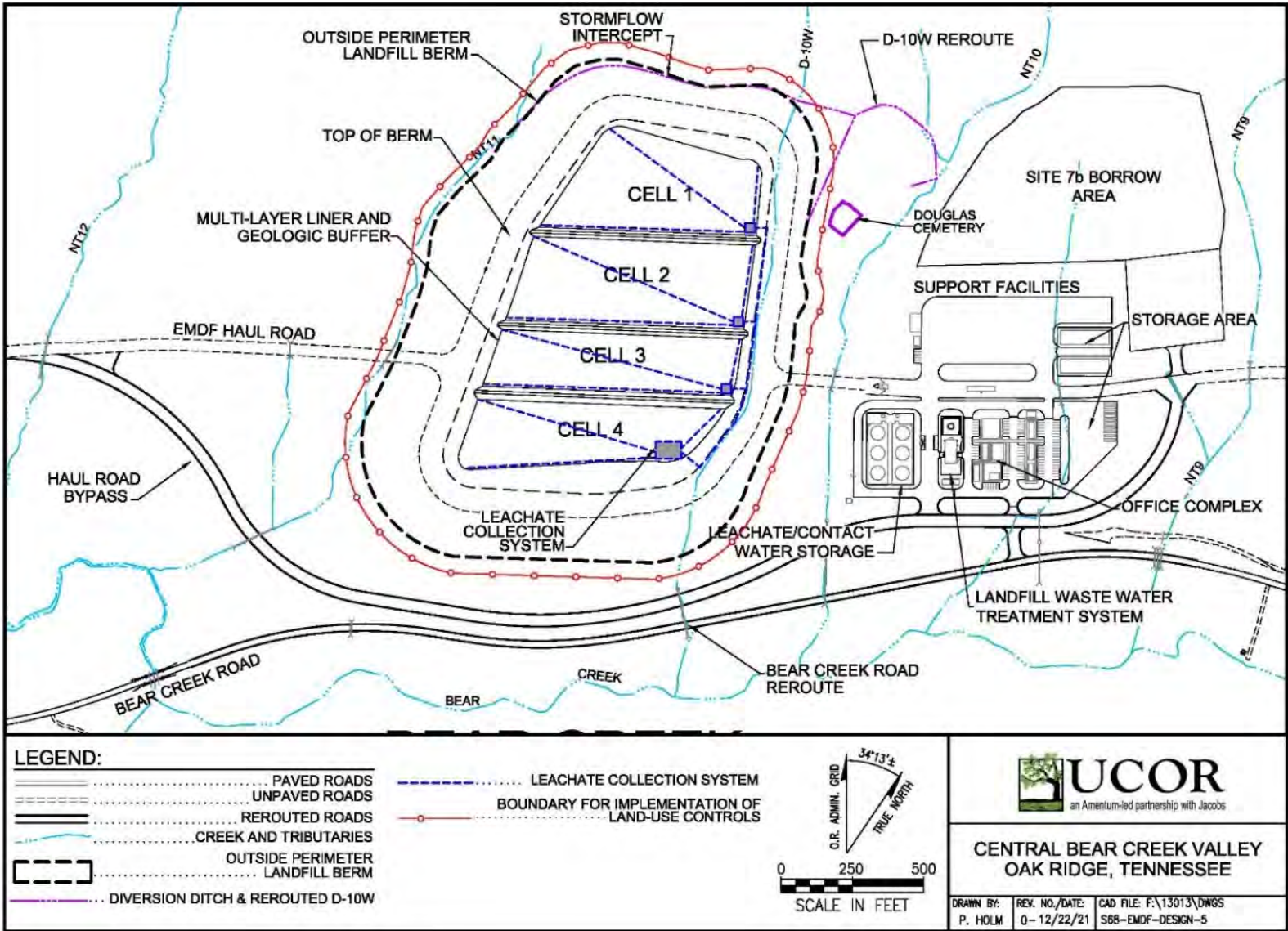
extend the power lines and water lines to the EMDF site, and communication and data lines will be extended at a later date. Existing utility connections are available within 1 mile east of the EMDF site along the existing Haul Road and Bear Creek Road.

There is an abandoned 161 kV power transmission line that bisects the EMDF site. The line is located on the north shoulder of Haul Road and runs in an east-west orientation across the site footprint. The ESP scope includes the removal of the portion of the power line that is within the site footprint, as well as additional six power line wooden support structures that extend east of the footprint. The line is de-energized, with conductors “air-gapped” on both ends of the affected segment.

### **3. PROJECT DESCRIPTION**

The conceptual design of EMDF (Fig. 4) is based on a total constructed volumetric capacity of approximately 2.2 million cy, with approximately 100 acres impacted during development. EMDF will be designed and constructed to meet applicable or relevant and appropriate requirements (ARARs) as included in the EMDF ROD, including a liner and cap system compliant with Resource Conservation and Recovery Act (RCRA) requirements. Surface water and groundwater will be managed by diverting water around the facility and constructing a liner and geologic buffer system that will isolate the facility from groundwater. A leachate collection system and other support facilities, including a landfill wastewater treatment system, will also be designed and constructed as part of EMDF; final details will be included in a separate RDR for the landfill design. Figure 4 presents a conceptual layout of the landfill and its supporting features. The footprint and supporting features could change during the final design of the landfill.

ESP activities will support future construction of the disposal cells and support facilities by performing the initial activities necessary to support large-scale site development. These ESP activities include rerouting Haul Road and Bear Creek Road, extending utilities to the site, initial preparation of the Site 7b borrow area, and installation of a Construction Support Area. Figure 5 shows the general locations for the ESP activities. Stormwater management requirements will be implemented to protect surface water during implementation of this scope.



Note: Settling basins for uncontaminated stormwater will be provided in the final design.

Fig. 4. EMDF conceptual site layout.



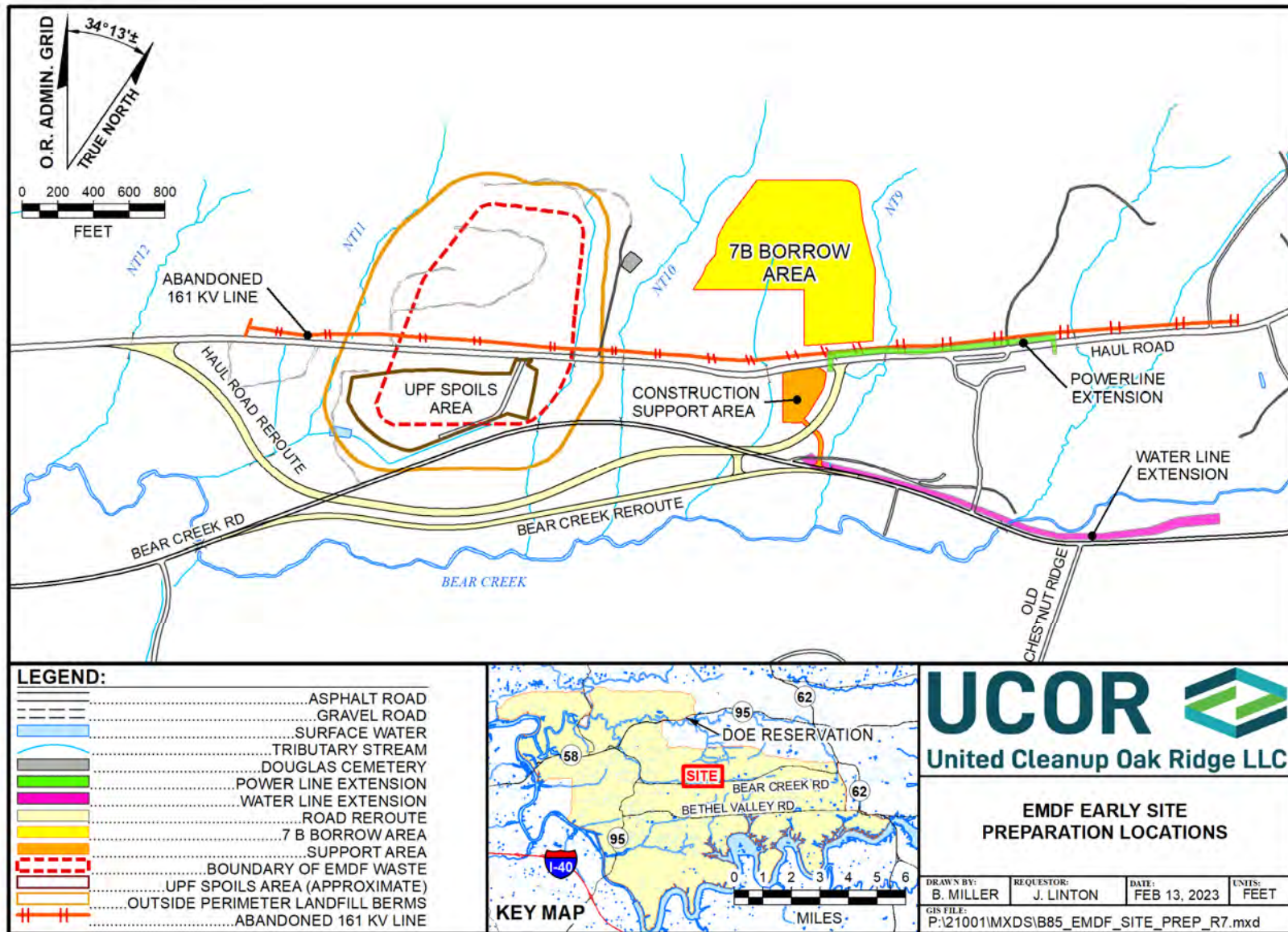


Fig. 5. Location of ESP project areas.

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## 4. REMEDIAL DESIGN REPORT

The following section provides a summary of the ESP activities. The design packages (technical specifications and construction drawings) for each of these elements are included in Appendices A–E to this RDR/RAWP. Note that the design packages include references to a Storm Water Pollution Prevention Plan; these citations refer to the *Stormwater Management Requirements for Early Site Preparation for the Onsite Waste Disposal Facility, Oak Ridge, Tennessee* (UCOR-5215).

### 4.1 ROAD REROUTES

Construction of EMDF requires relocation of a segment of Haul Road (which is part of an existing CERCLA action), which presently bisects the proposed disposal cells, as well as a portion of Bear Creek Road to provide sufficient landfill capacity. These roads have been designed and will be rerouted as part of ESP activities.

Both roads will be rerouted to the southern portion of the site closer to Bear Creek. Haul Road will be rerouted between NT-9 and NT-12, a distance of approximately 4600 ft, while Bear Creek Road will be rerouted between NT-9 and its crossing of Bear Creek near NT-11, a distance of approximately 3700 ft. The realignment for both Bear Creek Road and Haul Road are shown in Fig. 5.

The following constraints were considered for the design:

- Provide the largest practical footprint for construction of the disposal cells, while avoiding road construction to the greatest extent possible in the 500-year floodplain of Bear Creek.
- Avoid modifications to Bear Creek Road at the creek crossing west of the landfill site boundary where three 54-in. reinforced concrete pipe drain tiles extend under the roadway. Also avoid modifications to Bear Creek Road at the entrance to the Roads and Grounds Maintenance Facility to the east of the site boundary. Tie-ins between the existing road and the rerouted segment will fit between these two points.
- Establish roadway curves to be as large as possible, with a minimum curve radius, to allow safe traffic at the posted speed limit and proper sight distance.
- Maintain a 50-ft buffer between the edge of Bear Creek Road and the edge of Haul Road.

Appendix A contains the engineering design drawings and specifications for the road reroutes.

### 4.2 UTILITIES EXTENSIONS

Utilities will be extended to the EMDF site as part of ESP activities. These utilities include electrical power and water, as shown in Fig. 5. Radios or cellular phones will be used for communications to these sites (note that extension of voice and data communications utilities will be addressed at a future date, as needed). Utility requirements will vary throughout the multiple stages of site development; however, they have been planned such that capacity will be available, as needed, for all phases of site activities over the life cycle of the project.

It is assumed that no utilities will be extended specifically to the Site 7b borrow area; power for the borrow area will be provided by portable generator, as needed. Portable sanitary facilities will be used, and water will be hauled in for soil conditioning.

#### **4.2.1 Electrical Power**

Electrical power services will be provided sufficient to handle the power loads for all phases of EMDF development, including load demands for the landfill wastewater treatment facility, office complexes, climate-controlled storage units (conex type), site exterior lighting, pumping systems, instrumentation and controls, heat tracing, and ground fault circuit interrupter receptacles for cord-connected tools or equipment.

Electrical power will be extended from Y-12's existing 13.8-kV, 3-phase overhead distribution line to the EMDF Construction Support Area, with tie-in at the Roads and Grounds Maintenance Facility. Data communications cables will be installed at a later date and are not part of the ESP work scope; however, an allowance has been made for the clearances and loading associated with these cables, which will be installed on the new power poles.

The ESP extension of electrical power scope also includes removal of an existing, abandoned 161 kV power transmission line. This task will remove four wooden pole structures and hardware, conductors, and guys that are within the footprint of the future Groundwater Field Demonstration and EMDF (when developed), as well as an additional six that extend east of the footprint. The ESP design identifies the section to be demolished and addresses stabilization of the remaining portion of the line.

Appendix B contains the engineering design drawings and specification for the electrical power extension.

#### **4.2.2 Water**

Water services will be provided sufficient to handle the water demands for all phases of EMDF development, including site fire protection, building sprinkler systems, potable water for site personnel and the landfill wastewater treatment facility, and construction/dust control water for tanker trucks.

Water is anticipated to be extended to the eastern boundary of the EMDF site via a new 12-in. high-density polyethylene (HDPE) pipe, extending from the City of Oak Ridge's existing 24-in. water line to the EMDF Construction Support Area. The water line extension is approximately 1800 ft in length. The tie-in of the water line will be at the City of Oak Ridge's Valve Pit 43, and the piping arrangement will provide for the continued function of Valve Pit 43 for blow-down.

The existing polyvinyl chloride (PVC) service to the Roads and Grounds Maintenance Facility will be disconnected and a temporary HDPE pipe will be installed aboveground as a by-pass to allow water service to continue while the new water line is constructed. Construction of the new water line will require removal of the existing 2-in. PVC line along much of its length due to the narrow corridor along the shoulder of Bear Creek Road.

At the location where the new water line crosses over a series of culverts at Bear Creek, the existing guardrail will be removed to allow installation of the water line, and a new guardrail will be installed following installation of the water line.

An 8-ft × 28-ft pre-manufactured metal building will be constructed at the entrance to the Roads and Grounds Maintenance Facility to house a backflow preventer. Components within the Backflow Preventer Building will consist of ductile iron pipes and fittings with flanged connections. Associated components will include a bypass line with air vent/vacuum breaker to allow maintenance of the backflow preventer, connection to a permanent PVC pipe for service to the Roads and Grounds Maintenance Facility, and water meters for both the EMDF line and the Roads and Grounds line.

Appendix C contains the engineering design drawings and specifications for the water line extension.

### **4.3 INITIAL BORROW AREA PREPARATION**

ESP actions at the Site 7b borrow area will include clearing and grubbing the selected areas for initial development and clearing and constructing an access road and stormwater management measures to allow for subsequent development and operation of the borrow area.

Initial preparation of the Site 7b borrow area will involve construction of an access road and a staging area for parking heavy equipment. The areas to be disturbed will be 1 acre or less. The access road, approximately 42 ft wide with a gravel and geotextile underlayment, will be constructed from the perimeter of the borrow area to Haul Road. Approximately 75 linear ft of road is anticipated to be installed for the initial preparation of Site 7b. The parking area, with 12 in. of gravel and geotextile underlayment, will also be constructed for use by operations personnel and visitors.

Appendix D contains the engineering design drawings and specifications for the initial preparation of the Site 7B borrow area.

### **4.4 CONSTRUCTION SUPPORT AREA**

The Construction Support Area will be approximately 2 acres in size, with a 6-in.-aggregate base over geotextile. A temporary access road, approximately 600 ft long, will be extended from the existing Bear Creek Road to the area; adjustments to the road grade and alignment will be made as construction progresses and interfaces with the new Haul Road, water line, and hydrant arise. A locking bar gate or other barrier will be installed at the intersection of the Construction Support Area roadway with Haul Road to prevent public access to Haul Road.

A temporary water truck filling station will be provided at the new water line hydrant location. Temporary water and power will be provided to the construction trailer area.

Appendix E contains the engineering design drawings and specifications for the preparation of the Construction Support Area.

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## 5. REMEDIAL ACTION WORK PLAN

Because this action consists of new construction in a clean area, verification, monitoring and operations, and maintenance plans are not required. ESP activities will be performed under the purview of United Cleanup Oak Ridge LLC's (UCOR's) existing programs and procedures, including health and safety, quality assurance/control, and waste management. Fill materials used for ESP activities will be clean and free of contaminants. Quarried rock products are considered as clean material due to the nature of the material. In addition, ESP activities will comply with environmental laws and regulations identified in the EMDF ROD as ARARs.

The *Stormwater Management Requirements for Early Site Preparation for the Onsite Waste Disposal Facility, Oak Ridge, Tennessee* (UCOR-5215) supports the ESP clearing and grading activities and presents erosion and sediment control best management practices (BMPs). Erosion and sediment control BMPs anticipated to be incorporated include:

- Minimizing disturbed areas
- Controlling stormwater runoff
- Stabilizing disturbed soils as soon as practical
- Protecting slopes and storm inlets downgradient from the work area
- Establishing perimeter controls
- Retaining sediment onsite

The ESP design is based on runoff from a 25-year, 24-hour storm and considers the runoff from a 100-year, 24-hour storm. Erosion control is in accordance with the ESP Stormwater Management Requirements document; sediment/erosion control measures are designed in accordance with the EMDF ROD ARARs, including guidance presented in the *Tennessee Erosion and Sediment Control Handbook* (TDEC 2012).

ESP construction activities are to be phased to minimize the amount to disturbed areas exposed at any given time. Perimeter runoff controls, including silt fences, straw wattles, and construction exits will be installed prior to clearing and grubbing. Clearing, grubbing, stripping, and grading will only occur in designated construction areas where improvements are planned. Natural features and vegetative soil cover outside of the construction areas will be protected to avoid disturbance to trees or vegetative cover and to minimize soil erosion.

The following erosion and sediment control BMPs will be applied for the ESP construction activities:

- Control of stormwater flowing onto and through project area
  - Straw wattles: serve as run-on diversion, runoff filtration, water velocity dissipation
  - Check dams: installed in swales and ditches to reduce velocity in channels and thereby reduce erosion
  - Diversion berm: divert rainwater away from the cut slopes and control stormwater flowing onto the project

- Stabilization of soils
  - Hydromulching: protect exposed soils
  - Seeding and straw mulch: lawn areas will be seeded and stabilized with straw or similar mulching material
  - Roadway gravel/road base: placed on all areas receiving vehicular traffic (access roads and staging areas)
- Protection of slopes
  - Erosion control blankets: used to stabilize slopes in swales, cut slopes, and sediment basin
- Protection of storm drain inlets
  - Straw wattles: protection for storm drain inlets (catch basins) until permanent vegetation has been established
- Perimeter controls and sediment barriers
  - Silt fences: installed along the toe of fill slopes and around topsoil stockpiles
- Stabilized construction exits
  - Anti-tracking pads: installed at project egress locations to prevent the offsite transport of sediment by construction vehicles
- Dust control: use of a water truck to apply water to disturbed areas to control dust

Additional BMPs not presented here may be incorporated, as needed. Impacts to waterbodies will be minimized through implementation of BMPs.



## 6. WASTE MANAGEMENT

This section identifies the sanitary and industrial waste streams that are expected to be generated during the ESP activities. As summarized in Sect. 2.2.1 of the EMDF ROD, the EMDF site, including where the ESP activities will occur, is in an uncontaminated area of BCV; therefore, waste materials are expected to be disposed at the Oak Ridge Reservation Landfills (ORRLs). A summary of waste stream characterization during ESP activities is provided in Table 1, which describes, quantifies, and defines waste streams and identifies the expected disposal outlet(s). While contaminated waste streams are not anticipated, if discovered or generated, DOE will notify the U.S. Environmental Protection Agency (EPA) and TDEC and those waste streams will be evaluated and characterized for disposal at the Environmental Management Waste Management Facility or other suitable disposal facility.

Vegetation removed during ESP activities is not expected to be waste. Marketable timber will be harvested as possible and practical, segregated, and removed. The remaining vegetation is expected to be used at the EMDF site for mulch and/or erosion control (some of which may be chipped). Vegetation removal and management will be in accordance with the Stormwater Management Requirements Plan and BMPs, as discussed in Chap. 5. The remaining vegetation will be evaluated for other beneficial use as practical. Secondary waste generated during the primary waste-generating activities is expected to be disposed with the primary waste streams.

### 6.1 ROAD REROUTES

Expected or potential waste streams from the road reroutes include the following:

- Asphalt, gravel, and soil from road demolition
- Metal debris items (such as bollards, guard rails, road signs, etc.)
- Wood/concrete debris from limited activities, such as forming and placing concrete for headwalls or splash pads at new culvert installations
- Hydraulic line spill cleanup material (during construction activities)
- Associated secondary waste (personal protective equipment [PPE], plastic sheeting, rags, wipes, etc.)

The expected waste streams for this activity are detailed in Table 1, including the expected volume, waste type(s), characterization basis, expected disposal outlet(s), and other relevant waste management information. All of the waste from this activity is expected to be eligible for disposal in the ORRLs. Asphalt samples from Bear Creek Road will be collected and analyzed, as needed, to confirm the eligibility of the asphalt for ORRL disposal.

It is assumed that unused materials (e.g., surplus materials) from the construction of the rerouted sections of Bear Creek Road and Haul Road will be removed from the site by the subcontractor performing the work and will not be a waste stream managed during this activity. If it is disposed onsite, it will be disposed at the ORRLs.

**Table 1. Summary of waste stream characterization during ESP activities**

<b>Waste stream</b>	<b>Expected volume</b>	<b>Expected waste type</b>	<b>Characterization basis</b>	<b>Comments</b>
<b>Haul Road and Bear Creek Road Reroutes</b>				
Asphalt, gravel, concrete, and soil	5 cy	Sanitary	PK, radiological surveys, possible sampling and analysis of Bear Creek Road asphalt	ORRL disposal
Metal debris items (bollards, signs, guard rails, etc.)	1 cy	Sanitary	PK, radiological surveys, possible characterization for lead and PCBs in paint	ORRL disposal
Wood/concrete debris	5 cy	Sanitary	PK, radiological surveys	ORRL disposal
Hydraulic line spill cleanup material	< 1 cy	Sanitary	PK, radiological surveys	ORRL disposal
Associated secondary waste (PPE, plastic sheeting, rags, wipes, etc.)	< 1 cy	Sanitary	PK, radiological surveys	ORRL disposal
<b>Utilities Extension</b>				
Asphalt, gravel, concrete, and soil	5 cy	Sanitary	PK, radiological surveys	ORRL disposal
Wood power line poles	5-10 poles	Sanitary	PK, radiological surveys	ORRL disposal, need to be size-reduced to lengths less than 8 ft
Waste from electric utilities extension	< 1 cy	Sanitary	PK, radiological surveys	ORRL disposal
Waste items from electric utilities extension	< 1 cy	TBD	PK, radiological surveys	Provide to ETTP S&M Waste Coordinator for disposal (as needed)
Waste from potable water extension	< 1 cy	Sanitary	PK, radiological surveys	ORRL disposal; water lines need to be size reduced to lengths less than 8 ft
Hydraulic line spill cleanup material	< 1 cy	Sanitary	PK, radiological surveys	ORRL disposal
Associated secondary waste (PPE, plastic sheeting, tools, rags, wipes, etc.)	< 1 cy	Sanitary	PK, radiological surveys	ORRL disposal

**Table 1. Summary of waste stream characterization during ESP activities (cont.)**

<b>Waste stream</b>	<b>Expected volume</b>	<b>Expected waste type</b>	<b>Characterization basis</b>	<b>Comments</b>
<b>Initial Preparation of 7b Borrow Area</b>				
Hydraulic line spill cleanup material and associated secondary waste	< 1 cy	Sanitary	PK, radiological surveys	ORRL disposal
<b>Construction Support Area</b>				
Hydraulic line spill cleanup material and associated secondary waste	< 1 cy	Sanitary	PK, radiological surveys	ORRL disposal

EMWMF = Environmental Management Waste Management Facility  
 ESP = Early Site Preparation  
 ETP = East Tennessee Technology Park  
 ORR = Oak Ridge Reservation  
 PCB = polychlorinated biphenyl

PK = process knowledge  
 PPE = personal protective equipment  
 S&M = Surveillance and Maintenance  
 TBD = to be determined  
 Y-12 = Y-12 National Security Complex

## **6.2 UTILITIES EXTENSIONS**

Materials from existing utilities that are removed will be considered waste and will be appropriately managed. Expected or potential waste streams include the following:

- Asphalt, gravel, concrete, and/or soil from the burial of utilities and removal of utility poles
- Components from existing utilities removed during this activity (wooden utility poles, insulators, conduit, electrical wire, piping, etc.)
- Hydraulic line spill cleanup material (during utility excavation/installation)
- Associated secondary waste (PPE, plastic sheeting, tools, rags, wipes, etc.)

There is a potential for recycle of conductors (electrical wires); the Waste Coordinator will evaluate items for recycle in accordance with the applicable UCOR Waste Management procedures.

All of the waste from this activity is expected to be eligible for disposal in the ORRL. It is possible that some electrical equipment could be determined to be a hazardous waste as defined by RCRA. That waste (if any) will be managed consistently with other UCOR hazardous waste. The expected waste streams for this activity are listed in Table 1, including the expected volume, waste type(s), characterization basis, expected disposal outlet(s), and other relevant waste management information.

During the utilities extensions, it is assumed that unused materials from utility upgrades will be removed from the site by the subcontractor performing the work and will not be a waste stream managed during this activity. If it is disposed onsite, it will be disposed at the ORRL.

## **6.3 INITIAL PREPARATION OF BORROW AREA**

The use of hydraulic equipment assumes the possibility that hydraulic line cleanup material and associated secondary waste could be generated. This waste (if any) is expected to be eligible for disposal in the ORRL.

The expected waste streams for this activity are listed in Table 1, including the expected volume, waste type(s), characterization basis, expected disposal outlet(s), and other relevant waste management information.

During the initial borrow area preparation, it is assumed that unused materials from access road construction will be removed from the site by the subcontractor performing the work and will not be a waste stream managed during this activity. If it is disposed onsite, it will be disposed at the ORRL.

## **6.4 CONSTRUCTION SUPPORT AREA**

The use of hydraulic equipment assumes the possibility that hydraulic line cleanup material and associated secondary waste could be generated. This waste (if any) is expected to be eligible for disposal in the ORRL.

The expected waste streams for this activity are listed in Table 1, including the expected volume, waste type(s), characterization basis, expected disposal outlet(s), and other relevant waste management information.

During development of the Construction Support Area, it is assumed that unused materials from access road construction will be removed from the site by the subcontractor performing the work and will not be a waste stream managed during this activity. If it is disposed onsite, it will be disposed at the ORRL.

## 7. PROJECT ORGANIZATION AND SCHEDULE

### 7.1 PROJECT ORGANIZATION

The organizational structure for this project is presented in Fig. 6.

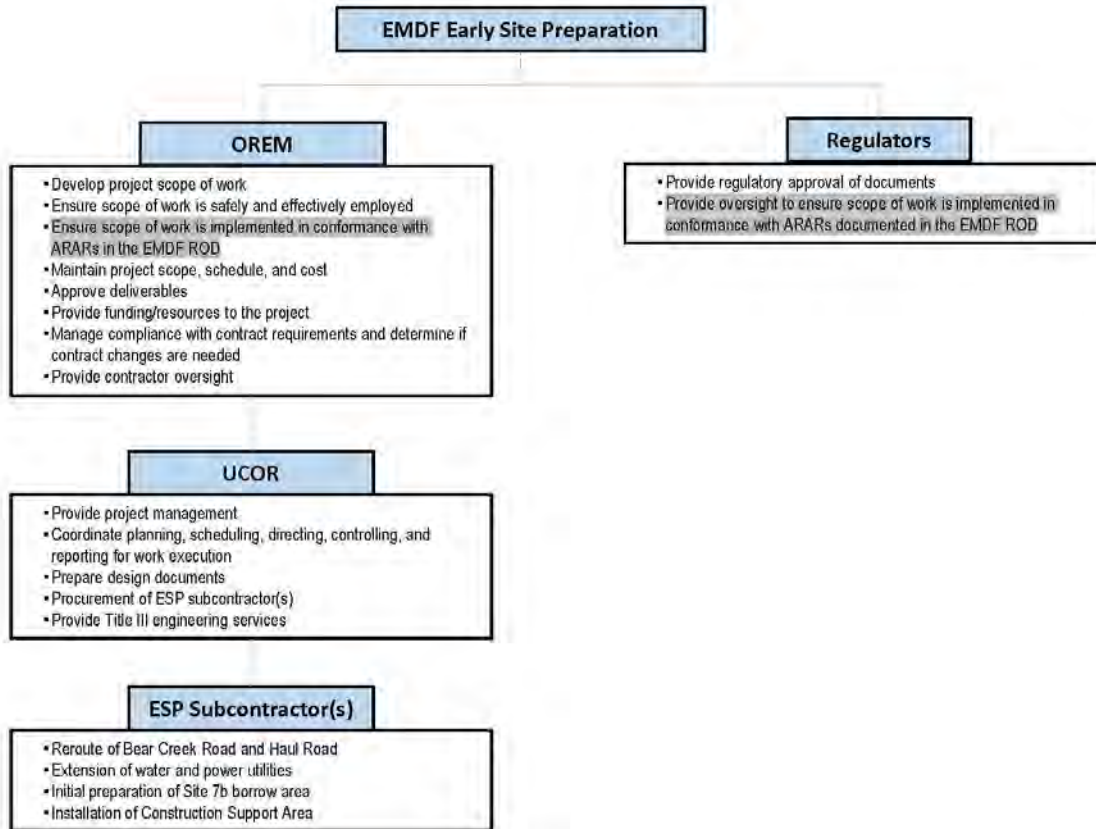


Fig. 6. EMDF ESP project organization.

#### 7.1.1 OREM

OREM is responsible for developing the project scope of work; ensuring the work scope is performed in a safe, compliant, and effective manner; and maintaining the project scope, schedule, and costs. OREM also is responsible for approving deliverables and providing funding/resources to the project.

The OREM Federal Project Director (or Deputy) is responsible for maintaining the overall scope, schedule, and costs. The OREM Contracting Officer (CO) and CO Representative are responsible for managing compliance with contract requirements and determining if changes to contracts are necessary or required. OREM staff, including subject matter experts and facility representatives, are responsible for providing general oversight of the contractor's safety and compliance performance.

### 7.1.2 Regulators

TDEC and EPA have review/approval authority over this scope through reviewing this RDR/RAWP under Federal Facility Agreement protocols.

### 7.1.3 UCOR

UCOR is responsible for working with OREM to develop the project scope of work; ensuring the work scope is performed in a safe, compliant, and effective manner; and maintaining the project scope, schedule, and costs.

UCOR will provide additional project management and support oversight for the project, which includes coordination of overall planning, scheduling, directing, controlling, and reporting for the execution of the work. UCOR has prepared the design documents for the road reroute, utilities extensions, borrow area preparations, and the installation of a Construction Support Area.

UCOR will procure services of construction subcontractor(s) for the ESP activities by preparing draft statements of work, technically reviewing proposals, answering questions, supplying design and site information, and supporting pre-bid meetings, tours, and site access.

UCOR will provide construction oversight for OREM. Oversight will include reviewing submittals, assisting with site access, providing field oversight, conducting construction completion walkdowns, and supporting construction closeout.

UCOR will provide Title III engineering services to OREM through the Engineer of Record (i.e., the designer). Title III services include maintaining records of design changes or requests for information, reviewing contractor and/or subcontractor submittals for conformance to design requirements, and preparing as-built documentation through the Engineer of Record. As such, the Engineer of Record will prepare and issue a final set of construction as-built drawings and specifications, incorporating any design changes.

## 7.2 PROJECT SCHEDULE

Key activities and dates for the ESP scope are presented in Table 2.

**Table 2. Key activities and dates for the ESP scope**

<b>Activity</b>	<b>Date</b>
ESP RDR/RAWP D1 submittal	December 2022
ESP Construction start	July 2023
ESP Construction finish	September 2024

Note: A future Landfill Construction Phased Construction Completion Report will include and document the ESP activities.

ESP = Early Site Preparation  
RDR/RAWP = Remedial Design Report/Remedial Action Work Plan

## 8. REFERENCES

- Cultural Resource Analysts, Inc. *Phase I Archaeological Survey of the Proposed Environmental Management Disposal Facility in Central Bear Creek Valley, Roane County, Tennessee*, Contract Publication Series 18-139, June 2018, Cultural Resource Analysts, Inc., Lexington, KY.
- DOE/OR/01-2695&D2/R1. *Proposed Plan for the Disposal of Oak Ridge Reservation Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Waste*, September 2018, U.S. Department of Energy, Oak Ridge Office of Environmental Management, Oak Ridge, TN.
- DOE/OR/01-2794&D2/R2. *Record of Decision for Comprehensive Environmental Response, Compensation, and Liability Act Oak Ridge Reservation Waste Disposal at the Environmental Management Disposal Facility, Oak Ridge, Tennessee*, September 2022, U.S. Department of Energy, Oak Ridge, TN.
- DOE/OR/01-2819&D1. *Technical Memorandum #2, Environmental Management Disposal Facility, Phase I Monitoring, Oak Ridge, Tennessee*, May 2019, U.S. Department of Energy, Oak Ridge Office of Environmental Management, Oak Ridge, TN.
- ORNL/TM-2015/248. *Bat Species Distribution on the Oak Ridge Reservation*, October 2015, Oak Ridge National Laboratory, Oak Ridge, TN.
- ORNL/TM-2018-515. *Natural Resource Assessment for the Proposed Environmental Management Disposal Facility (EMDF), Oak Ridge, Tennessee*, June 2018, Oak Ridge National Laboratory, Oak Ridge, TN.
- Robinson and Johnson 1995. *Results of a Seepage Investigation at Bear Creek Valley, Oak Ridge, Tennessee January – September 1994*, USGS Open-File Report 95-459, U. S. Geological Survey, Nashville, TN.
- TDEC 2012. *Tennessee Erosion and Sediment Control Handbook*, latest edition, Tennessee Department of Environment and Conservation, Nashville, TN.
- UCOR-5215. *Stormwater Management Requirements for Early Site Preparation for the Onsite Waste Disposal Facility, Oak Ridge, Tennessee*, latest revision, United Cleanup Oak Ridge LLC, Oak Ridge, TN.

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<b>Document Number:</b> DOE/OR/01-2934&D1	<b>Document Title:</b> Remedial Design Report/Remedial Action Work Plan for the Environmental Management Disposal Facility, Oak Ridge, Tennessee: Early Site Preparation Activities		
<b>Name of Reviewer:</b> Carl Froede	<b>Organization:</b> EPA	<b>Date Comments Transmitted:</b> 2-17-2023	

Comment No.	Sect/ Page	Comment	Response
<b>GENERAL COMMENTS</b>			
1		It is unclear if borrow soils from Site 7b will be utilized during site preparation activities. It is noted, the Phase 3 (Borrow Areas) Characterization Report for the Environmental Management Disposal Facility, Oak Ridge Tennessee dated September 2019 does not appear to be referenced in the RDR/RAWP. Please revise the RDR/RAWP to reference the aforementioned document, if applicable.	Clarification provided. The Early Site Preparation (ESP) scope for the initial preparation of the Site 7b borrow area is limited to construction of an access road and a staging area for parking heavy equipment (Sect. 4.3). There is no plan to use borrow soils from Site 7b during ESP. No change to the document is required.
2		The Executive Summary of the RDR/RAWP indicates that Early Site Preparation (ESP) activities will occur in uncontaminated areas, yet no environmental data or reports are summarized or referenced in this design. Please revise the RDR/RAWP to summarize or reference previously approved documents in the administrative record that report the areas where activities will occur are uncontaminated.	Clarification provided. The EMDF site was selected in an area that was not disturbed by previous ORR activities. No contamination was noted during the previous hydrogeological characterization phases. Because of these conditions, no characterization for contamination was required. As stated in the EMDF ROD (Sect. 2.2.1), the BCV Phase I ROD identified zones defined for setting cleanup goals. Zone 2, the location of the EMDF and ESP activities, also has no known contaminated sites.  Text in the first paragraph of Chap. 6 was revised as follows: "As summarized in Sect. 2.2.1 of the EMDF ROD, the EMDF site, including where the ESP activities will occur, is in an uncontaminated area of BCV; therefore, waste materials are expected to be disposed at the Oak Ridge Reservation Landfill."
3		The specifications included in Appendix A (Bear Creek Road and Haul Road Reroute Design Package), Appendix D (Initial Preparation of Site 7B Borrow Area Design Package), and Appendix E (Installation of Construction Support Area Design Documents) lack provisions to test, confirm or document that materials being used during ESP activities are free of chemical contamination. Examples include, but may not be limited to, the following: <ul style="list-style-type: none"> <li>• Specification for Section 31 00 00 Earthwork. Part 1: General, Section 1.02 Definition of Terms: The specification outlines what makes up Unsatisfactory Material. The definition does not preclude use of chemically contaminated material. The specification should include provisions to include any material that is chemically contaminated as</li> </ul>	<ul style="list-style-type: none"> <li>• Clarification provided. The EMDF project requires borrow material to be clean and free of contamination prior to receipt by the project. Quarried rock products are considered as clean material due to the nature of the material. No change to the specification is</li> </ul>

Comment No.	Sect/ Page	Comment	Response
		<p>Unsatisfactory.</p> <ul style="list-style-type: none"> <li>• Specification for Section 31 00 00 Earthwork. Part 2: Products, Section Sec 2.01 Materials, Paragraph A, B and D: The specification outlines site materials for construction imported or reused from onsite sources. All proposed materials should be free of chemical contamination. The specification should include that all fill materials used onsite shall be tested for chemical contamination prior to import.</li> <li>• Specification for Section 31 00 00 Earthwork. Part 2: Products, Section 2.01 Materials, Paragraph E: The specification states that construction water for moisture conditioning of the compacted fill shall be obtained from the onsite water source designated by the UCOR construction manager. There is a risk that the water source could be chemically contaminated. The specification should include the stipulation that all water sources be tested for contaminants prior to use onsite.</li> <li>• Specification for Section 31 00 00 Earthwork. Part 3: Execution, Section 3.01 Subgrade Preparation: The specification outlines that the sub grade topsoil shall be stripped and stockpiled. There is a slight risk that topsoil could be contaminated with pesticides or other chemicals. The specification should include provisions to test existing topsoil for chemical contamination prior to removal/stockpiling.</li> <li>• Specification for Section 32 12 00 Aggregate Materials. Part 2: Products, Section 2.01 Materials: The specification outlines requirements for imported aggregate materials. There is a risk that any imported materials could be chemically contaminated. The specification should include chemical testing prior to delivery to the site.</li> <li>• Specification for Section 32 12 00 Aggregate Materials. Part 2: Products, Section 2.01 Materials: The specification outlines requirements for imported aggregate materials. There is a risk that any recycled or reused aggregate material is contaminated. The specification should include chemical testing of any recycled or reused material prior to use for the site work.</li> </ul>	<p>required.</p> <p>Text was added to the first paragraph of Chap. 5 as follows: “Fill materials used for ESP activities will be clean and free of contaminants. Quarried rock products are considered as clean material due to the nature of the material.”</p> <ul style="list-style-type: none"> <li>• See above.</li> <li>• Clarification provided. City of Oak Ridge water is used for EMDF construction and throughout the ORR for construction, demolition, and remediation projects, not a potentially contaminated source. No testing is required.</li> <li>• See response to General Comment 2.</li> <li>• See Response to General Comment 3, first bullet.</li> <li>• See Response to General Comment 3, first bullet.</li> </ul>

Comment No.	Sect/ Page	Comment	Response
		Please review and revise the specifications to ensure, as noted above, that provisions to test, confirm or document the materials being used during ESP activities are free of chemical contamination are included.	See Response to General Comment 3, first bullet.
<b>SPECIFIC COMMENTS</b>			
1	Sect. 4 pg 13	<p>Remedial Design Report</p> <p>The sequencing of the five main ESP activities are not clearly defined in the RDR/RAWP. For example, Section 4 describes, in general, the five ESP activities; however, the sequencing of events is not defined. Please revise the RDR/RAWP to describe the order of events.</p>	<p>Clarification provided. Except for the road reroutes, these tasks are independent work activities. The sequence of these activities will depend on the availability of specialty subcontractors, equipment and materials. For the road reroutes, these two activities do not depend on each other except Bear Creek Road must be completed before the Haul Road can be completed.</p> <p>Text revised to add a statement to Chap. 4 that the ESP activities are independent work activities and that sequencing of ESP activities will be determined by the ESP subcontractor.</p>
2	Appendix B	<p>Extension of Electric Utilities Design Package, Drawing EY002-MVP-0134, 13.8KV Overhead Line, Extension Plan</p> <p>Clarity should be provided to certain areas of the Overhead (O/H) and poles layout presented on Drawing EY002-MVP-134. For example, the O/H Line between poles #K2748, #K2747 and #K2476 is shown as a dark line, which is the same as between the M4-XXX series poles. In addition, it is unclear if the O/H Line will be disconnected at tie pole #K2747 and will be reconnected after the existing tie pole is replaced with a new steel pole. Lastly, it is unclear if the existing O/H line conductor will be replaced if required to connect to the new pole. Please revise the drawing to add a note to clarify that the O/H line between these three poles is the existing O/H #4 CU conductor line; clarify if the O/H Line will be disconnected at tie pole #2747; and, clarify if the O/H line conductor will be replaced if required to connect to a new pole.</p>	<p>Clarification provided. The level of detail presented are sufficient to demonstrate the work being performed. This electrical design was accepted by the CNS Power Operations group as the electrical authority having jurisdiction. Consideration for additional notes will be made when as-built drawings are generated.</p> <p>To address specific comments:</p> <ul style="list-style-type: none"> <li>• Details for each pole are provided in the appropriate drawings.</li> <li>• The line from #K2746 to #K2747 and #K2478 will not be replaced.</li> <li>• Work performed by CNS Power Operations group is not included in the drawings and specifications, such as disconnecting the line from the old pole K2747 and connecting this to a new steel pole,</li> </ul> <p>No change necessary.</p>

Comment No.	Sect/ Page	Comment	Response
3	Appendix B	<p>Extension of Electric Utilities Design Package, Drawing EY002-MVP-0134, 13.8KV Overhead Line, Extension Plan</p> <p>Several pole numbers are not referenced on Drawing EY002-MVP-0134. For example, pole numbers to the three existing poles shown going to the Backflow Preventer Building are missing. Please revise Drawing EY002-MVP-0134 to reference the three noted existing poles.</p>	<p>Clarification provided. The labeling and level of detail presented are sufficient to demonstrate the work being performed. This electrical design was accepted by the CNS Power Operations group as the electrical authority having jurisdiction. Consideration for additional labeling will be made when as-built drawings are generated.</p> <p>Note: The three poles are not in scope for either the overhead line or the backflow preventer building design packages and are shown only for completeness.</p> <p>No change necessary.</p>
4	Appendix C	<p>Water Line Extension            Drawing E2E-OSWDF0-F307, Backflow Preventer Building, Electrical Site Plan and Details</p> <p>The following details are not provided on Drawing E2E-OSWDF0-F307:</p> <ul style="list-style-type: none"> <li>• The voltage of 480V and 1 PH power is not shown on the One Line Diagram.</li> <li>• In Section 'A' Elevation (pole #K5340), the new power feed is not clearly defined. For example, the definition states 'NEW 2 "POWER FEED', but does not include details (e.g., 480V, 1PH POWER FEED IN 2" CONDUIT).</li> <li>• In Section 'A' Elevation (pole #K5340), the description does not include the voltage for the meter.</li> <li>• In Section 'A' Elevation (pole #K5340), there is a note missing (e.g., Cap spare 2" spare conduit stub-up').</li> <li>• In Duct bank section 'C' and 'D', the spare conduit is not identified.</li> </ul> <p>Please revise Drawing E2E-OSWDF0-F307 to include the aforementioned details, as applicable.</p>	<p>Clarification provided. The labeling and level of detail presented are sufficient to demonstrate the work being performed. This electrical design was accepted by the CNS Power Operations group as the electrical authority having jurisdiction. Consideration for additional labeling and details will be made when as-built drawings are generated.</p> <p>No change necessary.</p>
5	Appendix C	<p>Water Line Extension            Drawing E2E-OSWDF0-F308, Backflow Preventer Building, Electrical Plan and Details</p> <p>The breaker size in panel schedule 'LP-1' is not provided on Drawing E2E-OSWDF0-F308. For clarity, please revise the drawing to add the appropriate breaker size in the panel schedule for LP-1.</p>	<p>Clarification provided. The labeling and level of detail presented are sufficient to demonstrate the work being performed. This electrical design was accepted by the CNS Power Operations group as the electrical authority having jurisdiction. Consideration for additional labeling will be made when as-built drawings are generated.</p> <p>No change necessary.</p>

Comment No.	Sect/ Page	Comment	Response
6	Appendix E	<p>Installation of Construction Support Area Design Documents            Drawing E2E-OSWDF0-F971, Construction Support Area Electrical Site Plan</p> <p>The following details are not provided on Drawing E2E-OSWDF0-F971:</p> <ul style="list-style-type: none"> <li>• The interior power service panel is missing information. Please add to the inside UCOR Construction Trailer an identification of the 120/240V Interior Power service panel, which is provided by the trailer vendor.</li> <li>• Information regarding pull boxes is not clear. If necessary between the U/G conduit run between Pole # M4-009 and the construction trailer power panel, include and show a drawing detail.</li> <li>• A reference is missing. Please add to note #4 a reference to CNS for 13.8 KV extension work, as shown on the One Line Diagram on Drawing E2E-OSWDF0-F972.</li> </ul> <p>Please revise Drawing E2E-OSWDF0-F971 to include the aforementioned details, as applicable.</p>	<p>Clarification provided. The labeling and level of detail presented are sufficient to demonstrate the work being performed. This electrical design was accepted by the CNS Power Operations group as the electrical authority having jurisdiction. Consideration for additional labeling will be made when as-built drawings are generated.</p> <ul style="list-style-type: none"> <li>• The trailer has not been procured; the service has been sized from similar trailers owned by UCOR</li> <li>• No pull boxes are anticipated.</li> <li>• The 13.8 kV OH Extension will be constructed by UCOR, as will the CSA electrical scope.</li> </ul> <p>No change necessary.</p>
7	Appendix E	<p>Installation of Construction Support Area Design Documents            Drawing C2E-OSWDF0-F956 Construction Support Area Site Layout and Grading Plan and            C2E-OSWDF0-F958, Construction Support Area Details and Sections</p> <p>The design drawings show a 6 inch aggregate base layer over an 8-ounce non-woven geotextile. Since construction equipment will be parked, fueled and maintained there, there is an increased risk of site contamination over the duration of the project. Please revise Appendix E to include a flexible membrane liner to minimize/isolate contaminant spread.</p>	<p>Clarification provided. UCOR's Environmental Management System Policy and implementation through the work control process requires immediate identification and mitigation of spills. This policy has been successfully implemented for multiple projects over the years, and the requirements are flowed down to the ESP subcontractor. UCOR will review and approve ESP subcontractor submittals for management of fuels, spill control and mitigation.</p> <p>Use of a flexible membrane liner provides no additional benefit over the current approach and presents additional problems with the water drainage.</p> <p>No change to the design drawings is required.</p>

<b>Document Number:</b> DOE/OR/01-2934&D1	<b>Document Title:</b> Remedial Design Report/Remedial Action Work Plan for the Environmental Management Disposal Facility, Oak Ridge, Tennessee: Early Site Preparation Activities		
<b>Name of Reviewer:</b> Randy Young		<b>Organization:</b> TDEC	<b>Date Comments Transmitted:</b> 1-23-2023

Comment No.	Sect/ Page	Comment	Response
<b>SPECIFIC COMMENTS</b>			
1	Sect. 1.1 pg 1 last para	Revise this one-sentence paragraph to clarify the early site preparation (ESP) activities are not associated with the design or construction of landfill elements, including wastewater management facilities, that will contain or treat contamination related to waste placed in the future landfill. In addition, note that ESP activities will protect public health and the environment through control of stormwater and associated sediment, avoidance and/or mitigation of impacts to threatened and endangered species, and compliance with other substantive requirements in the ROD.	Clarification provided. Text revised as suggested, except mitigation was not incorporated as this will be performed as part of the larger EMDF project.
2	Fig. 1 pg 3	Consider replacing the map with a sharper (less fuzzy) image. Consider including a full-page map, similar to Fig. 2.	Clarification provided. Figure included as a full-page image.
3	Sect. 2.2 pg 5 1 <sup>st</sup> para, 2 <sup>nd</sup> sent.	No document revision is needed in response to this question, but DOE’s response may inform planning for baseline and detection monitoring.  Are there sufficient bedrock wells along geologic strike between the Bear Creek Burial Grounds (BCBG) and the Environmental Management Disposal Facility (EMDF) site to support this statement? The cross section in Fig. E-10 in the D5 Remedial Investigation/Feasibility Study (RI/FS) shows shallow bedrock and deep bedrock wells screened in relevant rock units, although some are not completed as conventional monitoring wells—i.e., they have large open borehole intervals. The inset map on that figure does not show wells along strike west of the BCBG. RI/FS Fig. E-2 shows wells further west, but all seem to lie updip from the “DNAPL Area.”	Clarification provided. The existing dataset and information on the EMDF hydrogeologic setting, is sufficient to conclude that the EMDF is not located over existing groundwater contamination plumes. Please note, the ESP activities do not impact and are not expected to be impacted by groundwater.

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4	Sect. 2.2 pg 5 2 <sup>nd</sup> para	<p>It is unclear whether all 32 piezometers have been monitored since 2018. Revise this paragraph for accuracy if warranted.</p> <p>Technical Memorandum 2 (TM-2) documents the installation and monitoring of 16 “Phase 1” piezometers in 2018. Although the TM-2 transmittal letter forecasts delivery of Technical Memorandum 3 (TM-3) in August 2019 to document Phase 2 data, TDEC has not found that TM-3 was ever submitted.</p>	<p>Clarification provided. The piezometers have been monitored for groundwater elevation since 2018, no change to the text is needed.</p> <p>TM-3 was not submitted. However, DOE has previously provided the relevant information on the piezometers. The Phase 2 data expected to be reported in TM-3 is primarily data that will be used for the design and will be submitted as part of the RDR/RAWP for the landfill instead of a standalone TM.</p>
5	Sect. 2.3 pg 5 1 <sup>st</sup> para, last sent	Delete “both shallow and deeper” unless geochemical or other data support the discharge of deep groundwater at EMDF. If the statement is supported, provide the explanation and clarify the apparent inconsistency with the last sentence in Section 2.3.	Clarification provided. Additional information is available on distinguishing between shallow vs deeper groundwater using field parameters as described in TM-2. However, this information is not relevant to the ESP activities. Therefore, “both shallow and deeper” has been deleted.
6	Sect. 2.4 pg 7 (also pgs F-6, F-15, F-20)	<p>Wetland delineations</p> <ol style="list-style-type: none"> <li>a. In accordance with the state’s ARAP program, wetland impacts exceeding 0.1 acre fall under individual ARAP coverage thereby requiring compensatory mitigation. Revise the text to acknowledge this requirement and note that ESP impacts will be tracked as part of the cumulative impacts associated with subsequent phases of work, including landfill construction, and mitigated as required. Add similar acknowledgements as appropriate on pages F-6, F-15, and F-20.</li> <li>b. Cite Fig. 3 at the end of the sentence that mentions 17 wetlands and improve the visibility/contrast of the wetlands on the maps in Figs. 3, F.1, and F.2. Alternatively, consider adding a separate map that shows the wetlands more clearly.</li> <li>c. Add text directing the reader to Fig. F.3 for a map of potential wetland impacts.</li> <li>d. Clarify the “road reroute section” cited in the second paragraph on Page 7 and the “Road Reroute section” cited in the last paragraph of Page F-16 refer to the section called “Reroute of Bear Creek Road and Haul Road” in Appendix F, Section F.4.2 (Page F-11). This appears to be the only part of the document that provides</li> </ol>	<ol style="list-style-type: none"> <li>a. Agree. Text was added to Sect. 2.4 and F.5 as follows: “Mitigation requirements for the ESP scope will be tracked as part of the cumulative impacts from the EMDF project and mitigated as required.”</li> <li>b. Agree. Text revised as suggested to cite Fig 3 where the 17 acres of wetlands are shown.</li> <li>c. Agree. Appendix F text revised as suggested (refers to Fig. F.2).</li> <li>d. Agree. Text revised as suggested</li> </ol>



Comment No.	Sect/ Page	Comment	Response
		additional description.	
7	Sect. 2.4 pg 7	<p>Stream surveys</p> <p>As noted in this section, the project lies in a watershed with a thriving population of Tennessee dace, which the state lists as “in need of management.” Although Tennessee dace were not observed during the brief onsite surveys, consider rewording this section (and similar language in Appendix F) to indicate the stormwater controls will protect this species in streams that may be impacted by ESP activities.</p>	Agree. Text revised as suggested.
8	Sect. 2.4 pg 7 (also pgs F-6, F-13, F-16)	<p>Timber assessments</p> <p>The document discusses the lack of a recent timber inventory and cites a map in a 2018 report.<sup>1</sup> That map and related text indicate part of the ESP area was assessed for timber in 2014 and 2015.<sup>2</sup> The document under review, the Remedial Design Report/Remedial Action Work Plan (RDR/RAWP) for ESP activities, summarizes the historical timber inventory, stating that relatively short loblolly pine trees provide the dominant forest cover, consistent with timber harvesting in 2000. Other parts of the document (e.g., p. 8 and p. F-7) suggest that rare species are not typically found in areas that were harvested 23 years ago.</p> <p>Rather than relying on such assumptions, DOE should survey ESP areas for the potential presence of sensitive species known or suspected to be in the area before beginning ESP activities. TDEC’s rationale for this recommendation includes the following.</p> <p>First, as noted in Comment 9a, there is some uncertainty whether loblolly pines provide roosting habitat for bats. As noted below, the ROD addresses requirements for compliance with the ESA.</p> <p>Second, the forest composition may be more complex than suggested by the RDR/RAWP summary. The 2014-2015 inventory documents at least 36 tree species, although it is unclear how these species are distributed within the ESP area.<sup>3</sup> Ten trees measured at sample points in the area had diameters at breast height (dbh, or 4.5 feet above ground) of 30 inches or more, including a 38-inch chestnut oak.</p> <p>More than half the basal area was covered with trees that had dbh measurements of 10 inches or greater. These larger trees included tulip poplar, white oak, red maple, and sweet gum. Saplings, or trees</p>	<p>Clarification provided. The text was revised to indicate that the timber inventory completed in 2014 was used to provide additional data to supplement the timber assessment in 2018. In addition, rare species assessments were conducted as part of the 2018 surveys.</p> <p>Clarification provided. Recent walkdown with ORNL Natural Resources bat SME identified less than 50 potential bat roosting trees in the ESP areas. This information was added to the text.</p> <p>See response to first paragraph above concerning the timber assessment.</p> <p>Clarification provided. The 2018 timber assessment noted the presence of primarily loblolly pines in the ESP areas. The information provided in the comment</p>

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		<p>between 2 and 10 inches dbh, included red maple, sweet gum, tulip poplar, sourwood, and dogwood, in addition to loblolly pine.</p> <p>Third, neither the 2018 natural resource report nor the RDR/RAWP for ESP clearly document that sensitive species, including four-toed salamanders or other mobile species, have not migrated or reinhabited the ESP area in the 23 years since the last timber harvest.</p> <p><sup>1</sup> <i>Natural Resource Assessment for the Proposed Environmental Management Disposal Facility (EMDF), Oak Ridge, Tennessee (ORNL/TM-2018/515).</i></p> <p><sup>2</sup> The natural resource assessment states a 33-acre area of timber within the EMDF site south of Bear Creek Road has not been inventoried recently.</p> <p><sup>3</sup> <i>Fraxinus</i> (ash) was only identified to genus, not species.</p>	<p>pertains to trees higher on Pine Ridge.</p> <p>Clarification provided. As described, sweeps for four-toed salamanders will be conducted to remove sensitive resources in advance of project activities.</p>
9	pg 8 2 <sup>nd</sup> para (also pgs F-6, F-13, F-16, F-20)	<p>Rare species surveys</p> <p>a. TDEC understands the area to be cleared during ESP is forested primarily by loblolly pine trees, but there is uncertainty whether they provide roosting habitat for bats. A 2022 U.S. Fish &amp; Wildlife Service (USFWS) report states bats are flexible in selecting tree species, noting adult females form maternity colonies in many tree species with suitable cavities or bark.<sup>4</sup> The report states factors such as forest successional patterns and stand/tree structure are more crucial than tree species for determining roosting habitat.</p> <p>The ROD addresses DOE duties for compliance with the ESA, particularly with respect to several species of bats. Activities during the RD/RA phase of a remedial action must be consistent with the terms and scope of the ROD. The Species Status Assessment (SSA) report cited in the previous paragraph addresses the northern long-eared bat (NLEB). The SSA is not a regulatory document and only provides guidance. When the ROD was signed, the NLEB was list as “threatened,” but a rulemaking was already in process to “uplist” the species. Now the final rule has been published and will become effective at the end of January 2023.<sup>5</sup> The final rulemaking itself, 87 FR 73488, determines the enforceable legal restrictions that apply to the species in its new status as an endangered species. These requirements are outlined at the end of the final rule, 87 FR 73488-73502-3 (November 30, 2022).</p> <p>For this reason, TDEC strongly urges DOE to complete necessary tree removal during the winter, i.e., by mid-March, when bats are</p>	<p>Clarification provided. Recent walkdown with ORNL Natural Resources bat SME identified less than 50 potential bat roosting trees in ESP area. Informal consultation with USF&amp;WS determined there will be no adverse impact.</p> <p>No response required.</p> <p>Clarification provided. DOE has completed the</p>

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		<p>less likely to roost in these areas. As recommended in TDEC’s <i>Acoustic Survey of Bats at the Proposed EMDF Site</i> (transmitted to DOE on February 28, 2017):</p> <p style="padding-left: 40px;">The USFWS has published a framework suggesting timber removal at a project site should only occur during the fall/winter season (bat hibernation period). In other words, trees should not be harvested during spring/summer season when bats are using trees (and forests) for foraging, roosting, and while females are raising their young....</p> <p>The 2022 USFWS report finds the spring migration period, when adult female bats move from caves to forests, typically begins in mid-March. The females and their young migrate back to the winter caves by mid-October. The report notes variation in the onset and duration of these migrations is based on latitude and weather; the timing may vary by location and annual weather patterns.</p> <p>As noted in the USFWS report, bats may be affected directly by removal of occupied roost trees and loss of roosting and foraging habitat. Moreover, removal of occupied roosts during spring, summer, and fall is likely to injure or kill bats. This is particularly likely during cool spring months when bats enter torpor and when flightless pups or inexperienced flying juveniles are present.</p> <p>It is TDEC’s understanding that of the final rule, 87 FR 73488-73502-3 (November 30, 2022) addresses activities that will and will not violate the prohibitions of the ESA. Further, it is TDEC’s understanding that, as required by the ROD, DOE has begun the consultation process with the USFWS. TDEC expects the ROD will be followed, as required by 40 CFR 300.435, but consultation and subsequent USFWS guidance can provide further clarification as to permissible activities and date restrictions for conducting these activities.</p> <p>b. Page F-13 (third paragraph) and Page F-16 (second and last paragraphs) include text stating, “tree removal is likely to be performed during the winter/early spring when bats would not be roosting in these areas.” Spring begins March 20, so tree removal during early spring is not consistent with the recommendation to complete tree removal during the winter, i.e., by mid-March.</p>	<p>removal of bat roosting trees in the ESP areas by March 31, 2023, as agreed to with the USF&amp;WS.</p> <p>Agree.</p> <p>b. Clarification provided. This text was revised to state the trees were removed by March 31, as agreed to by the USF&amp;WS, and includes a reference to the new Attachment F.1.</p>

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		<p>c. TDEC advises caution regarding statements about the “minimal presence” of certain bat species. (Similar language is used on Page F-6.) DOE bat surveys identified fewer calls associated with the northern long-eared bat (<i>Myotis septentrionalis</i>), the Indiana bat (<i>Myotis sodalists</i>), and eastern small-footed bat (<i>Myotis leibii</i>). However, DOE and TDEC surveys identified three other bat species listed federally as threatened or endangered or state-listed as “in need of management,” including the gray bat (<i>Myotis grisescens</i>), little brown bat (<i>Myotis lucifugus</i>), and tricolored bat (<i>Perimyotis subflavus</i>).</p> <p>As documented in TDEC’s <i>Acoustic Survey of Bats at the Proposed EMDF Site</i> (transmitted to DOE on February 28, 2017), automated bat identification software identified 14 bat species based on more than 16,000 bat calls recorded over approximately one month throughout the area of the planned EMDF. TDEC’s survey was completed outside the USFWS-recommended monitoring period for Indiana bat surveys (May 15 through August 15), and TDEC recommended DOE conduct additional surveys during the recommended timeframe.</p> <p>DOE completed additional surveys during the recommended timeframe in July/August 2017 and May 2018.<sup>1</sup> As described above, the DOE surveys identified six listed bat species, some of which were detected more frequently than others. However, the DOE surveys focused on the northern parts of the planned landfill and adjacent borrow area and collected little data in the area where ESP activities will occur. Only two stations were located south of the Haul Road, both of which were south of Bear Creek Road.</p> <p>Collectively, DOE and TDEC surveys indicate several listed bat species are present in the EMDF area, at least during portions of the spring and summer. Therefore, great care is warranted to ensure compliance with the ESA.</p> <p><sup>4</sup> USFWS, 2022, <i>Species Status Assessment Report for the Northern long-eared bat (Myotis septentrionalis)</i>, Version 1.2, U.S. Fish and Wildlife Service, Great Lakes Region, Bloomington, Minnesota, August.  <sup>5</sup> This web page contains links to the final rulemaking published on November 30 (87 FR 73488) and links to other material about the NLEB:  <a href="https://www.fws.gov/species/northern-long-eared-bat-myotis-septentrionalis">https://www.fws.gov/species/northern-long-eared-bat-myotis-septentrionalis</a>.</p>	<p>Clarification provided. A large population was not noted during EMDF project surveys; however, the text has been revised to state that there does not appear to be a large population.</p> <p>Clarification provided. While no more surveys will be conducted, steps have been taken to reduce potential impacts to bat populations as described in Sect. F.2.</p>

Comment No.	Sect/ Page	Comment	Response
10	Sect. 2.4 pg 8 3 <sup>rd</sup> para	<p>Rare species surveys</p> <p>a. The third and fourth sentences indicate the ESP area contains state-listed fauna, including “the highest densities of four-toed salamander breeding sites known on the ORR.” DOE should revise the text to state it will notify TDEC’s Division of Natural Areas and the Tennessee Wildlife Resources Agency (TWRA) of known or anticipated impacts to state-listed fauna. This is consistent with the approach taken by DOE during construction of the Stable Isotope Production and Research Center (SIPRC).<sup>6</sup> As stated on Page 3-13 of the Environmental Assessment for that project:</p> <p style="padding-left: 40px;">DOE and ORNL also consulted with the TDEC Division of Natural Areas and the TWRA concerning potential impacts to state-listed fauna and sensitive or rare habitat within or directly adjacent to the SIPRC area of disturbance. Responses from these agencies are provided in (Appendix C). In accordance with TWRA suggestions, species sweeps were conducted in spring 2022 to document and potentially move any four-toed salamanders to a safe distance from the proposed area of disturbance. No four-toed salamanders or four-toed salamander nests were found within the proposed disturbance area. Four nests were found outside of the disturbance area and were flagged for protection. Preservation, enhancement, or restoration of Wetland C could also mitigate potential impacts to the state-listed four-toed salamanders that occur within the wetland.</p> <p>b. The last sentence states ESP activities will avoid habitats for four-toed salamanders (including breeding sites), wood thrushes, tubercled rein orchids, American ginseng, and pink lady’s slippers. Based on the natural resource assessment area outlined in Fig. 3, it appears construction of the landfill and support facilities will eventually impact these important habitats. Consider adding a sentence indicating which future documents will address these impacts. Alternatively, this information could be added to (or after) the last sentence in</p>	<p>Clarification provided. Text was added to state TWRA and TDNA will be notified. However, formal consultation was not required.</p> <p>As stated in App. F, sweeps will be conducted to document and relocate sensitive resources such as the four-toed salamander.</p> <p>b. Agree. The text revised as suggested.</p>

Comment No.	Sect/ Page	Comment	Response
		<p>Section 2.4. Similar wording should be added in Section F.4.2.</p> <p><sup>6</sup> <i>Environmental Assessment, Construction and Operation of the Stable Isotope Production and Research Center, Oak Ridge National Laboratory, Oak Ridge, Tennessee</i> (DOE/EA-2136).</p>	
11	Sect. 2.5 pg 8 1 <sup>st</sup> para, last sent	<p>Cultural resources</p> <p>The text states DOE intends to avoid and preserve the Douglas Chapel Cemetery. If it becomes necessary to relocate the cemetery, DOE must consult with the Tennessee Historic Cemetery Preservation Program (THCPP). Contact information and guidance is available at <a href="https://www.tn.gov/historicalcommission/state-programs/tennessee-historic-cemetery-preservation-program.html">https://www.tn.gov/historicalcommission/state-programs/tennessee-historic-cemetery-preservation-program.html</a></p>	Clarification provided. As stated, the EMDF project avoids Douglas Chapel Cemetery.
12	Sect. 4.2.2 pg 14 5 <sup>th</sup> para, last sent	<p>For consistency, consider replacing “Onsite Waste Disposal Facility” with “Environmental Management Disposal Facility.” In addition, note that EMDF is also known as the “Onsite Waste Disposal Facility” in the acronym list and/or first uses in the text on Pages ES-1 and 1.</p>	Agree. Text revised as suggested.
13	Sect. 5 pg 17 1 <sup>st</sup> , 2 <sup>nd</sup> , 3 <sup>rd</sup> para	<p>The document asserts a monitoring plan is not required because ESP activities consist of new construction in a clean area. TDEC agrees it is not necessary to monitor for most contaminants typically found on Oak Ridge Reservation (ORR) demolition and environmental remediation sites. However, TDEC asserts stormwater monitoring is required, as explained in the following.</p> <p>a. Rules and regulations cited as ARARs in the ROD require stormwater management controls to ensure compliance with the terms and conditions of <i>General Permit No. TNR050000</i> (“Stormwater Multi-Sector General Permit for Industrial Activities”). ARARs also require construction management techniques to ensure stormwater discharge is managed properly, including without limitation the requirements in <i>General Permit No. TNR100000</i> (“General NPDES Permit for Storm Water Discharges Associated with Construction Activity”). These requirements include complying with water quality criteria in TDEC 0400-40-03-.03, including prevention of discharges that impair the usefulness of waters of the state for any designated uses by TDEC 0400-40-04. These requirements also prohibit the following in receiving streams.</p>	<p>a. Clarification provided. The requirements under the <i>General Permit No. TNR100000</i> (“General NPDES Permit for Storm Water Discharges Associated with Construction Activity”) included as TBCs in the EMDF ROD ARARs table and discussed in this comment are met through best management practices in the Stormwater Management Requirements document (UCOR-5215) when conducting construction activities as outlined in the EMDF Early Site Prep RDR/RAWP. Minimization of the discharge of pollutants, as well as compliance with the prohibitions in the General Permit are assured and demonstrated by the proper operation of BMPs (stormwater controls)</p>

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		<ul style="list-style-type: none"> <li>• Floating scum, oil, or other matter</li> <li>• Objectionable color contrasts</li> <li>• Materials in concentrations sufficient to be hazardous or detrimental to humans, livestock, wildlife, plant life, or fish and aquatic life.</li> <li>• Discharges that would cause measurable degradation of waters with unavailable parameters.</li> </ul> <p>Compliance with these ROD requirements is ensured through monitoring, which is, therefore, a substantive requirement of the ROD. Submittal of reports/forms specified in the General Permit is administrative and, therefore, not required under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA).</p> <p>b. The Remedial Action Work Plan section incorporates the following document by reference: <i>Stormwater Management Requirements for Early Site Preparation for the Onsite Waste Disposal Facility, Oak Ridge, Tennessee</i> (UCOR-5215). During December 2022, DOE provided an updated version (R1) of that document to support TDEC review of the RDR/RAWP. Since that document supports the RDR/RAWP, a primary Federal Facility Agreement (FFA) document, DOE should post the updated (R1) version of UCOR-5215 at the DOE Information Center.</p> <p>c. The UCOR-5215 document does not address all the necessary components of the necessary stormwater monitoring. Therefore, revise the RAWP section of the RDR/RAWP to include the following.</p> <ul style="list-style-type: none"> <li>i. Information regarding where daily precipitation data is obtained</li> <li>ii. Define the sources and guidelines for environmental monitoring of stormwater effluent. Although they apply to demolition work in the Oak Ridge National Laboratory (ORNL), UCOR-5414 and UCOR-5390 appear to provide good examples for doing this.</li> <li>iii. Include pre-construction (site-preparation) environmental monitoring consisting of:             <ul style="list-style-type: none"> <li>1. At least two baseline samples need to be obtained, at least one month apart, prior to the start of any demolition</li> </ul> </li> </ul>	<p>as confirmed by the periodic inspection of the BMPs as outlined in the Stormwater Management Requirements document. The terms of the “General NPDES Permit for Storm Water Discharges Associated with Construction Activity” does not require the analytical monitoring of stormwater. The requirements of the General Permit No. TNR050000 (“Stormwater Multi-Sector General Permit for Industrial Activities”) would not apply until the facility is constructed and operational, as indicated in the EMDF ARARs table in the ROD.</p> <p>b. Agree. UCOR-5215 will be provided to the DOE Information Center.</p> <p>c. See the response to Comment 13a.</p>

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		<p>activities.</p> <p>2. Location of sampling sites needs to be provided.</p> <p>3. Potential pollutants need to be identified and reported.</p> <p>iv. The construction initiation period should include:</p> <p>1. Once construction work has started, stormwater monitoring should be conducted during qualifying precipitation events. A qualifying event is defined as a rain event that (1) produces 1 inch or more of measured rainfall within a 24-hour period; 2) causes runoff toward the outfall; and/or 3) occurs after a dry period, defined as no measurable rainfall (i.e., &lt; 0.1 inch) within a 72-hour period).</p> <p>2. Sampling frequency will be determined by designers. It is recommended to monitor quarterly, or after any significant activities that may directly or indirectly cause water quality issues.</p> <p>v. A final monitoring event should be performed after the conclusion of the project.</p> <p>vi. Sampling locations (outfall, catch basin, near stream, etc.) need to be identified on the site map.</p> <p>d. As stated in TDEC’s October 21, 2022 comments on the <i>Field Sampling Plan for Baseline Groundwater and Surface Water Characterization at the Proposed Environmental Management Disposal Facility, Oak Ridge Tennessee</i> (DOE/OR/01-2812&amp;D1):</p> <p>Baseline sampling should begin as soon as possible. Ideally, sampling would begin before significant land disturbance associated with site preparation or the planned groundwater field demonstration. In any case, the likelihood that dry wells and/or streams will prevent sampling during some events should drive a timely start to ensure development of a statistically meaningful baseline data set before landfill operations begin.</p>	<p>d. Clarification provided. Per the ROD (Sect. 2.12.2.7), baseline groundwater conditions must be documented before disposal facility operations begin, with results from at least four consecutive quarters of water quality sampling and analysis to establish baseline water quality that will be used as the basis for future monitoring.</p>
14	Sect. 6 pg 19 1 <sup>st</sup> para, last sent	Add text stating DOE will notify TDEC and the U.S. Environmental Protection Agency (EPA) if potential or actual contamination is discovered or generated during ESP activities.	Agree. Text revised as suggested.



Comment No.	Sect/ Page	Comment	Response
15.	Sect. 7.1.2 Fig. 6 pg 23	a. Under <i>OREM</i> , add the following text.  <i>Ensure scope of work is implemented in conformance with ARARs in the ROD.</i>  b. Under <i>Regulators</i> , add the following text.  <i>Provide oversight to ensure scope of work is implemented in conformance with ARARs documented in the ROD.</i>	Agree. Text revised as suggested.
16	Sect. 7.2 Table 2 pg 24	The schedule indicates much of the ESP work will occur during the winter wet season. Therefore, another section of the document should describe how DOE will respond to high-intensity rainfall, flash flooding, and excess stormwater that will need to be managed during such events.	Clarification provided. The following text was added in Chap. 5: “The ESP design is based on runoff from a 25-year, 24-hour storm and considers the runoff from a 100-year, 24-hour storm. Erosion control is in accordance with the ESP Stormwater Management Requirements document; sediment and erosion control measures are designed in accordance with the EMDF ROD ARARs, including guidance presented in the <i>Tennessee Erosion and Sediment Control Handbook</i> .”
17	Sect. F.4.2 pg F-11 last para, last sent	TDEC understands DOE is consulting with the USFWS, as required by Section 7 of the ESA, to ensure ESP and landfill construction are performed in a manner that will not jeopardize the continued existence of listed species. TDEC supports this consultation and requests acknowledgement in the text the ESP will be carried out in accordance with USFWS guidance and recommendations.	Agree. The USFWS consultation summary and results are included in the D2 version of Appendix F.
18	pg F-14 1 <sup>st</sup> para, last sent	As documented during site characterization, DOE determined Northern Tributary 10 (NT-10), Drainage 10W (D-10W), and NT-11 are streams. <sup>7</sup> DOE must engage a certified Qualified Hydrologic Professional (QHP), as defined in TDEC 0400-40-17, to complete stream determinations for the unnamed drainage, NT-9, and any other channels that will receive stormwater drainage from culverts to be installed during ESP activities.  For features determined to be streams, the planned work must meet substantive requirements of the ARAP program in accordance with the ROD. For features determined to be wet-weather conveyances, there are no such requirements. In that case, TDEC would simply advise DOE to implement standard erosion and sediment control best management practices (BMPs).  Either way, it is important to document the determination for future	Clarification provided. The streams in the ESP area are considered streams for the purposes of ARAR compliance. These waterways will be protected as such.

Comment No.	Sect/ Page	Comment	Response
		<p>reference. TDEC recommends submitting the determination to the Division of Water Resources (DWR). The DWR stores hydrologic determinations and provides an online viewer to minimize the need to reinvestigate a waterbody status in the future.</p> <p><sup>7</sup> See p. 10 in the <i>Phase 1 Field Sampling Plan for the Proposed Environmental Management Disposal Facility for Comprehensive Environmental Response, Compensation, and Liability Act Oak Ridge Reservation Waste Disposal, Oak Ridge, Tennessee</i> (DOE/OR/01-2739&amp;D2).</p>	
19	Appendices A, C, D, and E	<p>Technical specifications in these appendices include references to a Storm Water Pollution Prevention Plan (SWPPP). TDEC understands these citations refer to a document called <i>Stormwater Management Requirements for Early Site Preparation for the Onsite Waste Disposal Facility, Oak Ridge, Tennessee</i> (UCOR-5215/R1, November 2022). Clarify this by correcting the citations or adding a note in the body and/or references section of the RDR/RAWP.</p>	<p>Agree. The following text has been added to the first paragraph of Chap. 4: “Note that the design packages include references to a Storm Water Pollution Prevention Plan; these citations refer to the <i>Stormwater Management Requirements for Early Site Preparation for the Onsite Waste Disposal Facility, Oak Ridge, Tennessee</i> (UCOR-5215/R1).”</p>



## Department of Energy

Oak Ridge Office of Environmental Management  
P.O. Box 2001  
Oak Ridge, Tennessee 37831

April 11, 2023

Ms. Samantha Urquhart-Foster  
Superfund and Emergency Response Division  
U.S. Environmental Protection Agency  
Region 4  
Atlanta Federal Center  
61 Forsyth Street  
Atlanta, Georgia 30303-8960

Mr. Randy C. Young  
State of Tennessee  
Department of Environment and Conservation  
Division of Remediation – Oak Ridge  
761 Emory Valley Road  
Oak Ridge, Tennessee 37830-7072

Dear Ms. Urquhart-Foster and Mr. Young:

***SUBMITTAL OF THE FINAL REMEDIAL DESIGN REPORT/REMEDIAL ACTION WORK PLAN FOR THE ENVIRONMENTAL MANAGEMENT DISPOSAL FACILITY, OAK RIDGE, TENNESSEE: EARLY SITE PREPARATION ACTIVITIES (DOE/OR/01-2934&D2)***

In accordance with the *Federal Facility Agreement for the Oak Ridge Reservation* (FFA), the U.S. Department of Energy (DOE) submits the subject Remedial Design Report/Remedial Action Work Plan for your approval and signature. The enclosed document has been revised to incorporate comments received from the U.S. Environmental Protection Agency (EPA) and Tennessee Department of Environment and Conservation.

Note that due to file size and based on a previous request from EPA, the subject document and Appendices A through F are being electronically delivered as individual files (Enclosures 1 through 3, Appendices A through F). Also enclosed are the responses to EPA and Tennessee Department of Environment and Conservation comments on the D1 version of the document.

In accordance with the Review Cycle Protocol in the FFA for the Oak Ridge Reservation for primary documents, comments or approval are required within 30 calendar days of the DOE transmittal of April 6, 2023. However, by agreement between the FFA parties, an expedited review of the document is being requested.

Comments or approval are requested by April 21, 2023. If the D2 primary document cannot be approved within the approval period protocol for this document, DOE declares this document to be in informal dispute, consistent with FFA protocol under Section XXX, *Extensions*.

**SUBMITTAL OF THE FINAL REMEDIAL DESIGN REPORT/REMEDIAL ACTION WORK PLAN FOR THE ENVIRONMENTAL MANAGEMENT DISPOSAL FACILITY, OAK RIDGE, TENNESSEE: EARLY SITE PREPARATION ACTIVITIES (DOE/OR/01-2934&D2)**

If you have any questions or if we can be of further assistance, please contact Brian Henry at (865) 241-8340 or Roger Petrie at (865) 316-4063.

Sincerely,

**Brian Henry**

Digitally signed by Brian Henry  
Date: 2023.04.10 13:16:58  
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Brian T. Henry  
Portfolio Federal Project Director

**Roger B. Petrie**

Digitally signed by Roger B.  
Petrie  
Date: 2023.04.06 09:40:16 -04'00'

Roger B. Petrie  
Federal Facility Agreement Project Manager

Enclosures:

1. *Remedial Design Report/Remedial Action Work Plan for the Environmental Management Disposal Facility, Oak Ridge, Tennessee: Early Site Preparation Activities (DOE/OR/01-2934&D2)*
2. U.S. Environmental Protection Agency Comment Resolution Form
3. Tennessee Department of Environment and Conservation Comment Resolution Form

cc w/enclosures:

Cathy Amoroso, EPA Region 4  
Jana Dawson, EPA Region 4  
Carl Froede, EPA Region 4  
SSAB  
Brad Stephenson, TDEC, Oak Ridge

cc w/o enclosures:

Mark Maki, Pro2Serve  
Jennifer Linton, UCOR  
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