

# COVENANT DEFERRAL REQUEST

**FOR THE PROPOSED TITLE TRANSFER  
OF THE FORMER POWERHOUSE, DUCT ISLAND,  
AND K-1007-P1 POND AREA AT THE  
EAST TENNESSEE TECHNOLOGY PARK,  
OAK RIDGE, TENNESSEE**

**DRAFT FOR PUBLIC REVIEW**

**February 2016**



This document is approved for public release per review by:

*Susan D. Fawcett*      9/8/15  
ETTP Classification and Information      Date  
Control Office



**Table of Contents**

Acronyms ..... v  
Introduction ..... 1  
1.0 Property Description ..... 6  
2.0 Nature/Extent of Contamination ..... 13  
    2.1 Evaluation of Potential Contamination in the Former Powerhouse Area,  
        Duct Island, and K-1007-P1 Pond Area ..... 16  
    2.2 ETTP Soil and Groundwater Contamination ..... 17  
    2.3 ETTP Building Demolition Activities ..... 18  
3.0 Analysis of Intended Land Use During the Deferral Period ..... 19  
4.0 Risk Evaluation Results ..... 19  
    4.1 Vapor Intrusion Pathway Evaluation ..... 26  
5.0 Response/Corrective Action and Operation and Maintenance Requirements ..... 27  
6.0 Contents of Deed/Transfer Agreement ..... 30  
    6.1 Background Introduction ..... 31  
    6.2 Selected Excerpts from the Draft Quitclaim Deed Related to Protection of  
        Human Health and the Environment ..... 32  
7.0 Responsiveness Summary ..... 49  
    7.1 Regulator Comments ..... 49  
    7.2 Public Comments ..... 90

**List of Attachments**

ATTACHMENT A – ENVIRONMENTAL BASELINE SURVEY REPORT FOR THE PROPOSED TITLE TRANSFER OF THE FORMER POWERHOUSE, DUCT ISLAND, AND K-1007-P1 POND AREA AT THE EAST TENNESSEE TECHNOLOGY PARK, OAK RIDGE, TENNESSEE



## Acronyms

ACM	asbestos-containing material
bgs	below ground surface
BORCE	Black Oak Ridge Conservation Easement
CDR	Covenant Deferral Request
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act of 1980
<i>CFR</i>	<i>Code of Federal Regulations</i>
COC	contaminant of concern
CPD	Clean Parcel Determination
CROET	Community Reuse Organization of East Tennessee
D&D	decontamination and decommissioning
DCE	dichloroethene
DOE	U.S. Department of Energy
DQO	Data Quality Objective
DVS	Dynamic Verification Strategy
EA	Environmental Assessment
EBS	Environmental Baseline Survey
ELCR	excess lifetime cancer risk
EM	Environmental Management
EPA	U.S. Environmental Protection Agency
ETTP	East Tennessee Technology Park
EU	exposure unit
FFA	Federal Facilities Agreement
FY	fiscal year
HI	hazard index
MCL	maximum contaminant level
NCP	National Contingency Plan
NEPA	National Environmental Policy Act of 1969
NFA	No Further Action
NFI	no further investigation
NPL	National Priorities List
OREM	Oak Ridge Office of Environmental Management
ORGDP	Oak Ridge Gaseous Diffusion Plant
ORO	Oak Ridge Office
ORPMP	Oak Ridge Performance Management Plan
ORR	Oak Ridge Reservation
PCCR	Phased Construction Completion Report
RAO	remedial action objective
RI	Remedial Investigation
RL	remediation level
ROD	Record of Decision
T.C.A.	Tennessee Code Annotated
TCE	trichloroethene
TDEC	Tennessee Department of Environment and Conservation
U.S.C.	United States Code
UST	underground storage tank
VC	vinyl chloride
VOC	volatile organic compound



**Covenant Deferral Request for the Proposed Title  
Transfer of the Former Powerhouse, Duct Island, and K-1007-P1 Pond Area  
at the East Tennessee Technology Park, Oak Ridge, Tennessee**

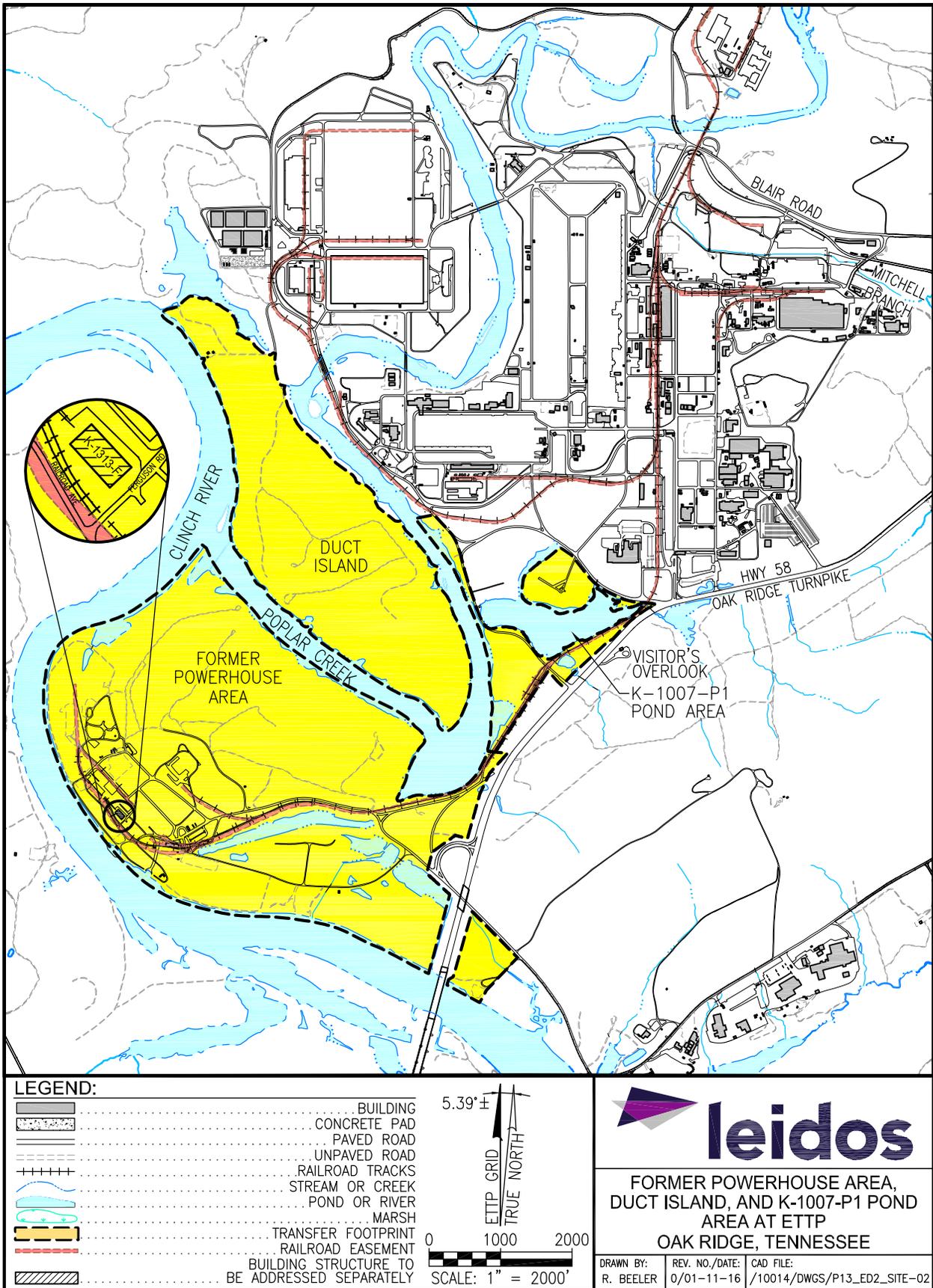
**Introduction**

The U.S. Department of Energy (DOE) is proposing to transfer land designated as the Former Powerhouse, Duct Island, and K-1007-P1 Pond Area, hereafter also referred to as “the Property,” at the East Tennessee Technology Park (ETTP) Heritage Center in Oak Ridge, Tennessee, by deed, and is submitting this Covenant Deferral Request (CDR) pursuant to Section 120(h)(3)(C) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), as amended, and applicable U.S. Environmental Protection Agency (EPA) guidance. The Oak Ridge Reservation (ORR), which includes the ETTP Heritage Center, was placed on the National Priorities List (NPL) in November 1989. Environmental investigation and cleanup activities are continuing at ETTP in accordance with CERCLA, the National Contingency Plan (NCP), and the Federal Facilities Agreement (FFA). The FFA was entered into by the DOE-Oak Ridge Office (ORO), EPA Region 4, and the Tennessee Department of Environment and Conservation (TDEC) in 1991. The FFA establishes the schedule and milestones for environmental remediation of the ORR.

The Zone 1 Interim Record of Decision (ROD) [DOE 2002] identified remedial actions for potentially contaminated soil, buried waste, and subsurface infrastructure necessary to protect human health and to limit further contamination of the groundwater. All work being conducted under the Zone 1 Interim ROD has been completed; however, the ROD goal of unrestricted industrial use was not met in all locations. Therefore, a Zone 1 Final ROD is in preparation that addresses the residual soil contamination remaining after completion of actions conducted under the Zone 1 Interim ROD. Areas of potential future ecological risk will also be addressed by the Zone 1 Final ROD.

The proposed property transfer is a key component of the Oak Ridge Performance Management Plan (ORPMP) for cleanup of the ORR. The Community Reuse Organization of East Tennessee (CROET) is currently leasing approximately 400 acres of the Property and has requested the transfer of portions of the approximately 662 acres included in this CDR. It is anticipated that CROET would be the recipient if the balance of the Property is transferred, but other parties could also request the balance of the Property.

The Property is proposed as the potential site for new facilities to be used for office space, industrial activities, or other commercial uses. The Property consists of two non-contiguous tracts of land, consisting of a total of approximately 662 acres, located in the southwestern portion of the Heritage Center. Figure 1 shows the location of the Former Powerhouse, Duct Island, and K-1007-P1 Pond Area within the Heritage Center. The boundaries of the Property are shown on Figure 2. Only one building is included in the proposed transfer. The K-708-E Scale House, located near the entrance to the Powerhouse Area, is included in the proposed transfer. This building is a small wood-frame structure with corrugated siding and a roof. Inside of K-708-E are the scale and digital readout and printing equipment. Building K-1313-F, located within the



**Figure 1. Location Map of the Former Powerhouse Area, Duct Island, and K-1007-P1 Pond Area Within the ETTP Heritage Center**

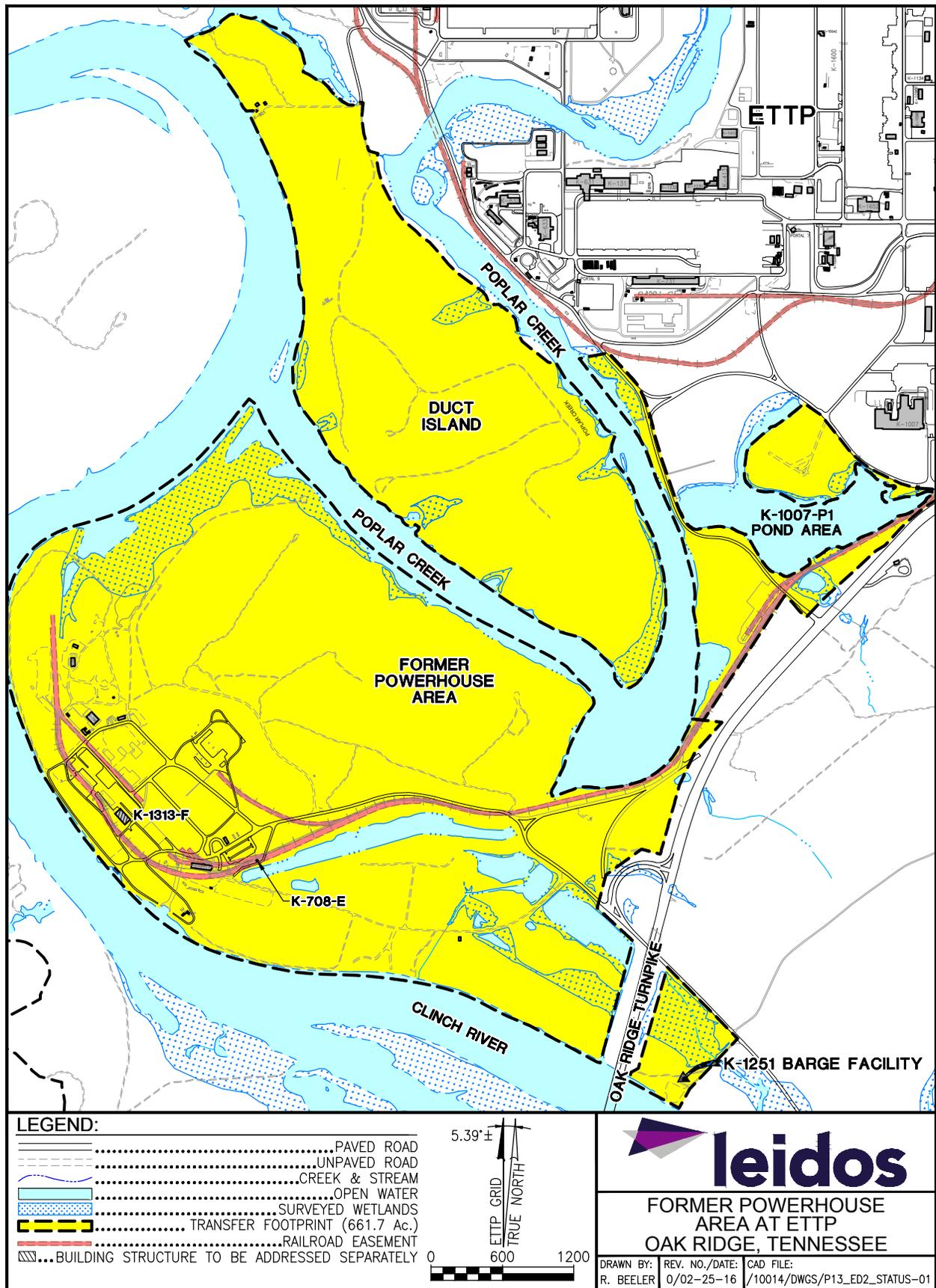


Figure 2. The Former Powerhouse Area, Duct Island, and K-1007-P1 Pond Area Transfer Footprint

transfer footprint (see Figure 2), is currently used for storage of sodium shields and a decision on reuse or demolition of the building will be made once the disposition of the shields has been identified.

The soil and slab underlying Building K-1313-F are part of an exposure unit (EU) [see Section 1.0] with an approved no further action (NFA) determination for soils; hence, the land underlying these structures is included in the transfer footprint of this CDR. The soils beneath K-1313-F were not sampled under the Dynamic Verification Strategy (DVS), but they were included within the scope of the Phased Construction Completion Report (PCCR) that addressed EU Z1-21, which is the EU where Building K-1313-F is located (DOE 2011a). DOE will not transfer the land underlying the building until a disposition determination has been made for the building and confirmatory sampling, and remedial actions, if any, are completed. Confirmatory sampling will be conducted on either the building surfaces, if the building is transferred; the building slab, if the building is demolished and the slab remains; or the underlying soils, if the building slab is removed, or the remaining slab indicates the potential for contamination of the underlying soils. If contamination above ROD RLs is discovered, it will be remediated. If the building is demolished, post-demolition confirmatory sampling of the soil and/or slab (to confirm that the prior NFA determination remains valid) will be documented in a concurrence form and/or a PCCR addendum and transmitted to EPA and TDEC for approval. If the building is determined to be suitable for transfer, the condition of the building will be documented in a concurrence form and/or a PCCR addendum, or other documentation, and submitted to EPA and TDEC for approval.

DOE continues to be responsible for any contamination that is present on the Property at the time of transfer but found after the date of transfer. The deed transferring the Property contains various restrictions and prohibitions on the use of the Property that are subject to enforcement pursuant to State Law Tennessee Code Annotated (T.C.A.) 68-212-225 and real property law. These restrictions and prohibitions are designed to ensure protection of human health and the environment.

CERCLA requires that when the Federal government transfers property where hazardous substances have been stored for one year or more, released, or disposed of, the deed must contain two covenants warranting that 1) all remedial actions necessary to protect human health and the environment from hazardous substances remaining on the property have been taken before the date of the property transfer [CERCLA 120(h)(3)(A)(ii)(I)], and 2) any additional remedial action found to be necessary after the date of the property transfer shall be conducted by the United States [CERCLA 120(h)(3)(A)(ii)(II)]. The deed will contain this last covenant. However, in certain circumstances, EPA, with concurrence of the Governor of the State in which the facility is located, may defer the covenant set forth in CERCLA 120(h)(3)(A)(ii)(I) warranting all remedial actions necessary to protect human health and the environment have been taken, if EPA determines that the property is suitable for transfer based upon the following findings:

1. The property is suitable for transfer for the use intended by the transferee, and such use is consistent with protection of human health and the environment;

2. The deed proposed to govern the transfer between the United States and the GRANTEE of the property contains the Response Action Assurances described in Section 120(h)(3)(C)(ii) of CERCLA with regard to a release, or threatened release, of a hazardous substance for which the Federal agency is potentially responsible, including:
  - a) Provide for any necessary restrictions on the use of the property to ensure the protection of human health and the environment;
  - b) Provide that there will be restrictions on use necessary to ensure that required remedial investigations (RIs), response actions, and oversight activities will not be disrupted;
  - c) Provide that all necessary response actions will be taken, and identify the schedules for investigation and completion of all necessary response actions as approved by the appropriate regulatory agency; and
  - d) Provide that the Federal agency responsible for the property subject to transfer will submit a budget request to the Director of the Office of Management and Budget that adequately addresses schedules for investigation and completion of all necessary response actions, subject to congressional authorizations and appropriations.
3. The Federal agency requesting deferral has provided notice by publication in a newspaper of general circulation in the vicinity of the property, of the proposed transfer and of the opportunity for the public to submit, within a period of not less than 30 days after the date of notice, written comments on the suitability of the property for transfer; and
4. The deferral and the transfer of property will not substantially delay any necessary response action at the property.

These findings are intended to ensure that there is a sound basis for the proposed transfer because the intended reuse of the property does not pose an unacceptable risk to human health or the environment. As stated in CERCLA Section 120(h)(3)(C)(iv), all statutory obligations required of, and rights granted to, a Federal agency remain the same, regardless of whether the property is transferred subject to a covenant deferral.

### **Ecological Impacts**

Potential impacts to ecological receptors can occur from either:

1. impacts that are associated with residual contamination of environmental media that result in risk to ecological receptors; or

2. impacts to ecological receptors from development and/or operational activities occurring after transfer of the property.

Potential impacts to ecological receptors from the first category will be addressed as ecological risk in the Zone 1 Final ROD. There are future potential threats to the ecological terrestrial species at isolated areas that contain soil covers protecting against exposure, should those soil covers erode. The Zone 1 Final ROD will address these areas of potential ecological risk. The final ETTP Sitewide ROD will also evaluate risk from groundwater, sediment, and surface water to human and ecological receptors. DOE will remain responsible, regardless of property ownership, for providing the necessary response actions to address any residual contamination on the property to ensure protection of ecological receptors, and any efforts needed will be coordinated with EPA and TDEC under the FFA.

Potential impacts to ecological receptors from development and/or operational activities resulting from property transfer were addressed in the *Environmental Assessment for Transfer of Land and Facilities within the East Tennessee Technology Park and Surrounding Area, Oak Ridge, Tennessee*, DOE/EA-1640, October 2011 (DOE 2011b), which resulted in a Finding of No Significant Impact. Exhibit B of the Quitclaim Deed, included in Section 6.2 of the CDR, restricts development of the property to the industrial, commercial, and recreational uses evaluated in the environmental assessment. Additionally, following transfer, the new property owner is still subject to regulatory requirements such as storm water management, wetlands protection, and Clean Air Act compliance. Finally, adverse environmental impacts to existing ecological receptors would be limited because construction activities would primarily occur within previously disturbed areas.

DOE hereby requests that EPA Region 4 determine, with the concurrence of the Governor of the State of Tennessee, that the Property is suitable for transfer and that the CERCLA Section 120(h)(3)(A)(ii)(I) covenant may be deferred. The deferral is necessary because an ETTP Sitewide ROD, addressing groundwater, surface water, sediment, and ecological risk, has not been approved. Once the deferral request is granted, DOE will proceed to convey the Property while DOE continues to complete all necessary remediation at the ETTP site in accordance with CERCLA, the NCP, and the FFA. In accordance with CERCLA Section 120(h)(3)(B), this CDR pertains solely to the transfer of this Property, or any portion thereof, to a non-Potentially Responsible Party.

## **1.0 Property Description**

As shown in Figure 1, the Former Powerhouse Area, Duct Island, and K-1007-P1 Pond Area is located in the southwestern portion of the Heritage Center and consists of approximately 662 acres. General descriptions of the Property are contained in the EBS, which is included as Attachment A and summarized below. The Heritage Center, located

in the far western end of the ORR, within the city of Oak Ridge, is the site of the former Oak Ridge Gaseous Diffusion Plant (ORGDP) where uranium enrichment operations occurred from the mid-1940s until the mid-1980s. Prior to construction of the ORGDP, the area was used as farmland. When the ORGDP was active, the Former Powerhouse Area, Duct Island, and K-1007-P1 Pond Area was predominately used for power-generating operations to support the gaseous diffusion process. Portions of the area were also used for equipment maintenance activities, materials storage, and waste disposal. The Heritage Center is now transitioning from DOE to private ownership as cleanup from prior DOE operations progresses. Hence, some of the Heritage Center is owned by DOE, while some has been transferred to the private sector.

As shown in Figure 2, the Former Powerhouse Area, Duct Island, and K-1007-P1 Pond Area consists of two non-contiguous tracts of land (approximately 662 acres) separated by Poplar Creek. The boundaries of the Property along with EU boundaries are shown in Figure 3. The Former Powerhouse Area, Duct Island, and K-1007-P1 Pond Area transfer footprint is bounded by the Clinch River on the western and southwestern boundaries, Poplar Creek and the main plant area of the ETTP on the northeastern boundary, and the Oak Ridge Turnpike, also known as Highway 58, to the southeast (Figure 1). A small portion of the footprint extends south of Highway 58 along the banks of the Clinch River. This portion of the footprint includes the former K-1251 Barge Facility parcel. The transfer footprint includes portions of EUs Z1-01, Z1-02, Z1-05, Z1-06, Z1-07, Z1-08A, Z1-08B, Z1-09, Z1-45, Z1-46, and all of EU Z1-10 through Z1-44, and Z1-47. The 12-acre parcel, located on the south side of Highway 58 (K-1251 Barge Facility), lies outside of Zone 1. [It should be noted that portions of EUs Z1-45 and Z1-46 in the northern end of the property are not included within the study area as they have been identified as part of the Black Oak Ridge Conservation Easement (BORCE)].

The Property consists of ~662 total acres proposed for transfer and includes:

- land that is part of five EUs in the vicinity of the K-1007-P1 Pond where the balance of the EU has already been transferred under a CDR (includes the balance of EUs Z1-01, Z1-05, Z1-06, and Z1-07) [Figure 4];
- land that is part of one EU adjacent to the K-1007-P1 Pond where the balance of the EU has already received EPA concurrence for a Clean Parcel Determination (CPD) [includes the balance of EU Z1-02];
- land that is part of one EU adjacent to the K-1007-P1 Pond and Poplar Creek where the balance of the EU has either already been transferred under a CPD, or has received regulatory approval for no further investigation (NFI) [includes the balance of EU Z1-08A];
- land that is part of one EU in the vicinity of Poplar Creek where the balance of the EU has received regulatory approval for NFI (includes the balance of EU Z1-08B);

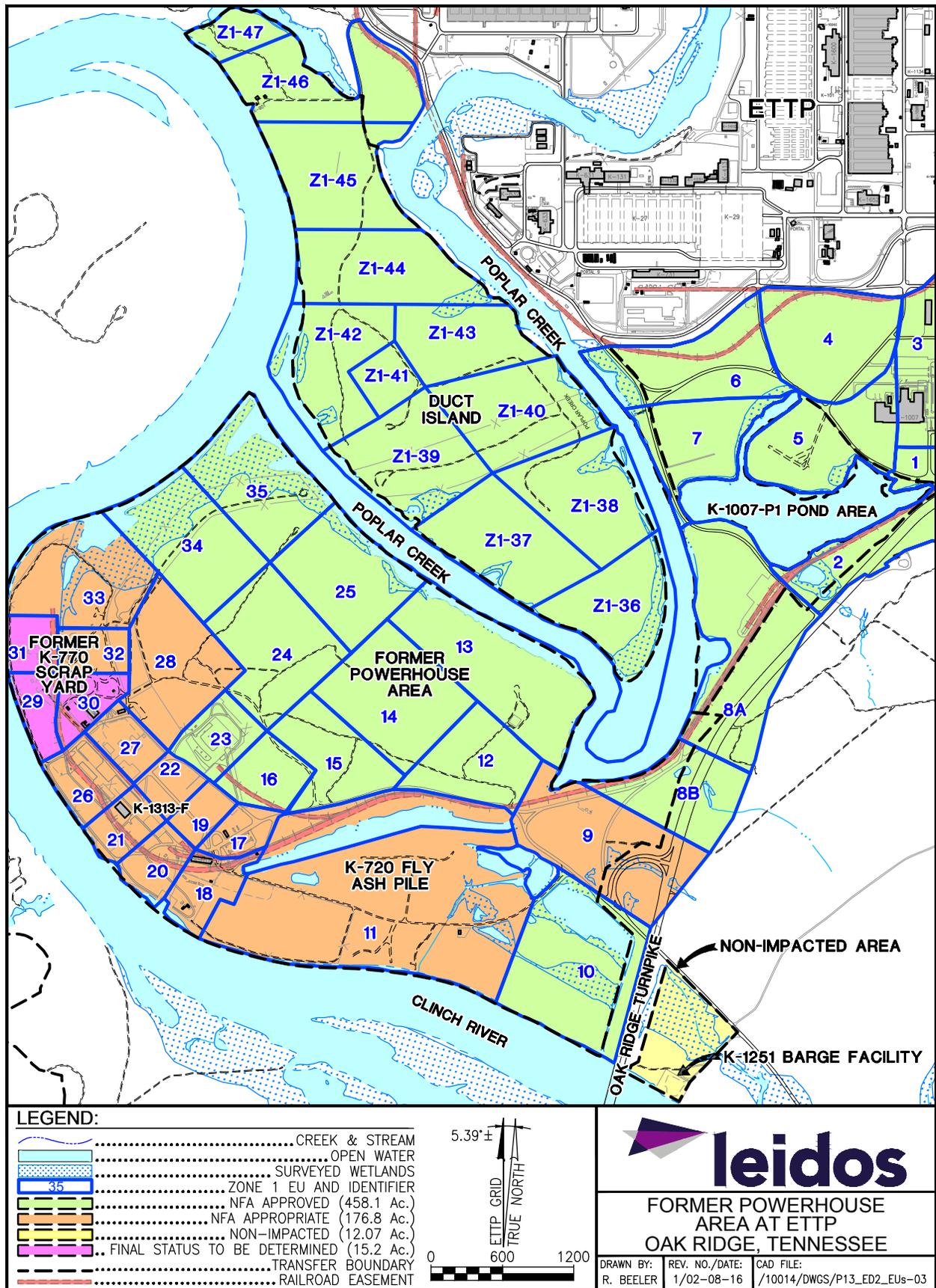


Figure 3. Exposure Units in the Former Powerhouse Area, Duct Island, and K-1007-P1 Pond Area

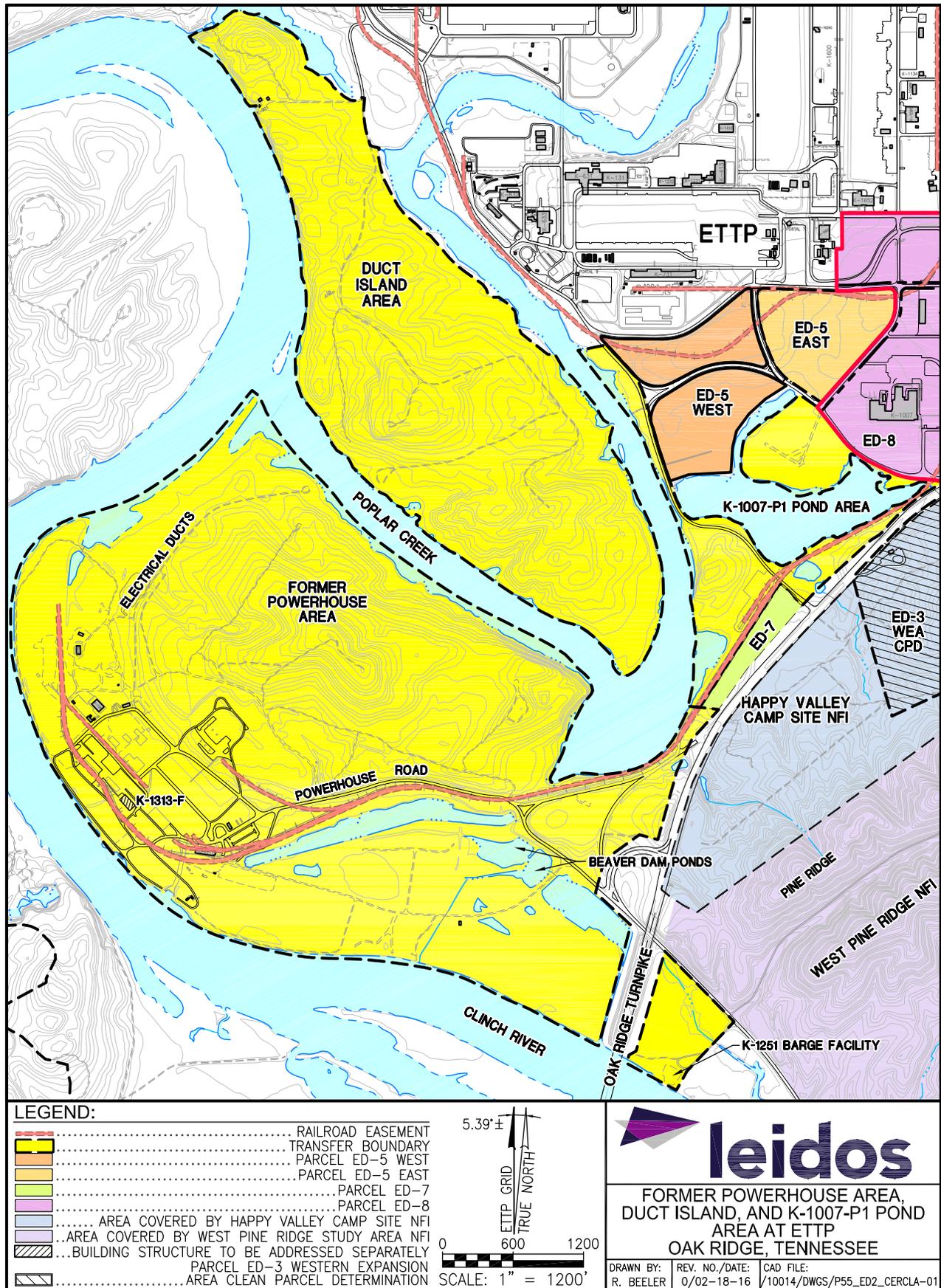


Figure 4. Former Powerhouse Area, Duct Island, and K-1007-P1 Pond Area adjacent property transfers and CERCLA decisions

- land that is part of one EU adjacent to Poplar Creek where the balance of the EU has either received regulatory approval for NFI, or is part of the State Highway 58 right-of-way (EU Z1-09)
- land that is part of two EUs in the vicinity of the K-901-A Pond where the balance of the EU is part of the BORCE (EUs Z1-45 and Z1-46);
- land that includes all of 10 EUs designated as the Duct Island Peninsula (EUs Z1-36 through Z1-44, and Z1-47);
- land that includes all of 26 EUs designated as the Former Powerhouse Area (includes EUs Z1-10 through Z1-35); and
- vacant land adjacent to, and including, the former K-1251 Barge Facility south of Highway 58 that is outside the boundaries of Zone 1 and represents non-impacted property.

The proposed transfer does not include the K-1007-P1 Pond. One building, the K-708-E Scale House, is included in the proposed transfer. Building K-708-E is located near the entrance to the Powerhouse Area (Figure 2), and is a small wood-frame structure with corrugated siding and a roof. Inside the building are the scale and digital readout and printing equipment. Below the building is a concrete pit that extends under the rail line and houses the scale balance mechanism. Building K-1313-F, located in the transfer footprint, currently houses sodium shields and an appropriate disposition pathway has not yet been identified for these shields. Therefore, the building currently cannot be reused or demolished. Once the sodium shields are removed, K-1313-F will be dispositioned for either decontamination and decommissioning (D&D) or beneficial reuse.

Because the soil and slab underlying Building K-1313-F are part of an EU that has met the requirements for a NFA determination for soil, the land underlying these structures is included in the transfer footprint of this CDR. The soils beneath K-1313-F were not sampled under the DVS, but they were included within the scope of the PCCR that addressed EU Z1-21, which is the EU where Building K-1313-F is located (DOE 2011a). DOE will not transfer the land underlying the building until a disposition determination has been made for the building and confirmatory sampling, and remedial actions, if any, are completed. Confirmatory sampling will be conducted on either the building surfaces, if the building is transferred; the building slab, if the building is demolished and the slab remains; or the underlying soils, if the building slab is removed, or the remaining slab indicates the potential for contamination of the underlying soils. If contamination above ROD RLs is discovered, it will be remediated. If the building is demolished, post-demolition confirmatory sampling of the soil and/or slab (to confirm that the prior NFA determination remains valid) will be documented in a concurrence form and/or a PCCR addendum and transmitted to EPA and TDEC for approval. If the building is determined to be suitable for transfer, the condition of the building will be documented in a concurrence form and/or a PCCR addendum, or other documentation, and submitted to EPA and TDEC for approval.

Remedial actions performed within the Former Powerhouse Area, Duct Island, and K-1007-P1 Pond Area have included demolition of the equipment and debris removals, soil removal at the K-1085 Old Firehouse Burn Area, closure in place of three underground storage tanks (USTs) in accordance with TDEC UST rules, removal of soils at four small areas (< 100 square feet) based on walkover radiation survey results, excavation of soil hot spots associated with the underground electrical duct banks, grouting of the duct bank vaults, and removal of 66,800 cubic yards of soil from the K-770 Scrap Yard (Figure 5).

Four remedial actions were conducted during the summer of 2009 in EU Z1-26 in response to DVS observations of RL exceedances at six sample locations. The remedial actions addressed risk to the industrial worker by removing small surface soil areas contaminated with uranium isotopes and <sup>137</sup>Cs. Total soil volume of 3 cubic yards was excavated for disposal. Both confirmation sampling and radiation walkover surveys were conducted to verify that the contamination had been removed. A post-remedial action risk screen of EU Z1-26 conducted in 2010 showed that the EU did not pose a risk to the industrial worker.

A total of four actions were conducted in the K-770 Scrap Metal Yard, including the following:

- K-770 Scrap Yard Soils Remedial Action – DVS investigations identified 36.5 acres of contaminated soil. Excavation was conducted to a depth of up to 2 feet and approximately 66,800 cubic yards of contaminated soil were excavated and removed from the site for disposition. During this remedial action, asbestos-containing materials (ACMs) were discovered. The ACMs in two locations were removed and are included in the total volume of contaminated soil that was excavated, but additional asbestos was left behind pending a decision on the appropriate actions to address these soils.
- K-725 Beryllium Building Slab Remedial Action – The K-725 Beryllium Building Slab was identified for remedial action in the Zone 1 Interim ROD. The slab and a portion of the underlying gravel were removed for disposal.
- F-29 UST Remedial Action – The F-29 UST, which was thought to have contained gasoline, and possibly diesel fuel, was drained of liquids that were removed for off-site disposition and the tank was closed in place by filling with flowable fill in accordance with TDEC regulations.
- K-1093 Debris Remedial Action – The K-1093 Debris Pile was removed for disposal.

The K-770 Scrap Metal Yard remedial actions were followed by confirmation sampling and radiation walkover surveys, which demonstrated that, with the exception of the area containing asbestos in the subsurface, the area was suitable for industrial use.

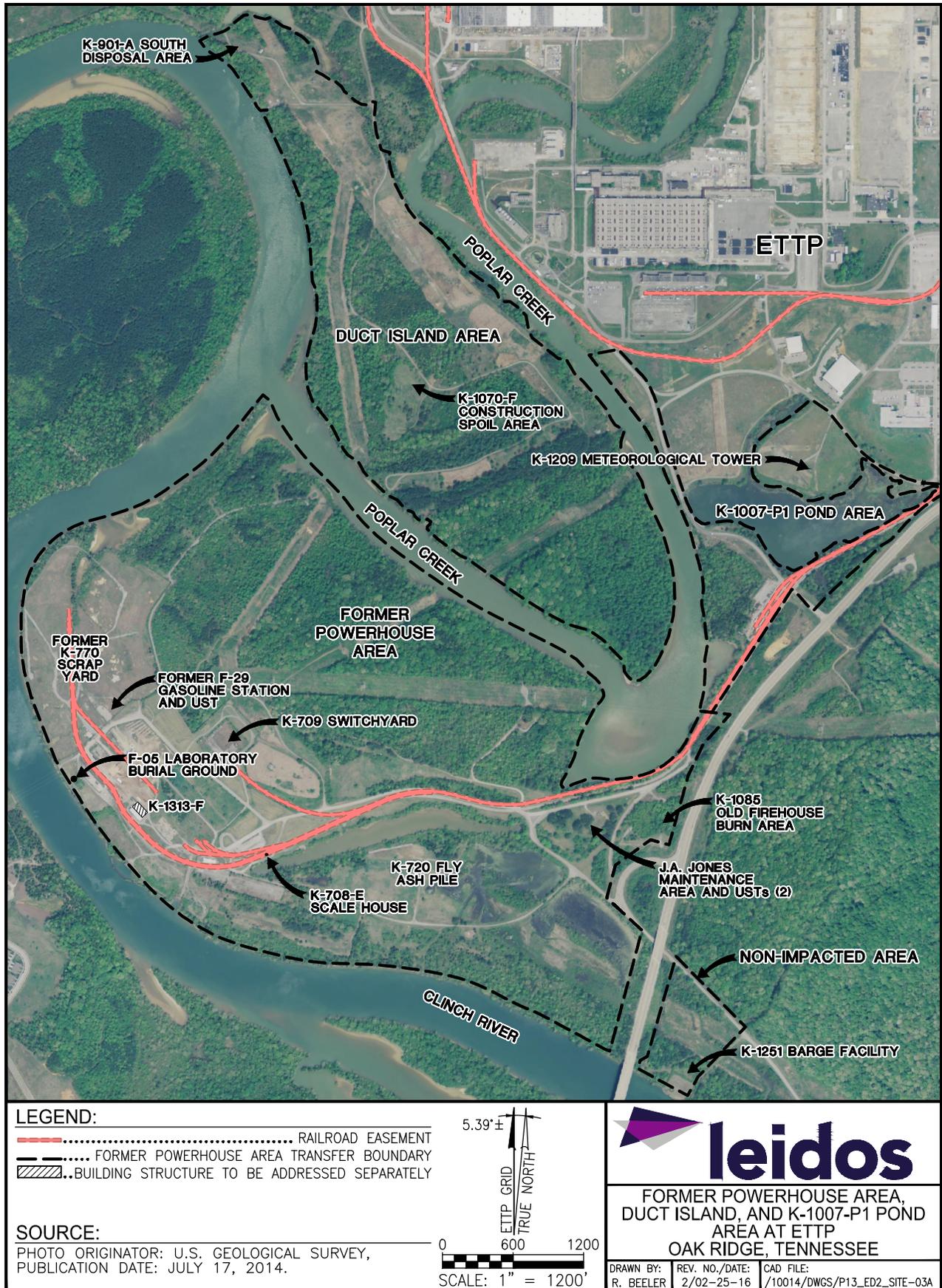


Figure 5. Aerial photograph of the Former Powerhouse Area, Duct Island, and K-1007-P1 Pond Area, circa 2010

## **2.0 Nature/Extent of Contamination**

In accordance with CERCLA Section 120(h), reviews of government records, title documents, and aerial photographs; visual and physical inspections of the Property and adjacent properties; and interviews with current and former employees were conducted to identify any areas on the Property where hazardous substances and petroleum products or their derivatives were stored for one year or more, known to have been released, or disposed of. Additionally, radiological survey and environmental sampling were conducted under the DVS process to assess the condition of the Property. The summary details of these evaluations, including discussions of the nature and extent of contamination, are presented in Section 6.0 of the EBS Report (Attachment A). The findings of the evaluations are summarized in subsections 2.1 through 2.2 below.

EPA guidance allows for the transferring Federal agency to demonstrate why a completed RI or Risk Assessment is not necessary before the land is transferred. Risk evaluations using the regulator-approved DVS process were prepared by the Environmental Management (EM) Program for soils in all of the EUs in which the Former Powerhouse Area, Duct Island, and K-1007-P1 Pond Area is located. The results of these risk evaluations for soils indicate that all risks, doses, and hazards are within acceptable levels of EPA's target risk range for an industrial worker; hence, neither an RI nor a Risk Assessment was necessary. The evaluations are summarized in Section 4.0.

The EM Program has divided approximately 1,400 acres at ETTP into 80 EUs under the Zone 1 ROD for the purposes of evaluating risk and making remedial decisions to protect future users of the site and to protect underlying groundwater. The objective of the Zone 1 remediation measures is to protect industrial workers from exposure to hazardous substances in Zone 1. The institutional controls restricting property use to industrial use, and the limited potential for off-site migration of contaminants, limit the potential for exposure to other individuals.

The Former Powerhouse Area, Duct Island, and K-1007-P1 Pond Area is located in 46 Zone 1 EUs (Figure 3). The proposed transfer footprint includes portions of EUs Z1-01, Z1-02, Z1-05, Z1-06, Z1-07, Z1-08A, Z1-08B, Z1-09, Z1-45, Z1-46, and all of EU Z1-10 through Z1-44, and Z1-47. The 12-acre tract located on the south side of Highway 58 (former K-1251 Barge Facility) lies outside of Zone 1. (It should be noted that portions of EUs Z1-45 and Z1-46 on Duct Island are not included within the study area as they have been identified as part of the BORCE).

The Former Powerhouse Area, Duct Island, and K-1007-P1 Pond Area EBS report (Attachment A) relies upon regulator-approved and completed documentation in the PCCRs (listed below) for the foundational information about the potential for surface and subsurface soil and subsurface structure contamination:

- *Phased Construction Completion Report for the K-1007 Ponds Area and Powerhouse Area in Zone 1 at East Tennessee Technology Park, Oak Ridge, Tennessee,*

(DOE/OR/01-2294&D2), August 2006 (approved) [DOE 2006a] (addresses EUs Z1-01 through Z1-10, Z1-12 through Z1-16, Z1-23 through Z1-25, Z1-34 and Z1-35);

- *Phased Construction Completion Report for the Duct Island Area and K-901 Area in Zone 1, East Tennessee Technology Park, Oak Ridge, Tennessee* (DOE/OR/01-2261&D2), February 2006, (approved) [DOE 2006b] (addresses EUs Z1-36 through Z1-47);
- *Fiscal Year 2008 Phased Construction Completion Report for Exposure Units Z1-01, Z1-03, Z1-38, and Z1-49 in Zone 1 at the East Tennessee Technology Park, Oak Ridge, Tennessee* (DOE/OR/01-2367&D2), March 2008 (approved) [DOE 2008];
- *Addendum to the Phased Construction Completion Report for the K-1007 Ponds Area and Powerhouse North Area in Zone 1, East Tennessee Technology Park, Oak Ridge, Tennessee* (DOE/OR/01-2294&D2/A1/R1), October 2011 (approved) [DOE 2011a] (addresses EUs Z1-09, Z1-11, Z1-17, Z1-18 through -22, and Z1-26); and
- *Addendum II to the Phased Construction Completion Report for the K-1007 Ponds Area and Powerhouse North Area in Zone 1, East Tennessee Technology Park, Oak Ridge, Tennessee* (DOE/OR/01-2294&D2/A2), June 2011 [DOE 2011c] (addresses EUs Z1-27 through Z1-33).

The PCCRs were prepared as part of the EM DVS, a decision document supporting NFA under an industrial land use risk scenario in the EUs that include the Former Powerhouse Area, Duct Island, and K-1007-P1 Pond Area. This process is in use for remedial action decision-making across the ETTP Heritage Center. EPA approval was received on March 13, 2006; October 2, 2006; and April 4, 2008, respectively, for the three PCCRs addressing approximately 458 acres (DOE 2006a; DOE 2006b; DOE 2008) of the K-1007 Ponds Area and Powerhouse Area and the Duct Island Area and K-901 Area. TDEC approval of these three PCCRs was received on March 29, 2006; September 28, 2006; and April 23, 2008, respectively. Based on the results of DVS process, the EUs addressed in the addendums to the K-1007 Ponds Area and Powerhouse North Area meet the requirements for NFA.

A groundwater plume has been identified in the subsurface of the Former Powerhouse Area, Duct Island, and K-1007-P1 Pond Area, in the K-1085 Old Firehouse Burn Area, and north of the K-1007-P1 Pond (Figure 6). These plumes contain volatile organic compounds (VOCs) exceeding drinking water standards. In addition, elevated concentrations of some metals and radioactivity have also been sporadically detected in some of the wells on the Property. Additional discussion of groundwater contamination within the Property is presented in Section 2.2. Currently, groundwater contamination present in Zone 1 will be addressed in the ETTP Sitewide ROD. The EUs included in the Property have been determined to meet the requirements for NFA for soils and NFA for soils as a source to groundwater (DOE 2006a, 2011a, and 2011b).

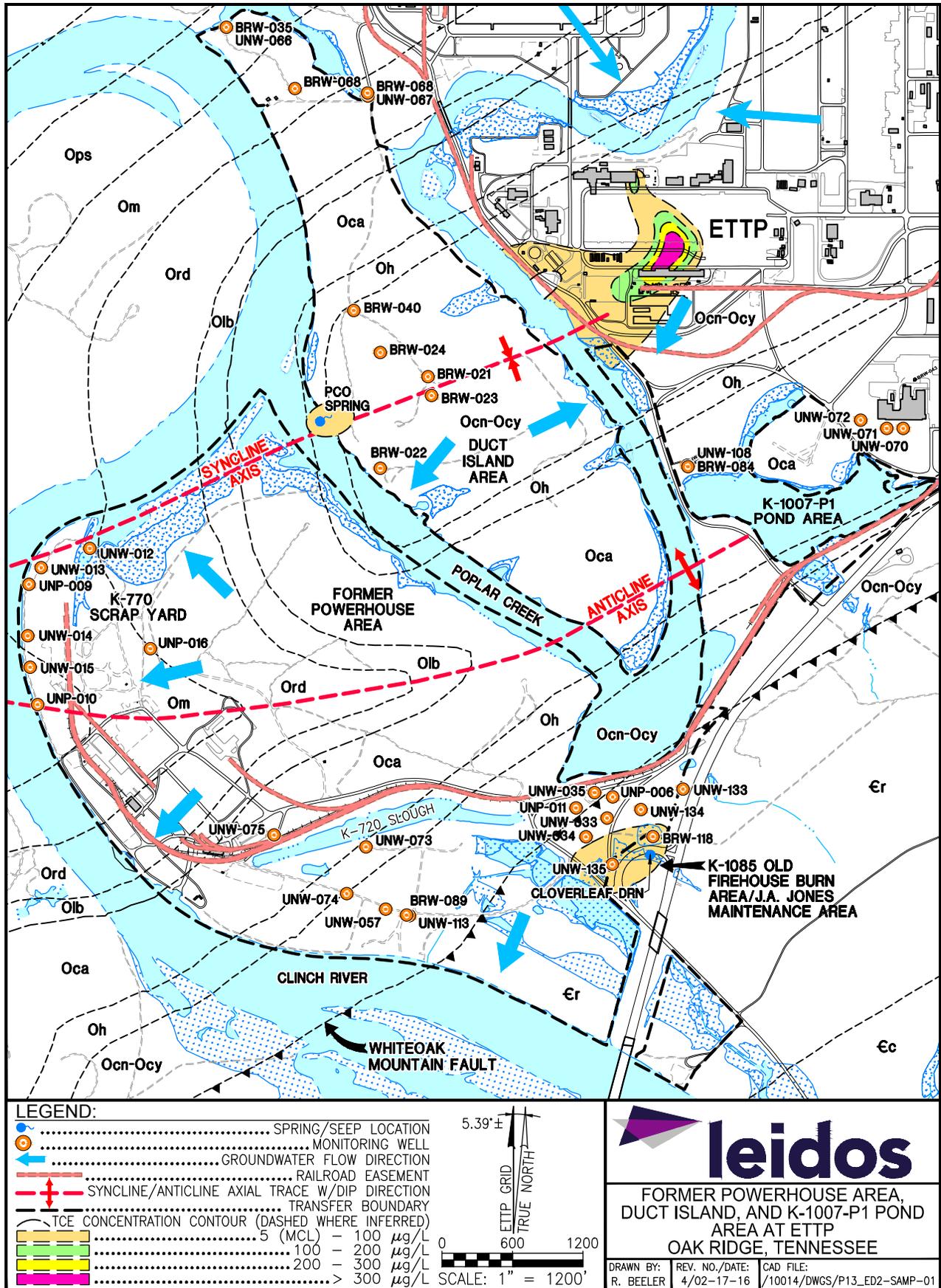


Figure 6. Former Powerhouse Area, Duct Island, and K-1007-P1 Pond Area Monitoring Well Locations

## **2.1 Evaluation of Potential Contamination in the Former Powerhouse Area, Duct Island, and K-1007-P1 Pond Area**

The results of the evaluation are as follows:

- The EUs in which the Former Powerhouse Area, Duct Island, and K-1007-P1 Pond Area are located were assessed under a Work Plan (2007) prepared and approved according to the DVS protocol. The Work Plan was approved by EPA and TDEC on December 7 and 13, 2007, respectively. All verified and validated data used to make regulatory decisions have been placed in the Oak Ridge Environmental Information System database and are available for review. These data were deemed sufficient to reach NFA decisions for soils under an industrial land use scenario for all of the EUs (Z1-01, Z1-02, and Z1-05 through Z1-47) included in the Former Powerhouse Area, Duct Island, and K-1007-P1 Pond Area transfer footprint.
- An evaluation was conducted of the potential impact on the DVS decisions due to the difference in transfer footprint and EU boundaries for EUs Z1-01, Z1-02, Z1-05, Z1-06, Z1-07, Z1-08A, Z1-08B, Z1-09, Z1-45, and Z1-46. This evaluation indicated that for four of the EUs (Z1-01, -05, -06, and -07) partially included in the transfer footprint, the balance of EUs has already been transferred; for two of the EUs (Z1-02 and -08A), the balance of the EUs has received concurrence for CPD; for two of the EUs (Z1-08B and -09), the balance has received regulatory concurrence for NFI; and for two EUs (Z1-45 and -46) where the balance of the EU has been designated as the BORCE; the NFA decisions are appropriate for these partial EUs.
- Building K-1313-F, which is included in the transfer footprint, will either be demolished or be transferred later after confirmatory sampling of the facility has been completed and the building is found to meet the requirements of the Zone 1 ROD. The K-1313-F building is currently used for storage of sodium shields and a decision on reuse or demolition of the building will be made once the disposition of the shields has been identified. Because the soil and slab underlying Building K-1313-F are part of an EU that has met the requirements for an NFA determination, the land underlying these structures is included in the transfer footprint of this CDR. The soils beneath K-1313-F were not sampled under the DVS, but they were included within the scope of the PCCR that addressed EU Z1-21, which is the EU where Building K-1313-F is located (DOE 2011a). DOE will not transfer the land underlying the building until a disposition determination has been made for the building and confirmatory sampling, and remedial actions, if any, are completed. Confirmatory sampling will be conducted on either the building surfaces, if the building is transferred; the building slab, if the building is demolished and the slab remains; or the underlying soils, if the building slab is removed, or the remaining slab indicates the potential for contamination of the underlying soils. If contamination above ROD RLs is discovered, it will be remediated. If the building is demolished, post-demolition confirmatory sampling of the soil and/or slab (to confirm that the prior NFA determination remains valid) will be documented in a concurrence form and/or a PCCR addendum and transmitted to EPA and TDEC for approval. If the

building is determined to be suitable for transfer, the condition of the building will be documented in a concurrence form and/or a PCCR addendum, or other documentation, and submitted to EPA and TDEC for approval.

- The presence of VOCs, metals, and radioactivity in groundwater beneath the Former Powerhouse Area, Duct Island, and K-1007-P1 Pond Area footprint is considered to represent a release of hazardous substances to the proposed transfer footprint (Figure 6). Groundwater data indicate that the VOCs trichloroethene (TCE), 1,2-dichloroethene (DCE), and vinyl chloride (VC); the metals antimony, arsenic, cadmium, chromium, lead, selenium, and thallium; and gross alpha radioactivity have been observed historically to exceed their respective maximum contaminant levels (MCLs). A decision on groundwater remediation will be made in the ETTP Final Sitewide ROD.

## **2.2 ETTP Soil and Groundwater Contamination**

Currently, of the approximately 2,200 acres within Zones 1 and 2 at the Heritage Center, about 1,970 acres had been characterized for soil media (surface and subsurface). To support characterization activities, over 2,100 samples have been collected and evaluated by EM. These activities have resulted in NFA determinations under an industrial land use risk scenario for approximately 1,680 of the 2,200 acres within the two zones.

The Heritage Center has known contaminated groundwater plumes (consisting mainly of VOCs with concentrations ranging from a high of approximately 15 parts per million in the far northeast portion of the site to non-detectable concentrations that resulted from past operations). A contaminated groundwater plume has been identified beneath a portion of the Former Powerhouse Area, Duct Island, and K-1007-P1 Pond Area. A groundwater plume has been identified beneath a portion of EUs Z1-06 in the northeastern portion of the property and Z1-09 in the southeastern portion of the property (Figure 6). Additional groundwater contamination has been identified beneath the Former Powerhouse and Duct Island Areas, but no obvious groundwater plume has been defined in these areas. Although available potentiometric maps indicate that the identified plumes are only flowing beneath a small portion of the property and likely discharge to adjacent surface water bodies, there is uncertainty concerning groundwater flow paths due to the karst conditions in the bedrock underlying most of the Heritage Center.

### **2.2.1 Vapor Intrusion Sampling**

Because of the occurrence of VOCs in known contaminated groundwater plumes at the Heritage Center, EPA Region 4 recommended investigation of the potential vapor intrusion pathway for site facilities that are targeted for transfer under a CERCLA Section 120(h) CDR. In accordance with EPA's *OSWER Technical Guide for Assessing and Mitigating the Vapor Intrusion Pathway from Subsurface Vapor Sources to Indoor Air*, Office of Solid Waste and Emergency Response (OSWER) Publication 9200.2-

154(EPA 2015), and through consultation with representatives from EPA Region 4, DOE-ORO developed a process to evaluate the potential for vapor intrusion at ETPP Heritage Center properties to be transferred to the private sector. This process calls for development of vapor intrusion investigation and control requirements on a case-by-case basis, dependent upon conditions present at properties being transferred. Based on the EPA Memorandum “Final Vapor Intrusion Technical Guides” (Stanislaus, June 11, 2015), the *OSWER Technical Guide for Assessing and Mitigating the Vapor Intrusion Pathway from Subsurface Vapor Sources to Indoor Air* (OSWER 9200.2-154, June 2015) has replaced the 2002 draft guidance. However, the 2015 guidance appears to be consistent in the approach of providing flexibility to accommodate a range of site-specific and building-specific considerations.

The Quitclaim Deed condition addressing vapor intrusion for the former Powerhouse Area, Duct Island, and K-1007-P1 Pond Area is found in Section 6.2, Condition (11). The Oak Ridge Office of Environmental Management (OREM), EPA Region 4, and TDEC have agreed that vapor intrusion will be addressed in the ETPP final Sitewide ROD.

### 2.3 ETPP Building Demolition Activities

As part of the cleanup of the Heritage Center, numerous facilities are being demolished. Key facilities that formerly occupied portions of the Former Powerhouse Area, Duct Island, and K-1007-P1 Pond Area, but have been demolished, include the following:

F-01 Process Bldg.	F-05 Laboratory
F-08 Laboratory	F-07 Materials Warehouse
F-29 Gasoline Station	K-701 Boiler House
K-702 Turbine Room	K-703 Fabrication Shop
K-704 Main Switch House	K-705-B Crib House
K-706 Pump House	K-707 Auxiliary Switch House
K-705-C Breaker House (for breaking coal)	K-710 Sludge Beds
K-712 Fairchild Substation	K-715 Water Valve House
K-724 Storage Warehouse	K-725 Beryllium Bldg.
K-726 Boiler House	K-734 Storage Warehouse
K-735 Storage Warehouse	K-736 Storage Bldg.
K-738 Chlorinator House and Chlorine Cylinder Storage	K-739 Storage Shed
K-740 Paint House	

Demolition planning and execution for other Heritage Center facilities, such as Building K-1313-F, if conducted, will include appropriate work controls that will be

utilized to minimize and control the release of hazardous substances during demolition activities, such that surrounding properties and persons are protected.

### **3.0 Analysis of Intended Land Use During the Deferral Period**

The Property proposed for transfer is situated within an industrial site (Heritage Center) that is being transitioned from the federal ownership to private ownership. As stated previously, the Heritage Center is being remediated to allow for its conversion to a brownfield mixed-use commercial and industrial park. During the deferral period, the Property may be left as it is, or facilities may be constructed on it as allowed by the deed. Risk evaluations were performed to determine whether the Property is acceptable for industrial uses by the private sector. The results of the risk evaluations are presented in Section 4.0 below.

### **4.0 Risk Evaluation Results**

Zone 1 remedial action objectives (RAOs) were developed by the DVS to support the future industrial use of the Heritage Center. Therefore, remediation criteria were designed for the protection of the future industrial worker. The decision rules established in the DVS were based on one or more of the following criteria:

- exceedance of a maximum RL at any location,
- exceedance of an average RL across the EU,
- unacceptable future threat to groundwater, or
- unacceptable cumulative excess lifetime cancer risk (ELCR) of  $> 1 \times 10^{-4}$  and hazard index (HI)  $> 1$  across the EU.

The NCP preamble (55 *Federal Register* 8716, March 8, 1990) describes the process used to establish the remediation goal for environmental media as consisting of a two-step approach. First, an individual lifetime excess cancer risk of  $10^{-6}$  is used as a starting point for establishing remediation goals for the risks from contaminants at specific sites. The second step involves consideration of a variety of site-specific or remedy-specific factors, which enter into the determination of where, within the risk range, the cleanup standard for a given contaminant will be established. The factors considered in the development of the Zone 1 ROD and subsequent steps in the implementation of the ROD, such as the DVS, included an acceptable *cumulative* risk level of  $10^{-4}$ , which is the upper bound of the EPA-acceptable risk range. From the Zone 1 ROD (Section 1.4): “The remedial action objective (RAO) for Zone 1 includes the following: ‘*Protect human health under an industrial land use to an excess cancer risk at or below  $1 \times 10^{-4}$ .*’” Zone 1 RAOs were developed by the DVS to support the future use of  $10^{-4}$  cumulative ELCR across the EU as one of the decision criteria. To achieve the RAO, constituent-specific cleanup goals were developed. Per the NCP preamble, these cleanup goals are to be based on a risk level of  $10^{-6}$  for

individual constituents unless site-specific or remedy-specific factors exist to suggest modifications are appropriate. For the Zone 1 Interim ROD, these factors include the following:

- Site-Specific Exposure Factors
  - exposure of the industrial worker is limited to soil-related pathways only (multiple media exposures are not applicable to this scenario), and
  - the limited contaminant of concern (COC) list indicates that the potential for a large number of remedial goal exceedances was considered unlikely in the ROD, allowing for a higher risk level for each COC considered, while still achieving a cumulative risk  $<10^{-4}$ . However, the ROD indicates that additional COCs were identified within Zone 1, and additional COCs may be identified from the characterization sampling to be conducted covering a wide range of potential contaminants.
- Remedy-Specific Technical Factors
  - remedial goals for particular COCs were generated at a risk level  $>10^{-5}$  due to cost prohibitiveness and impracticality of remediation to a lower concentration, and
  - remedial goals for particular COCs were revised to reflect consideration of elevated background levels.<sup>1</sup>
  - control leaching and migration from contaminated soil to help minimize further impacts to groundwater.

Incorporation of the factors above provided RLs that reflect the RAO of achieving a cumulative human health risk that will not exceed  $10^{-4}$  for a given EU or FFA site.

Table 4.1 summarizes the decisions and final status summary under an industrial land use risk scenario for the EUs in which the Former Powerhouse Area, Duct Island, and K-1007-P1 Pond Area is located. As noted in the table, the decision on potential groundwater remedial actions will be made in the ETTP Sitewide ROD. A decision on the K-720 Fly Ash Pile and its potential impact on groundwater will also be deferred to the ETTP Final Sitewide ROD. The need for additional remediation of soils at the K-1085 Burn Area Burial Site is deferred to the Zone 1 Final ROD. Soil removal for the protection of ecological resources in EU Z1-38 will be conducted under the Zone 1 Final ROD, as well as placement of a soil cover over the potential subsurface asbestos in EUs Z1-29, Z1-30, Z1-31, and Z1-33.

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<sup>1</sup> “Elevated background levels” refer to certain radionuclides, such as <sup>226</sup>Ra and <sup>232</sup>Th whose natural background levels exceed the established Zone 1 risk goal, and an alternative remediation level has been established in the Zone 1 Interim ROD.

**Table 4.1. Former Powerhouse Area, Duct Island, and K-1007-P1 Pond Area Risk Evaluation Results**

EU	Associated FFA sites	Decision rule evaluation				Risk evaluation	Final status decision
		Max RL	Avg RL	Risk	GW		
Z1-01 <sup>a</sup>	S-21 Happy Valley Service Station	NFA	NFA	NFA	NFA	Passes	NFA for soils
Z1-02 <sup>b</sup>	No FFA site associated with EU	NFA	NFA	NFA	NFA	Passes	NFA for soils
Z1-05 <sup>b</sup>	K-1007 Gas Tank (Residual Contamination)	NFA	NFA	NFA	NFA	Passes	NFA for soils
	K-1048 Tire and Battery Shop	NFA	NFA	NFA	NFA	Passes	NFA for soils
	K-1050 Wash, Paint, and Grease Shop	NFA	NFA	NFA	NFA	Passes	NFA for soils
Z1-06 <sup>b</sup>	695/687 Oil Storage Operations	NFA	NFA	NFA	NFA	Passes	NFA for soils
Z1-07 <sup>b</sup>	J. A. Jones Disposal Area	NFA	NFA	NFA	NFA	Passes	NFA for soils
	Contractor's Road Study Area (#21c)	NFA	NFA	NFA	NFA	Passes	NFA for soils
	695/687 Oil Storage Operations	NFA	NFA	NFA	NFA	Passes	NFA for soils
Z1-08A <sup>b</sup>	Roundhouse Road	NFA	NFA	NFA	NFA	Passes	NFA for soils
Z1-08B <sup>b</sup>	Demolition Materials Placement Area	NFA	NFA	NFA	NFA	Passes	NFA for soils
Z1-09 <sup>c</sup>	K-1085 Old Firehouse Burn Area	NFA	NFA	NFA	NFA	Passes	NFA for soils
	K-1085 Old Firehouse Burn Area Burial Site	NFA*	NFA*	NFA*	NFA*	Passes*	NFA for soils*
	J.A. Jones Maintenance Complex	NFA	NFA	NFA	NFA	Passes	NFA for soils
Z1-10 <sup>b</sup>	No FFA site associated with EU	NFA	NFA	NFA	NFA	Passes	NFA for soils
Z1-11 <sup>c</sup>	K-720 Fly Ash Pile	NFA	NFA	NFA	TBD*	Passes	NFA for soils
Z1-12 <sup>b</sup>	No FFA site associated with EU	NFA	NFA	NFA	NFA	Passes	NFA for soils
Z1-13 <sup>b</sup>	No FFA site associated with EU	NFA	NFA	NFA	NFA	Passes	NFA for soils
Z1-14 <sup>b</sup>	No FFA site associated with EU	NFA	NFA	NFA	NFA	Passes	NFA for soils
Z1-15 <sup>b</sup>	No FFA site associated with EU	NFA	NFA	NFA	NFA	Passes	NFA for soils
Z1-16 <sup>b</sup>	518 Main Substation	NFA	NFA	NFA	NFA	Passes	NFA for soils
Z1-17 <sup>c</sup>	722 Area Roads	NFA	NFA	NFA	NFA	Passes	NFA for soils
Z1-18 <sup>c</sup>	K-710 Sludge Beds and Imhoff Tanks	NFA	NFA	NFA	NFA	Passes	NFA for soils
	722 Area Roads	NFA	NFA	NFA	NFA	Passes	NFA for soils
Z1-19 <sup>c</sup>	722 Area Roads	NFA	NFA	NFA	NFA	Passes	NFA for soils
Z1-20 <sup>c</sup>	722 Area Roads	NFA	NFA	NFA	NFA	Passes	NFA for soils
Z1-21 <sup>c</sup>	722 Area Roads	NFA	NFA	NFA	NFA	Passes	NFA for soils
Z1-22 <sup>c</sup>	722 Area Roads	NFA	NFA	NFA	NFA	Passes	NFA for soils

**Table 4.1. Former Powerhouse Area, Duct Island, and K-1007-P1 Pond Area Risk Evaluation Results (cont.)**

EU	Associated FFA sites	Decision rule evaluation				Risk evaluation	Final status decision
		Max RL	Avg RL	Risk	GW		
Z1-23 <sup>b</sup>	Building 523 Grease Burial Site	NFA	NFA	NFA	NFA	Passes	NFA for soils
	Building 526 Heavy Equipment Shop	NFA	NFA	NFA	NFA	Passes	NFA for soils
	K-709 Storage Yard	NFA	NFA	NFA	NFA	Passes	NFA for soils
	709 Switchyard Soils	NFA	NFA	NFA	NFA	Passes	NFA for soils
Z1-24 <sup>b</sup>	No FFA site associated with EU	NFA	NFA	NFA	NFA	Passes	NFA for soils
Z1-25 <sup>b</sup>	No FFA site associated with EU	NFA	NFA	NFA	NFA	Passes	NFA for soils
Z1-26 <sup>c</sup>	F-05 Laboratory Burial Ground	NFA	NFA	NFA	NFA	Passes	NFA for soils
	F-07 Material Warehouse	NFA	NFA	NFA	NFA	Passes	NFA for soils
	F-08 Laboratory	NFA	NFA	NFA	NFA	Passes	NFA for soils
	722 Area Roads	NFA	NFA	NFA	NFA	Passes	NFA for soils
Z1-27 <sup>d</sup>	No FFA site associated with EU	NFA	NFA	NFA	NFA	Passes	NFA for soils
Z1-28 <sup>d</sup>	No FFA site associated with EU	NFA	NFA	NFA	NFA	Passes	NFA for soils
Z1-29 <sup>d</sup>	No FFA site associated with EU	NFA*	NFA*	NFA*	NFA*	Passes*	NFA for soils*
Z1-30 <sup>d</sup>	Bldg. F-29 Gasoline Station	NFA*	NFA*	NFA*	NFA*	Passes*	NFA for soils*
	K-725 Beryllium Building Soils	NFA*	NFA*	NFA*	NFA*	Passes*	NFA for soils*
Z1-31 <sup>d</sup>	None	NFA*	NFA*	NFA*	NFA*	Passes*	NFA for soils*
Z1-32 <sup>d</sup>	K-770 Scrap Metal Yard	NFA*	NFA*	NFA*	NFA*	Passes*	NFA for soils*
Z1-33 <sup>d</sup>	K-770 Cooling Tower Wood Debris	NFA*	NFA*	NFA*	NFA*	Passes*	NFA for soils*
	K-770 Contaminated Debris	NFA*	NFA*	NFA*	NFA*	Passes*	NFA for soils*
Z1-34 <sup>b</sup>	No FFA site associated with EU	NFA	NFA	NFA	NFA	Passes	NFA for soils
Z1-35 <sup>b</sup>	Powerhouse Knoll Study Area (#21a)	NFA	NFA	NFA	NFA	Passes	NFA for soils
Z1-36 <sup>e</sup>	None	NFA	NFA	NFA	NFA	Passes	NFA for soils
Z1-37 <sup>e</sup>	None	NFA	NFA	NFA	NFA	Passes	NFA for soils
Z1-38 <sup>e,f</sup>	Duct Island Soil Mounds	NFA*	NFA*	NFA*	NFA*	Passes*	NFA for soils*
Z1-39 <sup>e</sup>	K-1070-F Construction Spoil Area Duct Island Road	NFA	NFA	NFA	NFA	Passes Ducts to be addressed through land use controls.	NFA for soils

**Table 4.1. Former Powerhouse Area, Duct Island, and K-1007-P1 Pond Area Risk Evaluation Results (cont.)**

EU	Associated FFA sites	Decision rule evaluation				Risk evaluation	Final status decision
		Max RL	Avg RL	Risk	GW		
Z1-40 <sup>e</sup>	Duct Island Study Area Duct Island Road	NFA	NFA	NFA	NFA	Passes Ducts to be addressed through land use controls.	NFA for soils
Z1-41 <sup>e</sup>	K-1070-F Construction Spoil Area K-900 Bottle Smasher Duct Island Road	NFA	NFA	NFA	NFA	Passes	NFA for soils
Z1-42 <sup>e</sup>	K-1070-F Construction Spoil Area Duct Island Road	NFA	NFA	NFA	NFA	Passes	NFA for soils
Z1-43 <sup>e</sup>	Duct Island Road	NFA	NFA	NFA	NFA	Passes Area Weighted Risk Assessment	NFA for soils
Z1-44 <sup>e</sup>	Duct Island Road	NFA	NFA	NFA	NFA	Passes	NFA for soils
Z1-45 <sup>e</sup>	None	NFA	NFA	NFA	NFA	Passes	NFA for soils
Z1-46 <sup>e</sup>	None	NFA	NFA	NFA	NFA	Passes	NFA for soils
Z1-47 <sup>e</sup>	K-901-A South Disposal Area	NFA	NFA	NFA	NFA	Passes	NFA for soils

<sup>a</sup> Decision rule and risk evaluation information are from DOE/OR/01-2367&D2.

<sup>b</sup> Decision rule and risk evaluation information are from DOE/OR/01-2294&D2.

<sup>c</sup> Decision rule and risk evaluation information are from DOE/OR/01-2294&D2/A1/R1.

<sup>d</sup> Decision rule and risk evaluation information are from DOE/OR/01-2294&D2/A2.

<sup>e</sup> Decision rule and risk evaluation information are from DOE/OR/01-2261&D2.

<sup>f</sup> Decision rule and risk evaluation information are from DOE/OR/01-2367&D2.

\* The decision on groundwater remediation will be made in the East Tennessee Technology Park (ETTP) Sitewide Final Record of Decision (ROD). Since the K-720 Fly Ash Pile is in the groundwater, separating the decisions on source to groundwater and groundwater remediation is not practical. Therefore, a decision on the K-720 Fly Ash Pile and its impact on groundwater will be deferred to the ETTP Final Sitewide ROD. The need for additional remediation of soils at the K-1085 Burn Area Burial Site is deferred to the Zone 1 Final ROD. Soil removal for the protection of ecological resources in exposure unit (EU) Z1-38 will be conducted under the Zone 1 Final ROD. A soil cover will be placed over the potential subsurface asbestos in EUs Z1-29, Z1-30, Z1-31, and Z1-33 under the Zone 1 Final ROD.

FFA = Federal Facilities Agreement.

GW = groundwater.

NFA = no further action.

RL = remediation level.

TBD = to be determined.

**Table 4.2. Land use controls for the Former Powerhouse Area, Duct Island, and K-1007-P1 Pond Area**

Type of control	Purpose of control	Duration	Implementation	Affected area <sup>a</sup>
1. Property Record A. Land Use  B. Groundwater	Restrict uses of certain property by imposing limitations, protect soil covers  Prohibits use of groundwater	Until the concentrations of hazardous substances are at such levels to allow for unrestricted use and exposure; groundwater use prohibitions are in place until the final groundwater decision is made	Drafted and implemented by DOE upon transfer of affected areas; recorded by DOE in accordance with state law at Roane County Register of Deeds office	<ul style="list-style-type: none"> <li>• Use compatible with inspecting and maintaining soil cover at K-720 Fly Ash Pile; no industrial use allowed</li> <li>• Controlled industrial or recreational use at K-770 and Duct Bank corridor (controls needed to excavate beneath 2 ft)</li> <li>• Unrestricted industrial or recreational use in rest of Zone 1 where residual contamination prohibits unrestricted use</li> <li>• Prohibits groundwater use throughout all of Zone 1</li> </ul>
2. Property Record and Other Notices <sup>e</sup>	Provide information to the public about the existence and location of contaminated areas and media and limitations on their use	Until the concentrations of hazardous substances are at such levels to allow for unrestricted use and exposure	Notice of Land Use Restrictions recorded in Roane County Register of Deeds office upon transfer of affected areas	<ul style="list-style-type: none"> <li>• Use compatible with inspecting and maintaining soil cover at K-720</li> <li>• Controlled industrial or recreational use at K-770 and Duct Bank corridor (controls needed to excavate beneath 2 ft)</li> <li>• Unrestricted industrial or recreational use in rest of Zone 1 where residual contamination prohibits unrestricted use</li> </ul>
3. Zoning Notices <sup>d</sup>	Provide notice to city and county about the existence and location of waste disposal and residual contamination areas and limitations on their use for zoning/planning purposes	Until the concentrations of hazardous substances are at such levels to allow for unrestricted use and exposure	Zoning notice and survey plat filed with City and County Planning Commissions upon transfer of affected area	<ul style="list-style-type: none"> <li>• Use compatible with inspecting and maintaining soil cover at K-720</li> <li>• Controlled industrial or recreational use at K-770 and Duct Bank corridor (controls needed to excavate beneath 2 ft)</li> <li>• Unrestricted industrial or recreational use in rest of Zone 1 where residual contamination prohibits unrestricted use</li> </ul>

**Table 4.2. Land use controls for the Former Powerhouse Area, Duct Island, and K-1007-P1 Pond Area (cont.)**

Type of control	Purpose of control	Duration	Implementation	Affected area <sup>a</sup>
4. Excavation/Penetration Permit Program	Provide notice to worker/developer (i.e., permit requestor) on extent of contamination and prohibit or limit excavation/penetration activity	Until the concentrations of hazardous substances are at such levels to allow for unrestricted use and exposure	Implemented by DOE and its contractors; initiated by permit request	<ul style="list-style-type: none"> <li>• K-720, K-770, and Duct Bank (notice of potential contamination below 2 ft)</li> <li>• Excavation/Penetration activities at K-720 Fly Ash Pile prohibited</li> <li>• Elsewhere in Zone 1 where residual contamination remains below 10 ft (notice of potential contamination)</li> </ul>
5. Signs	Provide notice or warning to prevent unauthorized access	As long as waste remains	Signage maintained by DOE	<ul style="list-style-type: none"> <li>• At K-720 Fly Ash Pile where residual waste is covered</li> <li>• At the K-1007-P1 Pond where a restriction on mowing to maintain a buffer is required</li> </ul>

*Note:* Modified from *Proposed Plan for Final ROD for Soils in Zone 1 at East Tennessee Technology Park, Oak Ridge, Tennessee* (DOE/OR/01-2648&D4).

<sup>a</sup> Affected Areas – Specific locations identified as part of a remedial design report/remedial action work plan.

<sup>b</sup> Property Record Restrictions – Includes conditions and/or covenants that restrict or prohibit certain uses of real property and are recorded along with original property acquisition records of DOE and its predecessor agencies.

<sup>c</sup> Property Record Notices – Refers to any non-enforceable, purely informational document recorded along with the original property acquisition records of DOE and its predecessor agencies that alert anyone searching property records to important information about residual contamination/waste disposal areas on the property.

<sup>d</sup> Zoning Notices – Includes information on the location of waste disposal areas and residual contamination depicted on a survey plat, which is provided to a zoning authority (i.e., City Planning Commission) for consideration in appropriate zoning decisions for non-DOE property.

<sup>e</sup> Excavation/Penetration Permit Program – Refers to the internal DOE/DOE contractor administrative program(s) that require the permit requestor to obtain authorization, usually in the form of a permit, before beginning any excavation/penetration activity for the purpose of ensuring that the proposed activity will not affect underground utilities/structures or will not disturb the affected area without the appropriate precautions and safeguard.

DOE = U.S. Department of Energy.

The risk evaluation results (found in Section 7.0 of Attachment A of this CDR) indicate that all risks, doses, and hazards are considered within acceptable levels of EPA's target risk range for an industrial worker.

DOE also considered risks from exposure to the larger Heritage Center site through evaluation of a "roving worker" who may access multiple areas across the site. The roving worker scenario is considered to be applicable to all of the Heritage Center, including transferred areas.

This evaluation was based on certain assumptions, including (1) the worker will not be exposed to areas that are inaccessible due to radiological or other controls, such as fences or other barriers, or postings that prevent casual entry by a worker at a nearby building; and (2) there are no "hotspots" of contamination at the Heritage Center that are accessible to these workers.

The results of the roving worker risk screen, which used all available data, show that risks/hazards are within EPA's acceptable risk range. As a part of the ongoing Heritage Center cleanup, soil data and confirmatory sampling data continue to be collected and have been used to support numerous NFA decisions under an industrial land use risk scenario. Cleanup and confirmatory sampling work are ongoing. The EUs associated with the Former Powerhouse Area, Duct Island, and K-1007-P1 Pond Area have either obtained NFA concurrence from EPA and TDEC, or have met the requirements for NFA. Therefore, the Property is suitable for transfer for the intended industrial use.

#### **4.1 Vapor Intrusion Pathway Evaluation**

VOCs have been detected in groundwater, soil, and soil vapors in the Former Powerhouse Area, Duct Island, and K-1007-P1 Pond Area at low concentrations. The limited data available do not indicate a high likelihood of the presence of subsurface vapor sources (e.g., groundwater volatile organic plume) in the Former Powerhouse Area, Duct Island, and K-1007-P1 Pond Area that pose a significant threat of vapor intrusion.

Groundwater data indicate the presence of VOCs in shallow groundwater beneath the K-1085 Old Firehouse Burn/J.A. Jones Maintenance Areas in the southeastern portion of the Former Powerhouse Area, Duct Island, and K-1007-P1 Pond Area (Figure 6). The groundwater contamination identified beneath the Former Powerhouse Area, Duct Island, and K-1007-P1 Pond Area is primarily found in the unconsolidated zone above bedrock, with significantly lower concentrations of VOCs present in the underlying bedrock. The VOCs that have been detected above the federal and state drinking water MCL in this plume include *cis*-1,2-DCE; TCE; and VC. Groundwater concentrations of TCE detected in 2015 have ranged from 9 to 94 µg/L in the K-1085 Old Firehouse Burn Area. However, concentrations have declined significantly over the past 5 years in this area. VOCs have sporadically been detected in the Duct Island Area and continue to be detected at Spring PC-O located on the bank of Poplar Creek (Figure 6). However, VOCs are generally absent from other areas of the Property.

At other locations across the Heritage Center, soil vapor samples have been taken from approximately 95 sample locations from within 13 buildings and 2 land parcels, with a total of 191 soil vapor samples collected, including buildings over known groundwater plumes. Based on these soil vapor sample results, a complete vapor intrusion pathway does not exist for any of the buildings or vacant properties that have been sampled.

## **5.0 Response/Corrective Action and Operation and Maintenance Requirements**

The FFA parties divided the Heritage Center into two smaller operating units to facilitate site CERCLA decisions. The two operating units are Zone 1 (outside the main plant area) and Zone 2 (inside the main plant). The Former Powerhouse Area, Duct Island, and K-1007-P1 Pond Area is located within Zone 1. The Zone 1 Interim ROD was signed in October 2002, and the Zone 2 Interim ROD was signed on April 19, 2005; remedial actions for soils and sources of groundwater contamination in Zone 1 were completed in FY 2011, with the exception of the former K-770 Scrap Yard and the K-720 Fly Ash Pile, and are underway for Zone 2.

Located within some of the Zone 1 and Zone 2 EUs are sites designated as requiring special attention because they were listed in the FFA as having the potential for contamination. These FFA sites have been the focus of several remedial actions across the Heritage Center. Table 5.1 summarizes the regulatory status of the EUs in which the Former Powerhouse Area, Duct Island, and K-1007-P1 Pond Area is located.

OREM plans to address the key sources to the contaminated groundwater plumes at the site to ensure protection of human health and the environment. The decision for groundwater will also be made through the CERCLA process. The final Sitewide ROD will include groundwater and any needed remedial action. Any measures planned to address groundwater contamination are not expected to impact the Property.

In order to ensure the protection of human health by preventing exposure to contaminants present in the groundwater, the deed for the Property prohibits the extraction, consumption, exposure, or use, in any way, of the groundwater without the prior written approval of DOE, EPA, and TDEC. Additional provisions are included to prevent inadvertent exposure to contaminated groundwater and/or any contamination that could possibly be present in the soils. Such provisions include requiring adherence to applicable Federal, State, and local laws with respect to any development of the property.

Vapor intrusion will be addressed in the final Sitewide ROD, which will include groundwater. Any new building or structure built on the Property that will be occupied must be designed and constructed to minimize potential exposure of workers to VOC vapors, using EPA/625/R-92/016 (June 1994), *Radon Prevention in the Design and Construction of Schools and Other Large Buildings*, as guidance, as noted in Section 6.1 and in the Quitclaim Deed, Condition (11).

**Table 5.1. Former Powerhouse Area, Duct Island, and K-1007-P1 Pond Area Components and Summary of CERCLA Decisions**

<b>Geographic area</b>	<b>Group</b>	<b>EU (acreage)</b>	<b>Associated FFA sites</b>	<b>Decision<sup>a</sup></b>
K-1007 Ponds Area	Happy Valley Service Station	EU Z1-01 (28.3 acres)	S-21 Happy Valley Service Station	NFA for soils approved <sup>b</sup>
		EU Z1-02 (13.6 acres)	No associated FFA site	NFA for soils approved <sup>c</sup>
	K-1007 Ponds	EU Z1-05 (19.3 acres)	K-1007 Gas Tank (Residual Contamination)	NFA for soils approved <sup>c</sup>
			K-1048 Tire and Battery Shop	NFA for soils approved <sup>c</sup>
			K-1050 Wash, Paint, and Grease Shop	NFA for soils approved <sup>c</sup>
		EU Z1-06 (19.7 acres)	695/687 Oil Storage Operation	NFA for soils approved <sup>c</sup>
	J. A. Jones Group	EU Z1-07 (14.3 acres)	J. A. Jones Disposal Area	NFA for soils approved <sup>c</sup>
			Contractor's Road Study Area (#21c)	NFA for soils approved <sup>c</sup>
Powerhouse Area	Firehouse and Ash Pile Group	EU Z1-09 (25.4 acres)	K-1085 Old Firehouse Burn Area	NFA for soils recommended <sup>d</sup>
			K-1085 Old Firehouse Burn Area Burial Site	NFA for soils deferred to the Zone 1 Final ROD <sup>d</sup>
			J. A. Jones Maintenance Complex	NFA for soils recommended <sup>d</sup>
		EU Z1-10 (24.0 acres)	No FFA Sites	Sampling and analysis resulted in NFA concurrence <sup>c</sup>
	J. A. Jones Group	EU Z1-08A (31.5 acres)	Round House Road	NFA for soils approved <sup>c</sup>
			EU Z1-08B (14.6 acres)	Demolition Materials Placement Area
	J. A. Jones Group	EU Z1-07 (14.3 acres)	695/687 Oil Storage Operations	Sampling and analysis resulted in NFA concurrence <sup>c</sup>
			695/687 Oil Storage Operations	Sampling and analysis resulted in NFA concurrence <sup>c</sup>
Powerhouse Area	Firehouse and Ash Pile Group	EU Z1-09 (25.4 acres)	K-1085 Old Firehouse Burn Area	NFA for soils recommended <sup>d</sup>
			K-1085 Old Firehouse Burn Area Burial Site	NFA for soils deferred to the Zone 1 Final ROD <sup>d</sup>
		EU Z1-11 (78.4 acres)	K-720 Fly Ash Pile <sup>c</sup>	NFA recommended for soils in EU Z1-11. K-720 Fly Ash Pile decision on soil as source to groundwater deferred to Zone 1 Final ROD. <sup>d</sup>

**Table 5.1. Former Powerhouse Area, Duct Island, and K-1007-P1 Pond Area Components and Summary of CERCLA Decisions (cont.)**

<b>Geographic area</b>	<b>Group</b>	<b>EU (acreage)</b>	<b>Associated FFA sites</b>	<b>Decision<sup>a</sup></b>
Powerhouse Area (cont.)	Powerhouse North Group	EU Z1-12 through EU Z1-16 and EUs Z1-23, -24, -25, -34 and -35 (168.2 acres)	518 Main Substation	NFA for soils approved <sup>c</sup>
			Building 523 Grease Burial Site	NFA for soils approved <sup>c</sup>
			Building 526 Heavy Equipment Shop	NFA for soils approved <sup>c</sup>
			K-709 Storage Yard	NFA for soils approved <sup>c</sup>
			K-709 Switchyard Soils	NFA for soils approved <sup>c</sup>
		Powerhouse Knoll Study Area (#21a)	NFA for soils approved <sup>c</sup>	
	K-722 Area Roads Group	EU Z1-17 through EU Z1-22 and EU Z1-26	K-722 Area Roads Group	NFA for soils recommended <sup>d</sup>
			F-07 Materials Warehouse	NFA for soils recommended <sup>d</sup>
			F-08 Laboratory	NFA for soils recommended <sup>d</sup>
	K-770 Group	EU Z1-27, -28, -29, -30, -31, -32, and -33 (65.5 acres)	Bldg F-29 Gasoline Station	NFA for soils recommended <sup>e</sup>
K-725 Beryllium Building Soils			NFA for soils recommended <sup>e</sup>	
K-770 Scrap Metal Yard			NFA for soils recommended <sup>e</sup>	
K-770 Contaminated Debris			NFA for soils recommended <sup>e</sup>	
K-770 Cooling Tower Wood Debris			NFA for soils recommended <sup>e</sup>	
Duct Island	Duct Island South	Z1-36 (25.1 acres)	None	NFA for soils approved <sup>f</sup>
		Z1-37 (20.1 acres)	None	NFA for soils approved <sup>f</sup>
		Z1-38 (20.3 acres)	Duct Island Soil Mounds	NFA for soils approved <sup>b</sup>
	K-1070-F	Z1-39 (20.0 acres)	K-1070F Construction Spoil Area; Duct Island Road	NFA for soils approved <sup>f</sup> Land use controls to address Ducts.
		Z1-40 (20.0 acres)	Duct Island Study Area; Duct Island Road	NFA for soils approved <sup>f</sup> Land use controls to address Ducts.
		Z1-41 (5.0 acres)	K-1070-F Construction Spoil Area; Duct Island Road	NFA for soils approved <sup>f</sup>
		Z1-42 (19.8 acres)	K-1070-F Construction Spoil Area; Duct Island Road	NFA for soils approved <sup>f</sup>
		Z1-43 (15.0 acres)	Duct Island Road	NFA for soils approved <sup>f</sup>

**Table 5.1. Former Powerhouse Area, Duct Island, and K-1007-P1 Pond Area Components and Summary of CERCLA Decisions (cont.)**

<b>Geographic area</b>	<b>Group</b>	<b>EU (acreage)</b>	<b>Associated FFA sites</b>	<b>Decision<sup>a</sup></b>
Duct Island (cont.)		Z1-44 (21.1 acres)	Duct Island Road	NFA for soils approved <sup>f</sup>
	K-901 South	Z1-45 (21.4 acres)	None	NFA for soils approved <sup>f</sup>
		Z1-46 (20.4 acres)	None	NFA for soils approved <sup>f</sup>
		Z1-47 (5.1 acres)	K-901-A South Disposal Area	NFA for soils approved <sup>f</sup>

<sup>a</sup> Potential impacts to ecological receptors were not addressed in the decision documents for these EUs. Potential impacts to ecological risk, both within the transfer property and the adjacent property, will be addressed in the Zone 1 Final ROD. The East Tennessee Technology Park Sitewide ROD will evaluate risk from groundwater and surface water to human health and ecological receptors. The U.S. Department of Energy will remain responsible, regardless of property ownership, for providing the necessary response actions to address any residual contamination on the property to ensure protection of human health and the environment.

<sup>b</sup> NFA concurrence from approved *Fiscal Year 2008 Phased Construction Completion Report for Exposure Units Z1-01, Z1-02, Z1-38, and Z1-49 in Zone 1 at East Tennessee Technology Park, Oak Ridge, Tennessee*, DOE/OR/01-2367&D2 (DOE 2008).

<sup>c</sup> NFA concurrence from approved *Phased Construction Completion Report for the K-1007 Ponds Area and Powerhouse Area in Zone 1 at East Tennessee Technology Park, Oak Ridge, Tennessee*, DOE/OR/01-2294&D2 (DOE 2006a).

<sup>d</sup> NFA requested from the *Addendum to the Phased Construction Completion Report for the K-1007 Ponds Area and Powerhouse North Area in Zone 1, East Tennessee Technology Park, Oak Ridge, Tennessee*, DOE/OR/01-2294&D2/A1/R1 (DOE 2011a). The decision on the impact to groundwater for the K-720 Fly Ash Pile will be deferred to the East Tennessee Technology Park Final Sitewide Record of Decision. The need for additional actions for soils at the K-1085 Burn Area Burial Site is deferred to the Zone 1 Final ROD.

<sup>e</sup> NFA requested from the *Addendum II to the Phased Construction Completion Report for the K-1007 Ponds Area and Powerhouse North Area in Zone 1, East Tennessee Technology Park, Oak Ridge, Tennessee*, DOE/OR/01-2294&D2/A2 (DOE 2011b).

<sup>f</sup> NFA concurrence from approved *Phased Construction Completion Report for the Duct Island Area and K-901 Area in Zone 1, East Tennessee Technology Park, Oak Ridge, Tennessee*, DOE/OR/01-2261&D2 (DOE 2006b).

CERCLA = Comprehensive Environmental Response, Compensation, and Liability Act of 1980.

EU = exposure unit.

FFA = Federal Facility Agreement.

NFA = no further action.

## **6.0 Contents of Deed/Transfer Agreement**

This section includes the Quitclaim Deed clauses and/or exhibits required to enable EPA's determination under an industrial land use risk scenario that the property is suitable for transfer. The following items are included:

- a. Notice – A copy of the notice as required by CERCLA Section 120(h)(1) and (3) and in accordance with regulations set forth at 40 *Code of Federal Regulations (CFR)* Part 373;
- b. Covenant – A copy of the covenant warranting that any additional remedial action found to be necessary after the date of transfer shall be conducted by the United States as required by CERCLA Section 120(h)(3)(A)(ii)(II);

- c. Access – A copy of the clause that reserves the United States access to the property in any case in which an investigation, response, or corrective action is found to be necessary after the date of transfer as required by CERCLA Section 120(h)(3)(A)(iii); and
- d. Response Actions Assurances – A copy of the response action assurances that must be included in the deed or other agreement proposed to govern the transfer as required under CERCLA Section 120(h)(3)(C)(ii).

## **6.1 Background Introduction**

The Quitclaim Deed for the Property includes various prohibitions and restrictions intended to ensure that the proposed transfer is protective of human health and the environment.

The deed prohibits the use of the Property in a manner inconsistent with the land use assumptions of “industrial use.” Industrial use is defined by the Zone 2 ROD as potential exposure to surface conditions for 2,000 hours/year for 25 years. In addition, the deed specifically prohibits residential use, which includes residential housing, elementary or secondary schools, or any child care facility or children’s playground. Also, in accordance with the National Environmental Policy Act (NEPA) Environmental Assessment (EA), *Transfer of Land and Facilities within the East Tennessee Technology Park and Surrounding Area, Oak Ridge, Tennessee*, DOE/EA-1640, dated October 2011, industrial uses considered are the permitted principal uses and uses requiring a Board of Zoning Appeals permit in the City of Oak Ridge Zoning Ordinance for IND-1, IND-2, and IND-3, Industrial Districts. Additional commercial and recreational uses are those included in the Zoning Ordinance for UB-2, Unified General Business Districts.

Although the vapor intrusion potential, as described in Section 4.1, is not high, uncertainty remains due to the limited data available. Therefore, the deed requires that any buildings newly constructed on the Property, which are intended to be occupied by workers eight hours or more per scheduled work day or by public visitors, will be designed and constructed to minimize exposure to VOC vapors. To ensure the protection of human health from exposure to contaminants in groundwater plumes throughout the site, the deed prohibits the GRANTEE from extracting, consuming, or using, in any way, the groundwater underlying the Property without the prior written approval of DOE, EPA, and TDEC. Finally, the deed requires compliance with all applicable Federal, State, and local laws and regulations with respect to any development on the Property.

The deed excerpts shown in Section 6.2, below, are from the draft Quitclaim Deed for the Property.

## **6.2 Selected Excerpts from the Draft Quitclaim Deed Related to Protection of Human Health and the Environment**

THIS QUITCLAIM DEED, made between the UNITED STATES OF AMERICA, its successors, transferees and assignees, hereinafter referred to collectively as the GRANTOR, acting by and through the Secretary of the Department of Energy, under and pursuant to the powers and authority contained in Section 161g of the Atomic Energy Act of 1954, as amended (42 United States Code [U.S.C.] § 2201(g)), and the GRANTEE. The GRANTOR and GRANTEE have agreed that in order to assure enforceability of land use restrictions, this Quitclaim Deed, including all of its exhibits, shall serve as a Notice of Land Use Restrictions pursuant to Tennessee Code Annotated 68-212-225, having all the effectiveness and enforceability of such Notice. By acceptance of this Quitclaim Deed or any rights hereunder, the GRANTEE, for itself, its successors and assignees forever, agrees that the transfer of all the Property transferred by this Deed is accepted subject to all terms, obligations, restrictions, reservations, covenants and conditions set forth in this Quitclaim Deed and all exhibits hereto, and that these terms, obligations, restrictions, reservations, covenants and conditions shall run with the land.

(1). It is the intent of the GRANTEE to utilize the property conveyed herein for purposes consistent with the mission of economic development for the community. All activities and development of the real property by the GRANTEE shall be consistent with the requirements contained within Exhibits “B” and “D” to this Quitclaim Deed.

(9). The GRANTEE shall comply with all applicable Federal, State, and local laws and regulations with respect to any present or future development of the property herein conveyed, including, but not limited to, those laws and regulations which govern sewage disposal, facilities, water supply, and other public health requirements.

(10). All structures, facilities, and improvements requiring a water supply shall be required to be connected to an appropriate regulatory approved water system for any and all usage. GRANTEE covenants not to extract, consume, expose, or use in any way the groundwater underlying the property or water from any streams or ponds located on the property without the prior written approval of the GRANTOR, the U.S. Environmental Protection Agency and the Tennessee Department of Environment and Conservation.

(11). The GRANTEE covenants and agrees that any buildings intended to be occupied by workers eight hours or more per scheduled work day or by public visitors will be designed and constructed to minimize exposure to volatile organic contaminant vapors. The GRANTOR and the GRANTEE will determine the necessary building design features to minimize this potential exposure using OSWER 9200.2-154 (June 2015), *OSWER Technical Guide for Assessing and Mitigating the Vapor Intrusion Pathway from Subsurface Vapor Sources to Indoor Air*, as guidance.

(15). The GRANTOR acknowledges that the Oak Ridge Reservation has been identified as a National Priorities List Site under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980, as amended. The GRANTEE acknowledges that the GRANTOR has provided it with a copy of the Oak Ridge Reservation Federal Facilities Agreement (FFA), effective on January 1, 1992, and relevant amendments entered into by the GRANTOR, Region 4 of the United States Environmental Protection Agency, and the Tennessee Department of Environment and Conservation. The GRANTEE agrees that should any conflict arise between the terms of such agreement as it presently exists or may be amended and the terms of this Quitclaim Deed, the terms of the FFA will take precedence.

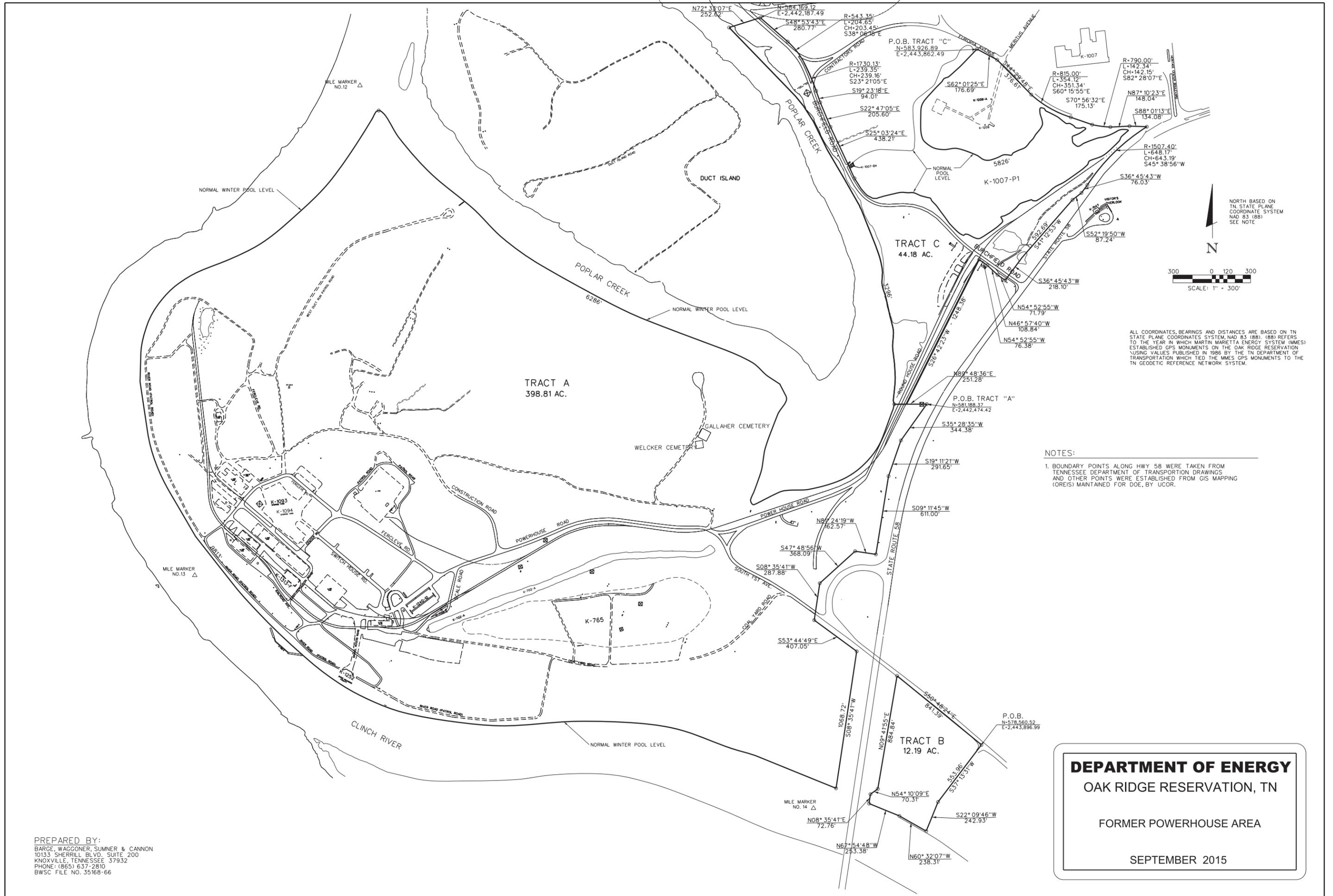
An Addendum addressing requirements of Section 120(h)(3), including response action assurances and use restrictions, is attached as Exhibit "D" and is made a part of this Quitclaim Deed and all provisions of that Addendum are fully incorporated herein.



EXHIBIT "A"  
TO QUITCLAIM DEED

SURVEY PLAT SHOWING THE TRANSFER FOOTPRINT





NORTH BASED ON  
TN STATE PLANE  
COORDINATE SYSTEM  
NAD 83 (88)  
SEE NOTE

300 0 120 300  
SCALE: 1" = 300'

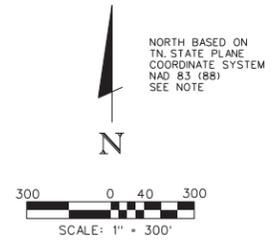
ALL COORDINATES, BEARINGS AND DISTANCES ARE BASED ON TN STATE PLANE COORDINATE SYSTEM, NAD 83 (88). (88) REFERS TO THE YEAR IN WHICH MARTIN MARIETTA ENERGY SYSTEM (MMES) ESTABLISHED GPS MONUMENTS ON THE OAK RIDGE RESERVATION USING VALUES PUBLISHED IN 1986 BY THE TN DEPARTMENT OF TRANSPORTATION WHICH TIED THE MMES GPS MONUMENTS TO THE TN GEODETIC REFERENCE NETWORK SYSTEM.

NOTES:  
1. BOUNDARY POINTS ALONG HWY 58 WERE TAKEN FROM TENNESSEE DEPARTMENT OF TRANSPORTATION DRAWINGS AND OTHER POINTS WERE ESTABLISHED FROM GIS MAPPING (OREIS) MAINTAINED FOR DOE, BY UCOR.

**DEPARTMENT OF ENERGY**  
OAK RIDGE RESERVATION, TN  
  
FORMER POWERHOUSE AREA  
  
SEPTEMBER 2015

PREPARED BY:  
BARGE, WAGGONER, SUMNER & CANNON  
10133 SHERRILL BLVD. SUITE 200  
KNOXVILLE, TENNESSEE 37932  
PHONE: (865) 637-2810  
BWSC FILE NO. 35168-66

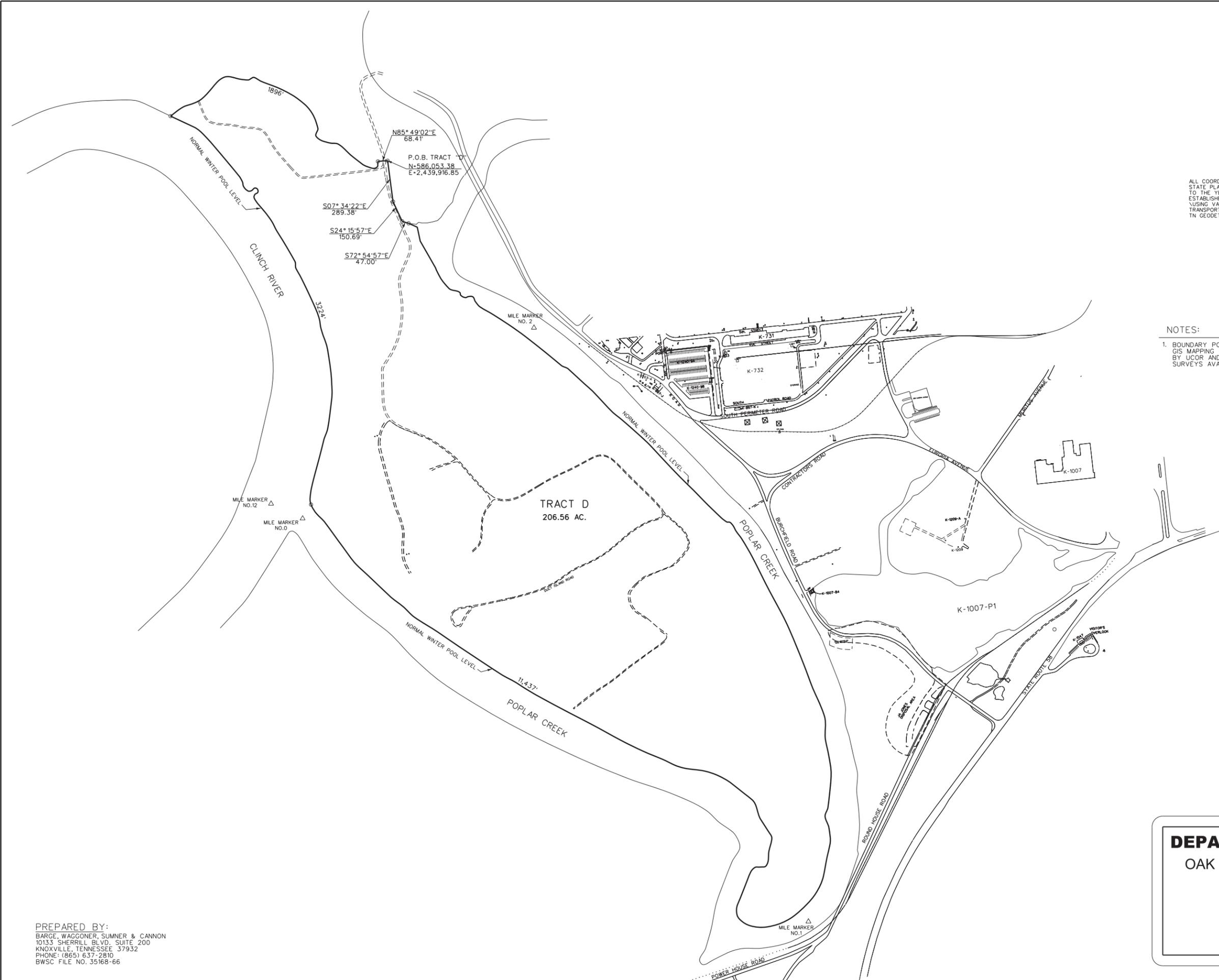




ALL COORDINATES, BEARINGS AND DISTANCES ARE BASED ON TN STATE PLANE COORDINATE SYSTEM, NAD 83 (88). (88) REFERS TO THE YEAR IN WHICH MARTIN MARIE TA ENERGY SYSTEM (MMES) ESTABLISHED GPS MONUMENTS ON THE OAK RIDGE RESERVATION USING VALUES PUBLISHED IN 1986 BY THE TN DEPARTMENT OF TRANSPORTATION WHICH TIED THE MMES GPS MONUMENTS TO THE TN GEODETIC REFERENCE NETWORK SYSTEM.

**NOTES:**

- BOUNDARY POINTS WERE ESTABLISHED FROM GIS MAPPING (OREIS) MAINTAINED FOR DOE BY UCOR AND OTHER BOUNDARY POINTS FROM SURVEYS AVAILABLE.



**DEPARTMENT OF ENERGY**  
 OAK RIDGE RESERVATION, TN

DUCT ISLAND AREA

SEPTEMBER 2015

PREPARED BY:  
 BARGE, WAGGONER, SUMNER & CANNON  
 10133 SHERRILL BLVD. SUITE 200  
 KNOXVILLE, TENNESSEE 37932  
 PHONE: (865) 637-2810  
 BWSC FILE NO. 35168-66



EXHIBIT "B"  
TO QUITCLAIM DEED

NATIONAL ENVIRONMENTAL POLICY ACT (NEPA)

ALLOWABLE USES OF THE REAL PROPERTY

In accordance with the Environmental Assessment *Transfer of Land and Facilities within the East Tennessee Technology Park and Surrounding Area, Oak Ridge, Tennessee*, DOE/EA-1640, dated October 2011, industrial uses considered are the permitted principal uses and uses requiring a Board of Zoning Appeals permit in the City of Oak Ridge Zoning Ordinance for IND-1, IND-2, and IND-3, Industrial Districts. Additional commercial and recreational uses are those included in the Zoning Ordinance for UB-2, Unified General Business Districts. These uses could include, but are not limited to, the following:

- Light to heavy processing, manufacturing, assembly, and fabrication plants, excluding slaughtering plants and paper or pulp mills.
- Public utility facilities with or without storage yards.
- Storage; wholesaling; distribution; warehousing, including shipping and freight terminals; and related facilities.
- Research and testing facilities, including renewable and advanced energy, industrial, and scientific research laboratories that include incidental pilot plant processing operations.
- Administrative, technical, and professional offices.
- Storage facilities for materials such as, but not limited to, salt, switch grass, other alternative fuel feedstocks, coal, coke, building material, sand, gravel, stone, lumber, and enclosed or open storage of construction contractors' equipment and supplies.
- Waste treatment facilities, including nonhazardous waste recycling centers, hazardous and mixed waste treatment for shipment to off-site storage and disposal facilities.
- Recycling operations, including those for radioactively contaminated materials and those associated with metal and other material treatment and processing.
- Bulk oil and gasoline storage or bulk storage of natural gas.
- Power plants, including renewable energy generation.
- Broadcasting, publishing, recording, and telecommunications.

- Food processing such as dairy products, bakery products, and beverage products (all activities are conducted in an enclosed building).
- Airports (additional NEPA review would be necessary).
- Commercial uses, including restaurants and service establishments such as: gas station/convenience store, bank, post office/ mailing/ shipping center, copying/printing, bulk cleaning and laundry, cold storage lockers, furniture and carpet warehouses, car washes, equipment and appliance repair, vehicle service centers, etc.
- Public recreation uses such as parks, historic legacy interpretation, playgrounds, golf courses, athletic fields, and stadiums.

EXHIBIT “D”  
ADDENDUM TO QUITCLAIM DEED

CERCLA SECTION 120(h) REQUIREMENTS AND ASSURANCES

A. In accordance with CERCLA Section 120(h)(1) and (3) and 40 *Code of Federal Regulations* Section 373, and based on a complete search of agency files, the GRANTOR provides notice that:

A contaminated groundwater plume has been identified in the subsurface of portions of the Former Powerhouse Area, Duct Island, and K-1007-P1 Pond Area. The volatile organic compounds (VOCs) trichloroethene, 1,2-dichloroethene, and vinyl chloride have historically been detected above their respective maximum contaminant levels (MCLs) in wells and springs located within the Property. The metals antimony, arsenic, cadmium, chromium, lead, selenium, and thallium, and gross alpha radioactivity have been observed historically to exceed their respective MCLs in some wells in the western portion of the Property. However, filtered groundwater samples have not exceeded MCLs in recent samples. The presence of VOCs, and historically metals, above MCLs in groundwater is considered a release of a hazardous substance on the Property.

The deed (Condition 10) includes a prohibition for use of the groundwater, in any way, unless such use is approved in advance by the GRANTOR, the U.S. Environmental Protection Agency (EPA), and the Tennessee Department of Environment and Conservation (TDEC). Additional provisions are included to prevent inadvertent exposure to contaminated groundwater and/or any contamination that could possibly be present in the soils. Such provisions include requiring the GRANTEE to adhere to applicable Federal, State, and local laws with respect to any development of the Property (Condition 9). Further information on the nature and extent of groundwater contamination is contained in Section 4.3 of the Environmental Baseline Survey (EBS) Report issued in **DATE TO BE DETERMINED**, which is incorporated by reference into this Quitclaim Deed as Exhibit F. Said Report shall be placed within the permanent historical realty audit files of the U.S. Department of Energy-Oak Ridge Office (DOE-ORO), within the GRANTOR’s Oak Ridge Office Information Center, and within the GRANTEE’S realty records. The Oak Ridge Office of Environmental Management (OREM) plans to address the key sources to the contaminated groundwater plumes at the site to ensure protection of human health and the environment. The decision for groundwater will be made through the CERCLA process. The final Sitewide Record of Decision (ROD) will include groundwater and any needed remedial action to address contaminated groundwater in Zone 1.

B. The GRANTOR warrants that any additional response action found to be necessary after the date of transfer for contamination on the Property existing prior to the date of this transfer will be conducted by the United States. The obligation of the United States under this warranty will be limited to the extent that a response action is required by an

act or omission of any GRANTEE which either a) introduces new contamination or b) increases the cost or scope of the required response action by negligently managing any contamination present on the Property at the time of the initial transfer by the United States.

C. The GRANTOR reserves a right of access to all portions of the Property for environmental investigation, remediation, or other corrective action. In the event the GRANTOR must access the Property, the GRANTOR must provide notice to and coordinate access with the GRANTEE, or its successors, and any authorized occupants of the Property. Any such entry, including such activities, responses, or remedial actions, shall be coordinated with the GRANTEE or its successors, assignees, and tenants and shall be performed in a manner which minimizes, to the extent practicable, interruption with the GRANTEE's activities on the Property. The GRANTOR's right to access the Property shall be exercisable in any case in which a response action or corrective action is found to be necessary by the GRANTOR, or applicable regulatory authority, after the date of conveyance of the Property, or in which the GRANTOR determines access is necessary to carry out a response action or corrective action on adjoining property. Pursuant to this reservation, the United States and its officers, agents, employees, contractors, and subcontractors shall have the right (upon reasonable notice to and coordination with the GRANTEE or the then-owner and any authorized occupant of the Property) at the direction of the GRANTOR to enter upon the Property and (1) conduct investigations and surveys, including but not limited to, sample collection, drilling, data and record compilation, and other activities related to environmental investigation; and (2) to carry out any other response and/or corrective actions as required or necessary under CERCLA and other applicable authorities, including but not limited to installation and operation of groundwater monitoring and/or restoration wells, and any treatment of hazardous substances or materials required under CERLCA and other applicable authorities.

D. The GRANTEE covenants that the Property shall not be used or developed in a manner inconsistent with the land use assumptions of "industrial use" contained in approved applicable RODs. The GRANTEE covenants that it will not at any time cause or allow any portion of the Property to be used for any residential housing, any elementary or secondary school, or any child care facility or children's playground.

E. The GRANTEE covenants that it will not at any time cause or allow any other use or disturbance of any portion of the Property located more than 10 feet below ground surface (bgs) level, or 2 feet bgs over the underground electrical duct bank and the K-770 Scrap Metal Yard, without having first obtained authorization from DOE's Excavation/Penetration Permit Program. Disturbance of the soils at the K-720 Fly Ash Pile is prohibited unless approval is obtained from DOE, EPA, and TDEC.

F. The GRANTEE covenants that it will not inhibit or hinder the GRANTOR from required remedial investigations, response actions, or oversight activities including, but not limited to, properly constructing, upgrading, operating, maintaining, and monitoring any groundwater treatment facilities or groundwater monitoring on the Property or

adjoining property. Further, the GRANTEE covenants that it will not tamper with or willfully destroy any monitoring wells or other monitoring or remediation systems that may be located in the vicinity of the Property.

G. The GRANTEE will not remove any signs placed by the GRANTOR that are required for regulatory compliance (e.g. CERCLA land use controls) and will also comply with the conditions as stated on such signs.

H. The GRANTOR shall submit on an annual basis, through established channels, appropriate budget requests to the Director of the Office of Management and Budget that adequately address those agreed upon schedules for investigation and completion of all necessary response actions required by the Federal Facilities Agreement (FFA) until such time that all necessary remedial action has been taken. The actual amount available for such activities is subject to congressional authorizations and appropriations.

I. When all response actions necessary to protect human health and the environment with respect to any substance remaining on the Property on the date of transfer have been taken, the United States shall execute and deliver to the transferee an appropriate document containing a warranty that all such response actions have been taken.

J. After notice and coordination with the GRANTEE as set forth in Item C, above, any response actions taken by the GRANTOR will be in accordance with schedules developed and included in Appendix E and J of the FFA for the Oak Ridge Reservation, approved by the GRANTOR, Region 4 of the EPA, and TDEC. The GRANTOR will take all necessary action to remediate the East Tennessee Technology Park (ETTP), including groundwater contamination where applicable. The schedule for completion of the remedial action activities addressing Zone 1 of the ETTP Heritage Center, and the groundwater (to be addressed in the final Sitewide ROD), is set forth in the following milestones which are subject to adjustment through amendment pursuant to Chapter XVIII, *Scoping Work Priorities* of the FFA:

Zone 1 Final Record of Decision

Interim Record of Decision – November 8, 2002  
Final Record of Decision – September 2016  
Completion of Remedial Action – April 2019

Final Sitewide Record of Decision

Final Record of Decision – projected 2023  
Completion of Remedial Actions – TBD



EXHIBIT "F"  
TO QUITCLAIM DEED

ENVIRONMENTAL BASELINE SURVEY REPORT

The Environmental Baseline Survey Report for the Former Powerhouse Area, Duct Island, and K-1007-P1 Pond Area was issued in **DATE TO BE DETERMINED**, by the GRANTOR. Said Report is incorporated by reference to this Quitclaim Deed as noted in Exhibit D, Paragraph A.



## **7.0 Responsiveness Summary**

The Covenant Deferral Request (CDR) and Environmental Baseline Survey (EBS) were issued in draft form for regulator review on September 29, 2015. A written response was received from the Tennessee Department of Environment and Conservation (TDEC) on October 23, 2015. Comments were received from the U.S. Environmental Protection Agency (EPA) Region 4 on December 22, 2015. Additional comments from EPA Region 4 were received on January 8, 2016. These comments and DOE's responses are presented below.

### **7.1 Regulator Comments**

#### ***EPA Review Comments on the Environmental Baseline Survey Report for the Proposed Transfer of the Former Powerhouse Area, Duct Island and K-1007-P1 Pond Area at the East Tennessee Technology Park (DOE/OR/01-2685, Draft)***

##### **General Comments**

1. Please ensure that figures of all exposure units identified in this Environmental Baseline Survey Report (EBS) are included and can be easily referenced with the associated text. It appears that some figures are not included that will assist in describing the EU locations and associated sampling activities.

***DOE RESPONSE:*** *A large fold-out map has been added to the EBS Report for reference that shows the transfer footprint, the EU boundaries, and all of the DVS soil samples that have been collected from the EUs included in the transfer.*

2. The EBS should be organized to minimize the back and forth referencing that is necessary in the current configuration in order to understand the location, operational history, sampling activity, analytical results presentation, and the evaluation of residual risks for the large number of EUs and EU Groups. The information is critical to Sections 4, 5, and 6 of the document.

***DOE RESPONSE:*** *See response to General Comment #1. The fold-out map provides a single source for identifying the EUs, soil sample locations, and other physical features being discussed in the various sections of the EBS Report. An additional figure indicating the EU Groups has also been added to the EBS Report.*

3. Data associated with this EBS should be included in the document to allow an evaluation of the contaminants and the values resulting from analysis.

***DOE RESPONSE:*** *The data collected and the evaluation of those data, to ensure that the Remedial Action Objectives (RAOs) under the approved Zone 1 Interim Record of Decision (ROD) are satisfied, are presented in detail in the Phased Construction Completion Reports (PCCRs), which are submitted to EPA*

and TDEC for review and approval. These data are also available in OREIS. The EBS Report references these PCCRs as the foundational basis to support the transfer of the property for industrial use. All of the EUs included in the proposed transfer footprint addressed by the EBS Report have met the Zone 1 ROD RAOs for soils, and all of these EUs have received EPA and TDEC approval for No Further Action (NFA), except for the EUs covering a portion of the Former K-770 Scrap Yard Area, which are awaiting a final decision on the remedial action to address asbestos remaining in soils. Sections 6 and 7 of the EBS Report are intended to provide a summary of the data and human health risk evaluation presented in detail in the PCCRs; re-evaluation of these data in the EBS Report is unnecessary and would undermine the purpose of the PCCRs.

4. Although the Zone 1 Interim ROD required a comparison of the contaminants to the Preliminary Remediation Goals (PRGs) for chemicals, the EPA is now using the Regional Screening Levels (RSLs). The residual risk from contaminants of concern should also be compared to RSLs.

**DOE RESPONSE:** See response to General Comment #3. The EBS Report relies on the Zone 1 Interim ROD, which is the approved decision document for Zone 1 soils, and the data evaluation presented in the referenced PCCRs as the foundational basis for the justification that the property is appropriate for transfer for industrial use. Re-evaluating the data in the EBS Report is unnecessary and would undermine these other decision documents.

5. The EBS indicated that soils under the K-1313-F Building Slab will be characterized by DVS and cleaned up to the remediation levels (RLs) in the Zone 1 ROD, by which the document means the RLs in the Zone 1 Interim ROD. The document should describe the RLs in the Zone 1 Final ROD and how they will be used and distinguish whether RLs identified during implementation of the Zone 1 Interim ROD compared to the Zone 1 Final ROD.

**DOE RESPONSE:** The RLs for the Zone 1 Final ROD are identical to the Zone 1 Interim ROD RLs. The final disposition of Building K-1313-F is undetermined at this time. If Building K-1313-F is demolished, the RLs will be used to evaluate the data obtained for the slab and/or land underlying the building to ensure the Zone 1 Final ROD RLs for soils are met prior to transfer of the land underlying the building.

6. Text describing the 2011 groundwater modeling for the K-720 Fly Ash Pile indicated none of the leaching metals would migrate to the downgradient receptor location, the Clinch River. The DOE should be aware that the groundwater is a natural resource that should be protected at all locations. Please correct or remove this text.

**DOE RESPONSE:** *Comment noted. This statement is the summary statement from an approved PCCR and does not affect the potential transfer of the property.*

7. The EBS should provide information on the depth of groundwater beneath the EUs subject to the potential transfer and any DNAPL source areas. The information will assist in understanding contaminant transport and the potential for vapor intrusion.

**DOE RESPONSE:** *The last sentence of the first paragraph on page 4-32 states the range of potential depth to groundwater over the proposed transfer footprint. The wide range of topographic relief and varying hydrogeologic conditions across this large parcel of land preclude identifying specific depths to groundwater everywhere on the property. No DNAPL sources are present within the proposed transfer footprint.*

8. Where slabs/pads remain, the text should indicate these structures will be subject to the recently developed protocol for evaluation and completing any response measures prior to transfer.

**DOE RESPONSE:** *Additional text related to the protocol recently developed for the slabs/pads has been added where appropriate. The property will not be transferred until the slabs/pads have been addressed.*

### **Specific Comments**

1. **Executive Summary:** This section and each specific geographical reference should describe the type(s) of subsurface infrastructure elements that remain (e.g., water lines, storm drains, etc.) within the soil zone, even below 10 feet. It is important for the public and prospective transferee to know the extent of contamination other than basements that are present. These items should be a standard part of the EBS evaluation.

**DOE RESPONSE:** *The underground utilities are shown on the large fold-out map that has been added to the document, and key subsurface structures are discussed in the appropriate sections.*

2. **Executive Summary:** The Executive Summary should also reference approved No Further Action determinations in those areas where the Phased Construction Completion Reports (PCCRs) were not approved but may have been identified in concurrence forms. A generic reference may be appropriate. The current use of the methodology stated in this Environmental Baseline Survey Report addressing the Environmental Management evaluation should be identified as not being reviewed or approved by the Environmental Protection Agency or the Tennessee Department of Environment and Conservation (TDEC).

**DOE RESPONSE:** *No Concurrence Forms have been used to identify NFA determinations in the transfer footprint. The methodology used in the EBS Report has been revised to only use the approved DVS process for NFA determinations.*

3. Page xv, Executive Summary: Please correct the identification of the PCCRs that are approved. The *Addendum to the Phased Construction Completion Report for the K-1007 Ponds Area North Area in Zone I, East Tennessee Technology Park* (DOE/OR/01-2294&D2/AI/R1) was approved by the EPA via letter dated December 20, 2011. Please note that the DOE subsequently transmitted an erratum to the above-referenced document. The erratum was dated April 11, 2012, and addressed the corrected costs for the K-1085 Old Firehouse Burn Area.

**DOE RESPONSE:** *Identification of the approved PCCRs has been corrected.*

4. Page xvii, Executive Summary: In the first line of this page, please change the word "would" to "will."

**DOE RESPONSE:** *Requested change has been made.*

5. Page xviii, Executive Summary: In next to the last paragraph, the text is not clear that the area containing K-720 Fly Ash Pile is subject to engineering controls applicable to the transfer. Please expand the text to include this discussion.

**DOE RESPONSE:** *Text has been revised to explain that the soil cover will be maintained by DOE following the property transfer.*

6. Page 1-1, Section 1, Property Identification: Please include in paragraph 2 a reference to the 80 exposure units contained in the Zone 1 Interim ROD. This information could be inserted in a sentence before the sentence describing Figure 1.3. Additionally, it is more appropriate to reference the current CERCLA decision for Zone 1 as the Zone 1 Interim ROD, which only addressed soils and the impact on human health, as there will be a follow-on final ROD for soils only. The follow-on Zone 1 ROD will address the ecological risk of exposure to soils.

**DOE RESPONSE:** *Additional text has been added to clarify that 80 EUs are addressed by the Zone 1 Interim ROD, which addressed human health risk from soils, and that the Zone 1 Final ROD will address both human health and ecological risk from soils.*

7. Pages 1-2 and 1-3: In Figures 1.1 and 1.3, it appears that not all of the symbols identified on the figures are indicated in the legends. For example, in Figure 1.1, a fence is indicated in the center bottom and some aspect of property designation

is also present as indicated by a solid line running somewhat parallel to the transfer footprint and perpendicular to the fence. A gravel road also appears to be present but the legend reference does not provide clarity to that concern. In Figure 1.2, due to the difference in the legend references, it is difficult to delineate and compare to the previous figure. Please revise the figures and legends to allow for ease of reference to similarly identified structures.

Also, please clarify the boundary of EU Z1-02 and confirm the inclusion in the DQO package developed by the Core/Project Team addressed areas across the Oak Ridge Turnpike. Please correct the figure's boundary and ensure consistency for other graphical representations of the EUs subject to the Zone 1 Interim ROD.

**DOE RESPONSE:** *These figures have been revised to identify all symbols in the legend and line weights revised to be consistent between these two figures. The boundary of EU Z1-02 is the boundary as drawn in the DQO package developed by the Core/Project Team, and is the boundary shown in the Zone 1 Interim ROD. Although the Zone 1 EU Z1-02 boundary does cross Highway 58, the transfer footprint does not extend across the highway.*

8. Page 1-4, Figure 1.3: The legend indicates that NFA is appropriate for some EUs. However, some EUs have not met the land use controls to protect the industrial worker to 10 feet below ground surface. The legend should appropriately indicate the current status of those EUs. Please revise the legend to appropriately indicate the current status of those EUs since an early action has not been approved. The text is also problematic due the proposed areas with engineered controls and with wastes remaining at the time of transfer.

**DOE RESPONSE:** *Figure 1.3 has been revised to indicate that the status of the EUs with asbestos remaining in subsurface soil is "To Be Determined." The property will not be transferred until a final remedy has been approved and implemented. Deed restrictions will be included addressing LUCs. DOE retains responsibility to maintain the LUCs for these areas.*

9. Page 1-4, Figure 1.3: This figure does not identify the area of the K-720 Fly Ash Pile boundary that may have limitations due to the soil cover and will need to be maintained. The DOE should re-evaluate the suitability of transferring this property and reflect the limited areas, where appropriate, and reference on this figure.

**DOE RESPONSE:** *The K-720 Fly Ash Pile location is identified on this figure, which is illustrating the EU status. The footprint of the soil cover over the Fly Ash Pile is indicated on Figure 3.3, which shows the areas with restrictions on land use. Although DOE intends to transfer this property, DOE retains the responsibility to maintain the soil cover and enforce all LUCs related to the Fly Ash Pile.*

10. Page 4-24: Text indicated that the K-1007-P1 Pond was progressing well toward the desired end state of a heavily vegetated, clear water pond, dominated by sunfish, with significantly diminished, or at least downwardly trending, PCB levels. However, the K-1007-P1 Pond has yet to reach the desired end state of a pond dominated by sunfish. Undesirable fish species, such as gizzard shad, have taken hold in number. The pond might stabilize to a state other than the design end state. The design of the remedy for the pond was intended to exclude fishes that uptake PCBs. The PCB concentrations in the whole-body sunfish samples appear to have leveled off above the cleanup goal. The EBS does not discuss the ongoing requirement for control of Canada geese by allowing tall vegetation to grow around the pond. Restriction of mowing is required to maintain protectiveness. It is not clear who will be responsible for the ongoing maintenance of the pond. Land use restrictions regarding mowing, stocking with fish, and other restrictions on the use of the pond should be included in the CDR.

**DOE RESPONSE:** *The K-1007-P1 Pond is not part of the transfer, which is the reason it is discussed in Section 4.2 addressing activities for adjacent property. Additional text has been added to indicate the Pond is not included in the transfer. Land use restrictions regarding mowing, stocking with fish, and other restrictions will remain DOE's responsibility and have been added to the CDR.*

11. Page 3-2, Section 3.2: Please correct the entry for the fourth bullet to indicate the approval of the referenced PCCR (DOE/OR/01-2294&D2/A1/R1). The EPA approved this document on December 20, 2011.

**DOE RESPONSE:** *The bullet has been corrected.*

12. Page 3-4, Table 3.1: Please include in the table the reference(s) that ecological impacts were not included in the evaluation of the listed geographical areas, with emphasis on areas within the Powerhouse, Duct Island, and K-1007-P1 Pond areas where ecological concerns will be evaluated and implemented under the pending Zone 1 Record of Decision.

**DOE RESPONSE:** *A footnote has been added to the table to indicate that ecological impacts have not been addressed, but will be addressed in the Zone 1 Final ROD, and additional potential impacts from groundwater and surface water will be evaluated in the ETPP Sitewide ROD.*

13. Page 3-4, Table 3.1: The information for the K-1085 Old Firehouse Burn Area Burial Site states that a "NFA was recommended." This is true for the K-1085 Old Firehouse Burn Area; however, a NFA recommendation was not made for the K-1085 Old Firehouse Burn Area Burial Site. Please refer to page 23 of the *Addendum to the Phased Construction Completion Report for the K-1007 Ponds Area and Powerhouse North Area in Zone 1* (DOE/OR/01-2294&D2/A1/R1). This document was approved by the Environmental

Protection Agency on December 20, 2011, with an erratum to the approved document issued by the DOE dated November 28, 2011, addressing an error in the approved PCCR. On page 23 of the approved PCCR, the text references the need for an additional remedial action and is “deferred (DOE 2008) to the Zone 1 Final ROD.” Please correct the table for this entry.

**DOE RESPONSE:** *Table 3-1 has been revised to indicate that the need for additional remediation at the K-1085 Burn Area Burial Site is deferred to the Final Zone 1 ROD.*

14. Page 3-6, Paragraph 1: Please correct the reference to the 10 foot dig restriction to reflect “maximum” and not minimum. The Zone 1 Interim ROD specifies the depth restriction to protect human health is to 10 feet, which is the evaluation used in the CERCLA context.

**DOE RESPONSE:** *Text revised as requested.*

15. Page 3-12 and page 3-13: Demolition activities for the K-25 Building were completed in 2013. The K-25 Purge Cascade is identified on page 3-12 and the entire building is reflected on page 3-13. If possible, include more recent or reflective photographs of these areas, since the demolition of Building K-25.

**DOE RESPONSE:** *These aerial photographs have been replaced with the most recent available, which shows demolition has been completed on the K-25 building.*

16. Page 4-1, Section 4, Past and Present Activities: Please ensure consistency in the information being communicated for the DOE operations, CERCLA investigations and remedial actions taken, if any. This includes the presence and evaluations of remaining building slabs and asphalt pads.

**DOE RESPONSE:** *Text has been added for clarification with respect to the remaining slabs. All of the slabs within the transfer footprint (and for all of Zone 1) were previously evaluated as part of Zone 1 DVS. However, there is the potential for residual radioactive contamination to be present on slabs that are below Zone 1 RLs for soils, slabs, and subsurface structures, but above free-release levels found in DOE Order 458.1. Additional evaluation of potentially contaminated slabs will be performed to include radiological surveys to ensure that all slabs within the transfer footprint meet free-release levels and are managed accordingly (including down-posting as appropriate) prior to submission of the Final CDR for EPA and TDEC approval.*

17. Page 4-1, Section 4, Past and Present Activities: For each of the Former Powerhouse Area, Duct Island, and K-1007-P1 Pond subsections, it would be helpful to include the total acreage present for the EUs. The Technical Memoranda identify the acreage for each of the EUs contained in each

geographical subgroup. Including a tabular reference with the acreage will assist in greater understanding of the information being conveyed for each of the sub-geographical groups. For example, Powerhouse North Group of EUs includes EU ZI-12 (13.9 acres), EU 21-13 (26.7 acres), etc. As an alternative including the acreage with the specific EU designation will also benefit the reader. For example, K-722 Area Road Group includes EU ZI-17 (4.6 acres), EU ZI-18 (7.2 acres), etc. However, the designations of the Federal Facility Agreement (FFA) sites should continue to be distinctly identified.

**DOE RESPONSE:** *A new figure (Figure 3.1) has been added to Section 3 showing the EU Groups. The subgroups have also been identified on the new fold-out map of the transfer footprint. The acreages for either individual EUs or EU Groups are included in Table 3-1, and a reference to this table has been added to the text in this section.*

18. Page 4-6, K-1085 Old Fire House Burn Area Burial Site: Please include the depth of the soil excavation for this action. The completion and approval of the time-critical removal action should be specified. Additionally, this section should identify the future planned Remedial Action in the area as specified in the approved PCCR for this action, even though this remedial action will most likely be limited to groundwater. See Comment #11 above. Please add the need to conduct additional RA in the area as stated in the approved document titled, *Addendum to the Phased Completion Report for the K-1007 Ponds Area and Powerhouse North Area in Zone 1, East Tennessee Technology Park, Oak Ridge, Tennessee* (DOE/OR/01-2294&D2/A1/R1), even though this remedial action will most likely be limited to groundwater.

**DOE RESPONSE:** *Text has been added to include the following information: DOE conducted a time-critical removal action at the K-1085 Firehouse Burn Area Burial Site between July and October 2001. Conditional approval of this action was received in February 2003, and final approval for this action was received in January 2007. Additional soil removal under the DVS was performed in 2007. Soils were excavated to a depth of 12 feet during this remedial action, and site restoration was completed in 2008. The possibility for further remedial actions at this site was deferred to the Zone 1 Final ROD.*

19. Page 4-7, K-720 Fly Ash Pile: The text should clarify whether the action implemented in 2011 was to return the area to be compliant with the National Pollutant Discharge Elimination System (NPDES) or as a CERCLA remedial action. The text should present information of the type activity (NPDES or CERCLA) and the date the action was conducted. If the additional soil was added based on CERCLA, please include the date the CERCLA action was approved and implemented. If the action was approved via a concurrence form, please state the date of approval and include in the CDR.

**DOE RESPONSE:** *Additional discussion on the actions taken at the Fly Ash Pile has been added to indicate that the initial action was performed under the Clean Water Act (NPDES), and was not a CERCLA action. Additional soil cover was placed on the fly ash pile in June 2011 as a voluntary CERCLA remedial action in anticipation of the Final Zone 1 ROD.*

20. Page 4-8, Powerhouse North EU Group: For the summaries contained in this section, please include the results of the CERCLA evaluation and actions implemented. If no actions were implemented, please include this information as well.

**DOE RESPONSE:** *Additional text has been added to these descriptions indicating the remediation, if any, which has been performed in the EU Group.*

21. Page 4-8, Paragraph 3: It appears the last sentence was not completed. Please complete the last sentence beginning with “Some cutting...”

**DOE RESPONSE:** *This sentence has been revised.*

22. Page 4-11, Figure 4.7: Please use a picture that is more closely aligned with the completed action for the approved scrap removal action and the approved document to depict the geographical area.

**DOE RESPONSE:** *This figure was intended to provide a historical view of the Powerhouse Area. A more recent photo has also been added.*

23. Page 4-12, Paragraph 4: Please confirm and state whether the remaining subsurface structure of Building K-726 has been evaluated under the Zone 1 Interim ROD. If not, the DOE Environmental Management Program needs to project the evaluation and subsequent action for the structure.

**DOE RESPONSE:** *The Building K-726 Pad has been demolished and all subsurface structures were evaluated under the DVS and found to meet the Zone 1 ROD requirements for industrial use.*

24. Page 4-21: In paragraph 1, reference is made to the K-711 Storage Warehouse. Text should be added to state the actions taken to address the stored material and soils in and around the K-711 Storage Warehouse.

**DOE RESPONSE:** *This discussion has been revised to indicate that the K-711 Storage Warehouse has been demolished and the remaining concrete pad has been evaluated under the Zone 1 DVS.*

25. Page 4-21, Duct Island South EU Group: Please include text that addresses the planned ecological remedial actions that will be implemented for the EUs in this geographical group.

**DOE RESPONSE:** *There are no ecological remedial actions planned for the EUs included in this Group.*

26. Page 4-22, K-1070-F EU Group, Paragraph 1: Please describe CERCLA remedial actions conducted in these EUs.

**DOE RESPONSE:** *Text has been added to indicate that two minor soil removals will be performed for protection of ecological resources.*

27. Page 4-22, K-901-A South: The EUs referenced do not encompass all of the EUs that are included in that designation. Please add EU ZI-48 to this group. The text should also include an operational history of the EU, an environmental description, etc.

**DOE RESPONSE:** *The EUs listed represent the EUs included in the proposed transfer footprint and not the total EUs in the Group, as this section addresses the activities for the land proposed for transfer.*

28. Page 4-28, Section 4.3, Paragraph 4: Please describe the impact on data collection from the plugged and abandoned wells; provide information on whether any well replacements were installed to collect data due to the questionable well construction of those that were plugged and abandoned and the impact on data collection for environmental evaluations.

**DOE RESPONSE:** *Text has been added to explain that other wells exist in these areas and that these wells were plugged and abandoned, in part, due to the absence of contamination at these locations.*

29. Page 4-29, Section 4.3, Paragraphs 3 and 4: Although this EBS is based on soils within Zone 1, please describe DOE actions to address the potential continuing Tc-99 releases associated with the K-25 contamination and the impact on the K-1007-P1 Pond and the TCE at the K-1070-F Old Contactor's Burial Ground.

**DOE RESPONSE:** *Text has been added to indicate the identification of Tc-99 in groundwater north of the proposed transfer footprint; however, Tc-99 has not been detected in groundwater in the vicinity of the transfer footprint. The K-1007-P1 Pond is not included in the transfer footprint. This section of the EBS Report states that a decision on groundwater remediation, which includes groundwater at K-1070-F, will be made in the ETPP Final Sitewide ROD.*

30. Page 4-31, K-770 Scrap Yard, Paragraph 1: Please identify the probable source of the Tc-99 contamination found in the area and the impact on the soils of the beta-emitting radionuclide.

**DOE RESPONSE:** *Text has been added to indicate that the probable source of the Tc-99 found in groundwater was the contaminated scrap that historically*

*occupied the area, and the Tc-99 is highly mobile in ETP groundwater and unlikely to impact soils through adsorption. The soils of the K-770 Scrap Yard were evaluated under the DVS and these EUs meet the requirements of the Zone 1 ROD for industrial use.*

31. Page 5-1, Section 5.1, Last paragraph: The water-reactive material stored in Building K-1313-F may pose a risk to human health and the environment. Text should clarify this area as being within the footprint of the proposed transfer, although this may have been referenced previously in the document.

**DOE RESPONSE:** *Text has been added to describe the presence of the building in the footprint and current condition. The building will not be transferred unless the materials are removed and the building is found to be appropriate for transfer.*

32. Page 5-2, Section 5.1, Paragraph 2: The EBS should provide definitive information regarding the presence of the culvert near the K-720 Fly Ash Piles and the beaver dam ponds.

**DOE RESPONSE:** *This sentence has been revised to indicate that a culvert does exist under the road.*

33. Page 5-2, Section 5.1, Paragraph 3: The pad identified from the former K-709 Storage Yard (Page 5-8, Figure 5.13) should be subject to the slab protocol for evaluation that was recently negotiated.

**DOE RESPONSE:** *The slab protocol was developed for areas in Zone 2 where building D&D has occurred but where slabs remain that have not yet been evaluated. All of the slabs within the transfer footprint (and for all of Zone 1) were previously evaluated as part of the Zone 1 DVS. However, there is the potential for residual radioactive contamination to be present on slabs that is below Zone 1 RLs for soils, slabs, and subsurface structures but above free-release levels found in DOE Order 458.1. Additional evaluation of potentially contaminated slabs will be performed to include radiological surveys to ensure that all slabs within the transfer footprint meet free-release levels and are managed accordingly (including down-posting as appropriate) prior to submission of the Final CDR for EPA and TDEC approval.*

34. Page 6-1, Section 6, Sampling Results: As the EBS should be a stand-alone document, data associated with the EBS should be included for reference. Additionally, the identity and the highest values of the contaminant(s) detected for each of the referenced EUs should be included in each EU section. This information will aid and assist the reader in comprehending the extent of contamination present in the proposed transfer footprint. Figures of each EU that are subject to this EBS should be included. Some figures of EUs figures are presented with sample locations identified and a legend for sample types

(e.g., historic, base program samples, biased, etc.). For consistency, please modify the EBS to present this level of sample information. The information helps explain the referenced text and supports the findings described, particularly for Dynamic Verification Strategy (DVS) samples collected.

For each EU described in the EBS, please identify and include the exceedance value(s) identified and evaluated across the EU. Additionally, an evaluation of background exceedances should also be evaluated, particularly where the contaminant is determined to be associated with DOE operations. This evaluation is critical to describe impacts to the EU and that portion of the EU that is/is not within the transfer footprint.

**DOE RESPONSE:** *The data collected and the evaluation of those data, to ensure that the RAOs under the approved Zone 1 Interim ROD are satisfied, are presented in detail in the PCCRs, which are submitted to EPA and TDEC for review and approval. These data are also available in OREIS. The EBS Report references these PCCRs as the foundational basis to support the transfer of the property for industrial use. All of the EUs included in the proposed transfer footprint addressed by the EBS Report have met the Zone 1 ROD RAOs for soils, and all of these EUs have received EPA and TDEC approval for No Further Action (NFA), except for the EUs covering a portion of the Former K-770 Scrap Yard Area, which are awaiting a final decision on the remedial action to address asbestos remaining in soils. Sections 6 and 7 of the EBS Report are intended to provide a summary of the data and human health risk evaluation presented in detail in the PCCRs; re-evaluation of these data in the EBS Report is unnecessary and would undermine the purpose of the PCCRs. A large fold-out map of the EUs in the transfer footprint and all of the DVS sample locations within these EUs has been added to the EBS Report. The data evaluation for the EUs included in the transfer footprint, including the maximum concentrations and a screening against background concentrations, is presented in detail in the PCCRs.*

35. The EPA has not approved nor evaluated the data for the DOE area-weighted averaging to determine a human health exposure risk and applying that principal to less than the entire exposure unit. The entire EU is to be used in the evaluation of risk due to contamination found as a result of sampling. This approach is defined in the approved *Remedial Action Work Plan for Dynamic Verification Strategy for Zone 1, East Tennessee Technology Park, Oak Ridge, Tennessee* (DOE/OR-01-2182&D4). Utilizing a methodology that has been approved for an entire EU does not necessarily indicate less risk or exposure when applied to a smaller area, when the data have not been provided for review.

**DOE RESPONSE:** *DOE agrees with the use of the entire EU for the purposes of evaluating risk, and the appropriate text has been revised to present the risk evaluation for the entire EU in the affected sections of the CDR and EBS Report.*

36. Page 6-1, Paragraph 1: The last line in the paragraph states that DOE has determined that NFA is appropriate for the soils in the identified EUs. These EUs are contained in a PCCR that has not been approved by the regulators. The reference to the NFA should be conditioned upon the evaluation of residual soil risks to human health and the environment and the pending Final Zone 1 ROD. These areas cannot be transferred when remedial action is planned.

**DOE RESPONSE:** *Text has been added to indicate that the EUs have not received regulator approval because of the remaining asbestos in the soils, but that these EUs meet the requirements of the Zone 1 ROD. The property will not be transferred until implementation of the required remedial actions is complete, and the appropriate Land Use Controls have been established.*

37. Page 6-2, Figure 6.1: Please compare the EU Z1 boundary in this figure and that established during the Data Quality Objectives (DQO) planning. The EU boundary appears to cross Highway 58, which was not included in the original DQO planning. Where the EU and transfer boundaries are dissimilar, provide a graphic to distinguish the two boundaries, where applicable. Please ensure this issue is addressed for each EU that is subject to this EBS with appropriate scale.

**DOE RESPONSE:** *The Zone 1 boundary indicated on all CDR and EBS Report figures is the boundary as indicated in the appropriate DQO documents and in the Zone 1 Interim ROD. Although the EU Z1-02 boundary does cross Highway 58, the transfer footprint does not extend across the highway.*

38. Page 6-3, EU 21-02: In paragraph 1, please describe the anthropogenic features present in this EU. The description of all anthropogenic features should be described, if present in any EU subject to this EBS.

**DOE RESPONSE:** *Additional description of the anthropogenic features of this EU has been added.*

39. Page 6-3, EU Z1-05: Please see Specific Comments #33 and #34. The EBS only addresses a portion of this EU. The acreage that is applicable should be identified. A figure should be included to distinguish the boundaries specified in the ROD and the implemented DVS methodology that is subject to this EBS, with sample locations. This will assist in identifying that portion of the EU not being considered in the transfer footprint. The EPA cannot support this area-weighting method used for the DOE evaluation or the conclusions made for this EU regarding a risk to human health, especially when the average remediation level for the radionuclide Cs-137 was exceeded in the EU. Provide specific data to demonstrate the conclusion made in the text.

**DOE RESPONSE:** *The new fold-out map, which has been added to the EBS Report, shows the EU boundaries, the property transfer boundary, and the DVS sample locations within the transfer footprint. As discussed in response to Comment #35, the EBS Report has been revised to present the approved EU risk*

*evaluation for the partial EUs included in the transfer footprint. EU ZI-05 has received EPA and TDEC approval for NFA for soils.*

40. Page 6-5, EU ZI-06: Please see Specific Comments #34 and #35. The EBS only addresses a portion of this EU. The acreage that is applicable should be identified. A figure should be included to distinguish the boundaries specified in the ROD and the implemented DVS methodology that is subject to this EBS, with sample locations. This will assist in identifying for that portion of the EU not being considered in the transfer footprint. The EPA cannot support this area-weighting method used for the DOE evaluation or the conclusions made for this EU regarding a risk to human health, especially when the average remediation level for the radionuclide Cs-137 was exceeded in this EU.

***DOE RESPONSE:*** *See response to Comment #35. The new fold-out map has been added to the EBS Report, which shows all of the EU boundaries, the property transfer boundary, and the DVS sample locations within the transfer footprint. As discussed in response to Comment #35, the EBS Report has been revised to present the risk evaluation for the entire EU for the partial EUs included in the transfer footprint. EU ZI-05 has received EPA and TDEC approval for NFA for soils.*

41. Page 6-5, EU ZI-07: Please see Specific Comments #34 and #35. The EBS only addresses a portion of this EU. The acreage that is applicable should be identified. A figure should be included to distinguish the boundaries specified in the ROD and the implemented DVS methodology that is subject to this EBS, with sample locations. This will assist in identifying for that portion of the EU not being considered in the transfer footprint. The EPA cannot support this area-weighting method used for the DOE evaluation or the conclusions made for this EU regarding a risk to human health, especially when the average remediation level for the radionuclide Np-237 was exceeded in this EU.

***DOE RESPONSE:*** *See response to Comment #35. A new fold-out map has been added to the EBS Report, which shows all of the EU boundaries, the property transfer boundary, and the DVS sample locations within the transfer footprint. As discussed in response to Comment #35, the EBS Report has been revised to present the risk evaluation for the entire EU for the partial EUs included in the transfer footprint. EU ZI-05 has received EPA and TDEC approval for NFA for soils.*

42. Page 6-6, EU ZI-08A: Please see Specific Comments #34 and #35. The EBS only addresses a portion of this EU. The acreage that is applicable should be identified. A figure should be included to distinguish the boundaries specified in the ROD and the implemented DVS methodology that is associated with this EBS, with sample locations. This will assist in identifying for that portion of the EU not being considered in the transfer footprint. The EPA cannot support this area-weighting method used for the DOE evaluation or the conclusions made for

this EU regarding a risk to human health. Although the average detected concentration is less than  $1 \times 10^{-5}$  industrial PRG for benzo(a)pyrene across the EU, the data calculations are not presented to confirm there are no risks within the transfer footprint of the exposure unit. Please provide the data to demonstrate the conclusion made in the text.

**DOE RESPONSE:** See response to Comment #35 and General Comment #3. A new fold-out map has been added to the EBS Report, which shows all of the EU boundaries, the property transfer boundary, and the DVS sample locations within the transfer footprint. As discussed in response to Comment #35, the EBS Report has been revised to present the risk evaluation for the entire EU for the partial EUs included in the transfer footprint. EU Z1-08A has received EPA and TDEC approval for NFA for soils, and the data and risk evaluation is presented in the approved PCCR.

43. Page 6-6, EU Z1-08B: Please see Specific Comments #34 and #37.

**DOE RESPONSE:** See responses to Comments #34 and #37.

44. Page 6-8, EU Z1-09: Please see Comment #43. The text states that with the exception of one, all DVS samples were collected within the transfer footprint. Please confirm whether the entire EU is within the transfer footprint of this EBS. Additionally, text should be added that discusses that groundwater is to be evaluated as referenced for the K-1085 Old Firehouse Burn Area following the soils remedial action in this EU. See Specific Comment #13.

**DOE RESPONSE:** As shown on Figure 3.1 and the new fold-out map (Plate 1), the entire EU is not included in the transfer footprint. Table 3-1 has been revised to indicate that the need for additional remediation at the K-1085 Burn Area Burial Site is deferred to the Zone 1 Final ROD. Text also has been added to indicate that groundwater will be evaluated under the ETPP Sitewide ROD. The data collected and the evaluation of those data, to ensure that the RAOs under the approved Zone 1 Interim ROD are satisfied, are presented in detail in the PCCRs, which are submitted to EPA and TDEC for review and approval. These data are also available in OREIS. The EBS Report references these PCCRs as the foundational basis to support the transfer of the property for industrial use. All of the EUs included in the proposed transfer footprint addressed by the EBS Report have met the Zone 1 ROD RAOs for soils, and all of these EUs have received EPA and TDEC approval for No Further Action (NFA), except for the EUs covering a portion of the Former K-770 Scrap Yard Area, which are awaiting a final decision on the remedial action to address asbestos remaining in soils. Sections 6 and 7 of the EBS Report are intended to provide a summary of the data and human health risk evaluation presented in detail in the PCCRs; re-evaluation of these data in the EBS Report is unnecessary and would undermine the purpose of the PCCRs. A large fold-out map of the EUs in the transfer footprint and all of the DVS sample locations within these EUs has been

*added to the EBS Report. The data evaluation for the EUs included in the transfer footprint, including the maximum concentrations and a screening against background concentrations, is presented in detail in the PCCRs.*

45. Page 6-8, EU Z1-10: See Comment #34.

***DOE RESPONSE:*** *See response to Comment #34.*

46. Page 6-10, EU Z1-11: See Comment #34.

***DOE RESPONSE:*** *See response to Comment #34.*

47. Page 6-10, EU Z1-12: See Comment #34.

***DOE RESPONSE:*** *See response to Comment #34.*

48. Page 6-11, EU Z1-13: See Comment #34.

***DOE RESPONSE:*** *See response to Comment #34.*

49. Page 6-11, EU Z1-14: See Comment #34.

***DOE RESPONSE:*** *See response to Comment #34.*

50. Page 6-11, EU Z1-15: See Comment #34.

***DOE RESPONSE:*** *See response to Comment #34.*

51. Page 6-12, EU Z1-16: See Comment #34.

***DOE RESPONSE:*** *See response to Comment #34.*

52. Page 6-12, EU Z1-17: See Comment #34

***DOE RESPONSE:*** *See response to Comment #34*

53. Page 6-13, EU Z1-18: See Comment #34.

***DOE RESPONSE:*** *See response to Comment #34.*

54. Page 6-12, EU Z1-19: See Comment #34.

***DOE RESPONSE:*** *See response to Comment #34.*

55. Page 6-12, EU Z1-20: See Comment #34. Please ensure the concrete pad and contaminants detected are subject to the recently negotiated agreement regarding slab/pad evaluations.

**DOE RESPONSE:** *See responses to Comments #34 and #33.*

56. Page 6-13, EU Z1-21: See Comment #34.

**DOE RESPONSE:** *See response to Comment #34.*

57. Page 6-14, EU Z1-22: See Comment #34

**DOE RESPONSE:** *See response to Comment #34.*

58. Page 6-15, EU Z1-24: See Comment #34.

**DOE RESPONSE:** *See response to Comment #34.*

59. Page 6-15, EU Z1-25: See Comment #34.

**DOE RESPONSE:** *See response to Comment #34.*

60. Page 6-15, EU Z1-26: See Comment #34. Please ensure the concrete pad and contaminants detected are subject to the recently negotiated agreement regarding slab/pad evaluations.

**DOE RESPONSE:** *See responses to Comments #34 and #33.*

61. Page 6-16, EU Z1-27: See Comment #34. This EU is contained in a PCCR that was not approved. Please modify the reference to its approval and insert text appropriate to the status of the EU evaluation.

**DOE RESPONSE:** *See response to Comment #34. The reference to “approved” has been revised, and text added to explain the status of the EU with respect to the Zone 1 ROD requirements for industrial use.*

62. Page 6-16, EU Z1-28: See Comment #34. This EU is contained in a PCCR that was not approved. Please modify the reference to its approval and insert text appropriate to the status of the EU evaluation.

**DOE RESPONSE:** *See response to Comment #34. The reference to “approved” has been revised, and text added to explain the status of the EU with respect to the Zone 1 ROD requirements for industrial use.*

63. Page 6-16, EU Z1-29: See Comment #34. This EU is contained in a PCCR that was not approved. Describe the remedial action taken since reference is made to

post-remediation DVS confirmatory samples. Please modify the reference to its approval and insert text appropriate to the status of the EU evaluation.

**DOE RESPONSE:** *See response to Comment #34. The reference to “approved” has been revised, and text added to explain the status of the EU with respect to the Zone 1 ROD requirements for industrial use. A summary of the remedial action performed has also been added to the text.*

64. Page 6-17, EU Z1-30: See Comment #34. This EU is contained in a PCCR that was not approved. Describe the remedial action taken since reference is made to post-remediation DVS confirmatory samples. Please modify the reference to its approval and insert text appropriate to the status of the EU evaluation.

**DOE RESPONSE:** *See response to Comment #34. The reference to “approved” has been revised, and text added to explain the status of the EU with respect to the Zone 1 ROD requirements for industrial use. A summary of the remedial action performed has also been added to the text.*

65. Page 6-17, EU Z1-31: See Comment #34. This EU is contained in a PCCR that was not approved. Describe the remedial action taken since reference is made to post-remediation DVS confirmatory samples. Please modify the reference to its approval and insert text appropriate to the status of the EU evaluation.

**DOE RESPONSE:** *See response to Comment #34. The reference to “approved” has been revised, and text added to explain the status of the EU with respect to the Zone 1 ROD requirements for industrial use. A summary of the remedial action performed has also been added to the text.*

66. Page 6-17, EU Z1-32: See Comment #34. This EU is contained in a PCCR that was not approved. Describe the remedial action taken since reference is made to post-remediation DVS confirmatory samples. Please modify the reference to its approval and insert text appropriate to the status of the EU evaluation.

**DOE RESPONSE:** *See response to Comment #34. The reference to “approved” has been revised, and text added to explain the status of the EU with respect to the Zone 1 ROD requirements for industrial use.*

67. Page 6-17, EU 2-33: See Comment #34. This EU is contained in a PCCR that was not approved. Describe the remedial action taken since reference is made to post-remediation DVS confirmatory samples. Please modify the reference to its approval and insert text appropriate to the status of the EU evaluation.

**DOE RESPONSE:** *See response to Comment #34. The reference to “approved” has been revised, and text added to explain the status of the EU with respect to the Zone 1 ROD requirements for industrial use. A summary of the remedial action performed has also been added to the text.*

68. Page 6-18, EU 21-34: See Comment #34.

***DOE RESPONSE:*** See response to Comment #34.

69. Page 6-18, EU 21-35: See Comment #34.

***DOE RESPONSE:*** See response to Comment #34.

70. Page 6-18, EU 21-36: See Comment #34.

***DOE RESPONSE:*** See response to Comment #34.

71. Page 6-19, EU 21-37: See Comment #34.

***DOE RESPONSE:*** See response to Comment #34.

72. Page 6-19, EU 21-38: See Comment #34. Describe the remedial action taken in this EU.

***DOE RESPONSE:*** See response to Comment #34. A summary of the remedial action performed has been added to the text.

73. Page 6-19, EU 21-38: See Comment #34. Describe the remedial action taken in this EU.

***DOE RESPONSE:*** See response to Comment #34. A summary of the remedial action performed has been added to the text.

74. Page 6-19, EU 21-39: See Comment #34.

***DOE RESPONSE:*** See response to Comment #34.

75. Page 6-20, EU 21-40: See Comment #34.

***DOE RESPONSE:*** See response to Comment #34.

76. Page 6-20, EU 21-41: See Comment #34.

***DOE RESPONSE:*** See response to Comment #34.

77. Page 6-20, EU 21-42: See Comment #34.

***DOE RESPONSE:*** See response to Comment #34.

78. Page 6-21, EU 21-43: See Comment #34. Please confirm whether an actual risk assessment versus a risk screening was performed for this EU.

**DOE RESPONSE:** See response to Comment #34. The text has been revised to indicate that a risk screening was performed rather than a full risk assessment.

79. Page 6-21, EU 21-44: See Comment #34.

**DOE RESPONSE:** See response to Comment #34.

80. Page 6-21, EU 21-45: See Comment #34.

**DOE RESPONSE:** See response to Comment #34.

81. Page 6-21, EU 21-45: See Comment #34 regarding the transfer footprint.

**DOE RESPONSE:** See response to Comment #34.

82. Page 6-21, EU 21-46: See Comment #34 regarding the transfer footprint.

**DOE RESPONSE:** See response to Comment #34.

83. Page 6-23, EU 21-47: See Comment #34 regarding the transfer footprint.

**DOE RESPONSE:** See response to Comment #34.

84. Page 7-1 Risk Evaluation, Paragraph 3: Please provide a justification for referencing the Zone 2 ROD when a comparable statement is included in the Zone 1 ROD. It is more appropriate to reference the Zone 1 Remedial Action Objectives and not Zone 2.

**DOE RESPONSE:** Reference to the Zone 2 ROD was a typographical error and this has been corrected.

85. Page 7-1, Risk Evaluation, Paragraph 3: The bulleted items should include a reference to the Groundwater RAO that is included in the Zone 1 ROD, where soils pose an impact to this medium.

**DOE RESPONSE:** A bullet addressing the groundwater RAO included in the Zone 1 ROD has been added to this section.

86. Page 7-3, Table 7.1: Please ensure consistency in the EU references where no FFA sites have been identified. Rename those EUs with Z2 references and ensure the identified EUs and associated text actually references Z1 EUs. Please include a reference to the pending soil remedial actions for the Zone 1 Final Soils ROD since this EBS addresses the status of soils and the potential impact for human health and ecological risks.

**DOE RESPONSE:** *The EU listing in Table 7.1 has been corrected to indicate these are Zone 1 EUs. A footnote has been added to Table 7.1 addressing the pending remedial actions for the affected EUs.*

87. Page 7-5: This is a duplication of the information contained in the last paragraph of Page 7-4.

**DOE RESPONSE:** *Paragraph has been deleted.*

88. Section 8, References: On page 8-2, please identify the DOE 2012b. *Addendum II to the Phased Construction Completion Report for the K-1007 Ponds Area and Powerhouse North Area in Zone 1* (DOE/OR/01-2294&D2/A2) as "draft." This document was not approved as it identified a land use change that did not conform to the CERCLA process.

**DOE RESPONSE:** *The reference to Addendum II has been revised to include "Draft" in the title.*

**Comments on the Covenant Deferral Request for the  
Proposed Title Transfer of the Former Powerhouse, Duct Island, and  
K-1007-P1 Pond Area at the East Tennessee Technology Park,  
Oak Ridge, Tennessee (DOE/OR/01-2687)  
(Draft) September 2015**

1. Page 1, Introduction: The CDR does not identify an intended transferee. Please include the identity of the transferee.

***DOE RESPONSE:** CROET is currently leasing approximately 400 acres of this property and has requested the transfer of portions of the 662 acres included in this document. It is anticipated that CROET would be the recipient if the balance is transferred, but other parties could also request the property.*

2. Page 1: In the third paragraph, the CDR notes that no buildings are included in the proposed transfer. Text on page 10 states that the underlying land (beneath Building 1313-F) will not be transferred until building demolition, confirmatory soil sampling, and soil remedial action, if any, are completed. Please expand the text on page 1 to clarify the buildings for which the underlying land will not be transferred until after remedial action, if any, is completed.

***DOE RESPONSE:** The text of this section has been revised as the K-708-E Scale House has been added to the transfer. The text regarding what is included in the property transfer has been revised to include a discussion of Bldg. K-708-E. Additional discussion of the status of Building K-1313-F also has been added to this section. The final disposition of this building has not been decided and neither the building, nor the land beneath the building, will be transferred until an evaluation indicates that they are suitable for transfer.*

3. Page 1: In the fourth paragraph, the first and second sentences seem to be inconsistent. The first states that a No Further Action decision has been made and approved. The next sentence, however, describes further actions that will be taken and others that might be taken. Please expand the text.

***DOE RESPONSE:** These sentences have been revised to clarify that the NFA is for soils and final disposition of K-1313-F has not been determined. Additional characterization of the building will be necessary if it is not demolished, and an evaluation of the soils beneath the slab will be performed if the building is demolished.*

4. Page 4, Paragraph 1: Please change the word “would” to “will” in line 9.

***DOE RESPONSE:** Revised as requested.*

5. Page 4, Ecological Impacts: The language regarding ecological receptors on Page 5 should mention that the final ETTP Sitewide ROD will address ecological risks from constituents in sediments as well as surface water and groundwater. The surface water and sediments of the Beaver Dam Ponds were deferred to the final ETTP Sitewide ROD, Section 1.0, page 6 and Figure 3: Some of the dashed line that shows the boundary(ies) of the transfer footprint appears to be obscured by a solid blue line. Please address.

**DOE RESPONSE:** *The language regarding ecological receptors has been revised to indicate that ecological risk from sediments will be addressed in the ETTP Sitewide Final ROD. Figure 3 has been revised as best that can be done to account for overlapping boundaries.*

6. Page 5, Ecological Impacts: The language regarding ecological receptors should mention that the final ETIP Sitewide ROD will address ecological risks from constituents in sediments as well as surface water and groundwater. The surface water and sediments of the Beaver Dam Ponds were deferred to the final ETTP Sitewide ROD.

**DOE RESPONSE:** *The language regarding ecological receptors has been revised to indicate that sediments will also be addressed in the ETTP Sitewide Final ROD.*

7. Page 10. See Comment #2 above and reconcile the text.

**DOE RESPONSE:** *See response to Comment #2.*

8. The CDR and EBS refer to the Zone 1 ROD; however, they should specify to which Zone 1 ROD they are referring. The Zone 1 Final ROD is mentioned on Page 41, but no details on its scope were provided. The CDR described the suitability for transfer under CERCLA relative to actions completed under the Zone 1 Interim ROD, which covered human health protection. The CDR should include a discussion of the actions likely to be taken under the Zone 1 Final ROD. The difference in scope between the Zone 1 Interim ROD and the Zone 1 Final ROD should be explained.

**DOE RESPONSE:** *Additional clarification has been added to identify the Zone 1 Interim ROD versus the Zone 1 Final ROD in the CDR. A table summarizing the Zone 1 Final ROD actions has been added to this section*

9. K-1313-F is still operating and is not subject to CERCLA. The text in the CDR and EBS should state the facility is not subject to CERCLA at this time. Please identify the EU that contains K-1313-F.

**DOE RESPONSE:** *The location of K-1313-F in EU Z1-21 has been added to the text, and clarification added that the building is still in operation and not currently subject to CERCLA has also been added.*

10. Page 5, Ecological Impacts, Paragraph 2: The text should reference the remediation of potential risks to ecological receptors will occur during the implementation of the ETIP Final Zone 1 remedial actions. Also, the reference to the ETTP Sitewide ROD as addressing ecological risk should be corrected. The final Zone 1 ROD will address ecological risks contained in the scope of this CDR.

**DOE RESPONSE:** *A summary of the Zone 1 Final ROD ecological soil actions has been added to this section and the reference to the Sitewide ROD has been revised.*

11. The CDR should describe the process in place to protect the environment under the Zone 1 Final ROD. Any land-use restrictions necessary to ensure protection of ecological resources should be identified in the CDR. Parcels that were evaluated for ecological risk in the Zone 1 Final RI/FS, based on open space land use for ecological receptors, should be identified.

**DOE RESPONSE:** *A table of the Zone 1 Final ROD actions and LUCs to be implemented for the protection of the environment has been added to this section.*

12. Page 6, Paragraph 1: Did the EA (DOE/EA-1640) include all of ETTP? Was the document reviewed by the EPA and/or TDEC? If so, please include the date of review and/or approval.

**DOE RESPONSE:** *The EA (DOE/EA-1640) did address all of the ETTP. The EA was reviewed by TDEC. Review and approval of DOE EAs by EPA and TDEC is not required.*

13. Page 6, Paragraph 2: Please see Comment #4 above regarding ecological risks referenced for action within Zone 1.

**DOE RESPONSE:** *DOE assumes this is referring to Comment #5 above. See response to Comment #5.*

14. Page 8, Paragraph 1: Please provide information on the EPA/TDEC CERCLA evaluation of the K-1251 Barge Facility. This comment is also applicable to the EBS.

**DOE RESPONSE:** *A CERCLA evaluation has not been performed for the facility, as the area lies outside of the Zone 1 boundary. The environmental documentation for lease of the property was prepared and submitted to EPA for review. Additional discussion of the sampling results for the K-1251 Barge Facility has been added to the CDR and EBS Report.*

15. Page 8, Paragraph 2: Please include the approximate acreage subject to the CDR. The total should separately identify acreage already transferred of the EUs subject to the CDR.

**DOE RESPONSE:** *The CDR addresses a total of 662 acres as stated on page 1 and page 6. The previously transferred property is not part of this transfer.*

16. The CDR lists the property to be included on Page 8, which describes lands around the K-1007- PI Pond. However, it was not clear whether the pond itself is part of the proposed transfer. Please clarify.

**DOE RESPONSE:** *The transfer does not include the K-1007-PI Pond and a statement has been added to specify that the pond is not included.*

17. Page 10. See Comment #2 above and reconcile the text.

**DOE RESPONSE:** *See response to Comment #2.*

18. Page 10, Paragraph 2: In the next to the last sentence, please change the word “would” to “will.”

**DOE RESPONSE:** *Text has been revised as requested.*

19. Page 10, Paragraph 4: Please confirm that a risk assessment was conducted in EU Z1-26 and not a risk screening.

**DOE RESPONSE:** *Text has been revised to indicate a risk screen was performed for this EU, rather than a complete risk assessment.*

20. Page 12, Section 2.0, Nature and Extent of Contamination: In paragraph 2, the DOE EM evaluation process that is stated to be similar to the DVS program may/may not be appropriate for partial EU risk assessment. Additionally, the DOE has not presented the data to be evaluated by the EPA or TDEC in support of the DOE determination.

**DOE RESPONSE:** *See response to Comment #35. The text has been revised to indicate that the entire EU, consistent with the PCCR, has been used for the purpose of risk evaluation over the EU. The objective of the EBS Report is to provide this information for the proposed transfer property. The data collected and the evaluation of those data, to ensure that the Zone 1 RAOs are satisfied, are presented in detail in the PCCRs, which are submitted to EPA and TDEC for review and approval. The EBS Report relies on these PCCRs for the foundational basis to support the transfer of the property for industrial use. The PCCRs, referenced extensively in the EBS Report, which address the EUs included in the transfer footprint, have either received EPA and TDEC approval for NFA, or have met the Zone 1 ROD RAOs for NFA, for soils for industrial use*

of the property. The EUs that have met the RAOs, but have not been formally approved by EPA or TDEC, are awaiting a final decision on the remedial action to address asbestos remaining in soils in a portion of the Former K-770 Scrap Yard Area. Otherwise, the soils in these EUs meet the Zone 1 requirements for industrial use as demonstrated in the referenced PCCRs. The EBS Report and CDR are intended to only provide a summary of the data and human health risk evaluation presented in detail in the PCCRs, and a re-evaluation of these data is unnecessary.

21. Page 12, Section 2.0, Nature and Extent of Contamination: In paragraph 4 the CDR should include text describing the presence of subsurface infrastructure such as water lines, drain lines, and storm drains, etc., particularly if these items have not been previously evaluated and included approved PCCRs.

**DOE RESPONSE:** *All of the water lines, drain lines, etc., within the top 10 feet of soil were evaluated under the DVS protocol for all of Zone 1. The fold-out map shows the location of infrastructure within the transfer footprint.*

22. Page 13, bullet #4: Please identify the document, *Addendum to the Phased Construction Completion Report for the K-1007 Ponds Area and Powerhouse North Area in Zone 1*, as being approved. The EPA approved the document in December 2011.

**DOE RESPONSE:** *The CDR has been revised to indicate this PCCR is approved.*

23. Page 14, Paragraph 2, Section 2.1: A groundwater plume is referenced as being at various locations with the proposed transfer footprint. However, the CDR does not present a graphic or figure to depict the location of the plume(s). Please add the plume(s) graphic(s) to the CDR and the EBS.

**DOE RESPONSE:** *The plumes are shown on Figure 6 of the CDR and Figure 4.16 of the EBS Report. A reference to the figure has been added to this section of the CDR.*

24. Page 15, Section 2.1: The bullet describing the presence of contamination from volatile organic compound, metals, and radioactivity in the groundwater represents a release of hazardous substances within the proposed transfer footprint. Although the groundwater decision will be made in the ETTP Final Sitewide ROD, the potential impact of these contaminants to the soils should be more descriptive. Please add additional text describing the potential impact to the soils. This information should also be contained in the EBS to support the baseline risk of potential exposure, especially since earlier land transfers were not exposed to as much contamination that resulted in groundwater plumes.

**DOE RESPONSE:** *The top 10 feet of soil was previously evaluated in the PCCRs for the transfer footprint and given an NFA determination in the areas where groundwater contamination is present (EUs Z1-06, -08, and -09). The groundwater plumes are decreasing in concentration with time and would not be expected to increase soil concentrations above what was previously assessed and found to be below Zone 1 RAOs.*

25. Page 17, Section 2.2.1: Please update the text which references the EPA guidance on vapor intrusion to reflect: *OSWER Technical Guide for Assessing and Mitigating the Vapor Intrusion Pathway from Subsurface Vapor Sources to Indoor Air* [OSWER Publication 9200.2-154]. The document, which is dated June 2015, is also available on-line at: <http://www.epa.gov/oswer/vaporintrusion/>.

**DOE RESPONSE:** *Reference to the 2015 OSWER Guidance has been added to the text.*

26. Please confirm whether the alternative process of vapor intrusion evaluation remains applicable now that the EPA has issued the final guidance for assessing and mitigating vapor intrusion pathways from subsurface sources to indoor air.

**DOE RESPONSE:** *The process for evaluating vapor intrusion at ETPP remains applicable as it is based on the Johnson & Ettinger (1991) model, which is also used as the basis for evaluating vapor intrusion in the final guidance.*

27. Table 4.1, Page 20: Please explain the differences in the columns for information presented on page 20 versus that on page 21. There is no column heading of “Final status decision” on pages 20 and 21. Please include text that presents the relevant differences. The EPA suggests preparing two tables such that the information on pages 20 and 21 will be transparent to the reader.

**DOE RESPONSE:** *This is one table that covers three pages. An issue with the formatting of the first page of the table resulted in the loss of the right-most column. The table has been revised to include the “Final status decision” column on all pages.*

28. Page 23, Section 4.1: This section should provide additional information on the contaminants and the potential impact on vapor intrusion. Referencing other locations across does not minimize the need to present information based on the presence of groundwater plumes in the areas of the proposed property transfer.

**DOE RESPONSE:** *Additional discussion of the groundwater concentrations beneath the transfer footprint and compared to other areas of ETPP has been added to this section. DOE has evaluated vapor intrusion in other areas of the ETPP that have higher concentrations of VOCs in groundwater and a complete pathway for vapor intrusion has not been identified.*

29. Table 5.1, Page 24: The K-720 Fly Ash Pile has a soil cover. This soil cover may be required to be maintained in the Final Zone 1 ROD. Please revise the “Decision” column to indicate the maintenance requirement in order not to increase the impact on groundwater due to infiltration.

**DOE RESPONSE:** *The table has been revised to indicate that DOE retains responsibility for maintaining the soil cover over the Fly Ash Pile.*

30. Table 5.1, Page 25: The Building K-725-A slab should be added as an entry in the table until evaluated and removed from the list of residual slabs/pads according to the recent FFA agreement.

**DOE RESPONSE:** *There are no Zone 1 slabs, including the K-725-A slab, which are included in the recent FFA agreement concerning slabs (Appendix K of the DOE 2015 Annual Remediation Effectiveness Report). The K-725-A slab will be surveyed for residual radioactive contamination and, if necessary, decontaminated to free-release levels under DOE Order 458.1 prior to request for EPA and TDEC approval of the CDR.*

31. Page 27, Section 6.1: Please remove references to Zone 2 as this CDR addresses property contained in Zone 1.

**DOE RESPONSE:** *The reference to the Zone 2 ROD has been revised to the Zone 1 ROD.*

32. Pages 27 and 40: In paragraph D, please clarify whether the restriction against residential use should include use as a hospital.

**DOE RESPONSE:** *Use of the transferred land as a hospital was included and evaluated in the 2011 Sitewide EA.*

33. Page 28: Should the name of the transferee be identified in the Quitclaim Deed?

**DOE RESPONSE:** *CROET has requested portions of the Property; the remainder of the property has not yet been requested, and hence the transferee is not yet known, and therefore is not named in the draft deed. The quitclaim deed covenants will be applicable to any transferee and their successors.*

34. Page 31, Exhibit A: Please include a metes and bounds description to accompany the survey plat (with metes and bound points noted) in order for EPA to verify that the legal description of the property matches the plat.

**DOE RESPONSE:** *The metes and bounds description has been included in the draft deed and will be provided to EPA.*

35. Page 39, Exhibit D: In paragraph 2 the reference to the contaminated plume does not appear to be consistently stated in other sections of the CDR and information contained in the EBS. The document needs to recognize the potential of groundwater being a secondary source of soil contamination.

*DOE RESPONSE: Text in the CDR and EBS Report has been revised to be consistent between the various sections where groundwater plumes are discussed. Although there are no indications that groundwater may be a secondary source to soils in the transfer footprint, text has been added to indicate that groundwater may be a secondary source to soils.*

36. Page 41: Please confirm the projected dates for the Zone 1 Final Record of Decision and the Completion of Remedial Action. The information should be consistent with Appendix E of the FFA.

*DOE RESPONSE: The dates have been revised to coincide with the current Appendix E of the FFA.*

37. Please provide the deed prior to the time of DOE's request for EPA concurrence in order to ensure inclusion of the necessary items in the deed. Once the deed has been recorded, please provide it to EPA in order to verify that any conditions necessary for EPA concurrence was included in the deed.

*DOE RESPONSE: DOE will provide the draft deed prior to the request for EPA approval. Recorded deeds are available upon request.*

**Supplemental EPA Comments to the EPA December 22, 2015, Comments  
Covenant Deferral Request, Former Powerhouse, Duct Island, and K-1007-P1  
Pond Area, East Tennessee Technology Park  
(DOE/OR/01-2687; September 2015)**

1. Section 2.2.1 - Revise this section by replacing the third and fourth sentences, beginning with "This process calls for..." with the following sentences:

"In 2006, EPA Region 4 provided additional guidance to DOE-ORO on evaluation of the vapor intrusion pathway ["Proposed Modifications to the Evaluation of the Vapor Intrusion Pathway in Support of Property Transfers at the East Tennessee Technology Park (ETTP), January 6, 2006, Oak Ridge, Tennessee," EPA 2006]. No sampling was necessary because DOE ORO has agreed that the Quitclaim Deed for the property will include a requirement that all future buildings constructed on the property that will be occupied will incorporate engineered barriers to protect against vapor intrusion. The Quitclaim Deed condition addressing this is found in Section 6.2, Condition (11)."

**DOE RESPONSE:** Based on available groundwater data from the Property, the text in Section 2.2.1 of the CDR provides appropriate mitigation to address the potential risk from vapor intrusion. The language in this section states: “This process calls for development of vapor intrusion investigation and control requirements on a case-by-case basis, dependent upon conditions present at properties being transferred. The Quitclaim Deed condition addressing this for the former Powerhouse Area, Duct Island, and K-1007-P1 Pond Area is found in Section 6.2, Condition (11).” The evaluation of potential vapor intrusion on a case-by-case basis is appropriate for the Former Powerhouse, Duct Island, and K-1007-P1 Pond Area, where VOC groundwater contamination is absent from the vast majority of the ~662 acres.

While two groundwater plumes have been identified on the periphery of the Property (the K-1085 Firehouse Burn Area on the southern boundary and the K-27 Area on the northeastern boundary), the source of the contamination and the highest concentrations are located outside of the Property. The plumes exhibit generally short flow paths and discharge primarily to nearby surface water. Bedrock VOC concentrations in these plumes are significantly lower than the shallow concentrations in the residuum, and overall, the VOC concentrations exhibit decreasing concentration trends. These two areas have limited development potential due to the presence of wetlands.

EPA’s VISL calculator (visl-calculator\_v\_346.xlsm), in accordance with the OSWER Technical Guide for Assessing and Mitigating the Vapor Intrusion Pathway from Subsurface Vapor Sources to Indoor Air (EPA 2015), and the most recent available groundwater data (March 2015) for the K-1085 Firehouse Burn Area, were used to calculate risks and hazards from indoor air for a commercial building. The maximum groundwater concentrations for the VOCs, trichloroethene (TCE), tetrachloroethene (PCE), and vinyl chloride (VC), which represents all of the VOCs detected above 1 µg/L, were input into the calculator. The results of the VISL calculation indicate that the maximum risk would be 7.7E-06 from TCE and the maximum hazard quotient (HQ) would be 2.6 for TCE, which does exceed the target HQ of 1, but not by a significant amount.

Using groundwater data from the K-27 plume monitoring wells nearest to the Property and using VISL for a commercial building, the maximum risks from indoor air would be 9.4E-07 from TCE. The maximum HQ would be 0.32, also from TCE.

Finally, based on soil gas samples taken under buildings and from vacant parcels across ETPP, a complete vapor intrusion pathway has never been identified, even for buildings located over groundwater plumes with much higher concentrations of VOCs than present in the two plumes located on the periphery of the Property.

*Based on all the available information, requiring engineered vapor barriers for all types and sizes of buildings across all 662 acres is not warranted and would unnecessarily limit redevelopment potential for the property. Furthermore, such a requirement would appear to be more prescriptive than the most recent EPA guidance document (EPA 2015).*

2. Section 4.1 - Revise the first paragraph of this section to add the following to the end of the paragraph:

“However there is considerable uncertainty concerning VOC groundwater contamination beneath this property and the potential for a complete vapor intrusion pathway from nearby known VOC sources. The combination of several factors, including adjacent VOC plumes migrating in the direction of the property, VOC detections in the limited groundwater data set obtained from the property, and the karst conditions in the bedrock underlying most of the Heritage Center, represent the potential for a complete vapor intrusion pathway from these two VOC source areas that has not been sufficiently characterized. The EPA Region 4 has provided guidance to DOE-ORO on evaluation of the vapor intrusion pathway [“Proposed Modifications to the Evaluation of the Vapor Intrusion Pathway in Support of Property Transfers at the East Tennessee Technology Park (ETTP), January 6, 2006, Oak Ridge, Tennessee,” EPA 2006]. Consistent with this guidance, DOE-ORO determined no sampling was necessary in this area because DOE has agreed that the Quitclaim Deed for the property will include a requirement that all future buildings constructed on the property that will be occupied will incorporate engineered barriers to protect against vapor intrusion. No buildings are included in the proposed transfer.”

***DOE RESPONSE:*** *The uncertainty in bedrock flow paths at ETTP is acknowledged in Section 2.2 of the CDR. The extent of the K-1085 Firehouse Burn Area plume beneath the Property is one of the better defined plumes at ETTP. The K-1085 plume is situated within the shales and siltstones of the Rome Formation and is separated from the more karstic carbonate rocks of the Chickamauga Group by the Whiteoak Mountain thrust fault. Although the K-27 Area plume is located within the carbonate rocks of the Chickamauga, the primary flow direction toward Poplar Creek, and not toward the Property, is relatively well-defined based on potentiometric maps. It has been determined that the K-708-E Scale House, located at the entrance to the Powerhouse Area, will be included in the proposed transfer, so one building is included in the transfer.*

*Vapor intrusion has been evaluated at 13 existing ETTP buildings and 2 ETTP land parcels using the EPA-approved screening method for ETTP, developed using the Johnson and Ettinger model, and a complete pathway for soil vapor intrusion does not exist at any of these properties. Soil gas data for ED-5 West, located on the northeastern boundary of the Former Powerhouse Area and partially over the K-27 groundwater plume, indicates that TCE, which is the predominant VOC present in the K-27 Area plume, was not detected in either the*

wet season or dry season soil gas samples from this land parcel, despite concentrations of TCE in the K-27 Area plume exceeding 800 µg/L. An evaluation using EPA's VISL calculator and existing groundwater data in the vicinity of the Property indicates that risks from indoor air concentrations would be within the acceptable risk range, and significant hazards to human health are not present (see response to Comment #1).

Based on available groundwater data from the Property, the evaluation of potential vapor intrusion on a case-by-case basis is appropriate for the Former Powerhouse, Duct Island, and K-1007-P1 Pond Area, where VOC groundwater contamination is absent from the vast majority of the ~662 acres. Appropriate sections of the CDR and Deed restriction 11 have been revised to include the most recent EPA guidance on vapor intrusion (EPA 2015).

3. Section 6.2 - replace (11) with the following language:

“The GRANTEE covenants and agrees that any buildings intended to be occupied by workers eight hours or more per scheduled work day or by public visitors will be designed and constructed to minimize exposure to volatile organic contaminant vapors using EPA625/R-92-016 (June 1994), *Radon Prevention in the Design and Construction of Schools and Other Large Buildings*, as guidance. The GRANTEE may seek a waiver of this covenant from the GRANTOR, the United States Environmental Protection Agency, and the Tennessee Department of Environment and Conservation based upon alternative commitments or new information. If such waiver is granted, the provisions of this covenant shall no longer apply. The scope of such waiver shall extend only to the building in question unless expressly stated otherwise in the waiver.”

**DOE RESPONSE:** DOE recommends that the deed restriction reference the most recent EPA guidance for vapor intrusion (EPA 2015) rather than the 1994 guidance for radon prevention. Because of the relative flexibility of the 2015 vapor intrusion guidance compared to the 1994 radon prevention guidance, and because of DOE's role, or any successor federal agencies with stewardship responsibilities for ETTP, in enforcing deed covenants, maintaining and updating environmental data, and conducting environmental studies (e.g., groundwater modeling results), DOE recommends the following language for deed covenant 11:

The GRANTEE covenants and agrees that any buildings intended to be occupied by workers eight hours or more per scheduled work day or by public visitors will be designed and constructed to minimize exposure to volatile organic contaminant vapors. The GRANTOR and the GRANTEE will determine the necessary building design features to minimize this potential exposure using OSWER 9200.2-154 (June 2015), *OSWER Technical Guide for Assessing and*

*Mitigating the Vapor Intrusion Pathway from Subsurface Vapor Sources to Indoor Air*, as guidance.

## TDEC Comments on the Draft CDR and EBS for the Former Powerhouse, Duct Island, and K-1007-P1 Pond Area

### General Comments

1. It appears that considerable property will be made available by DOE's release of this area. Has any consideration been given to the use of a portion of this property for the proposed airport at ETTP?

The current location chosen for this airport will likely do considerable damage to the Mitchell Branch headwaters. Those headwaters are critical to the eventual ecological recovery of Mitchell Branch. Since the 1980s Mitchell Branch has continually been monitored for water quality and biological resources. During the intervening period, considerable recovery has occurred in lower Mitchell Branch as remediation activities were completed at ETTP. The headwaters of Mitchell Branch (un-impacted) have contributed greatly as a source of biota to re-populate the lower reaches of the stream as water quality and ecological conditions improved. Without healthy headwaters, recovery of lower Mitchell Branch will likely never occur.

**DOE RESPONSE:** *The location of the proposed airport is based on studies conducted by the Metropolitan Knoxville Airport Authority (MKAA). The MKAA transfer request does not include any of the property addressed by the CDR for the Former Powerhouse, Duct Island, and K-1007-P1 Pond Area. This area is not a sufficient size or configuration to support the needs of the airport.*

*The proposed property transfer to develop a general aviation airport has been evaluated in an Environmental Assessment, pursuant to the National Environmental Policy Act, which was issued for public comment in August 2015 and included TDEC review.*

2. The State strongly recommends DOE take the necessary measures to remove some of the surface contamination signs that are currently posted in the proposed areas for unrestricted industrial use. The magenta signs warning of radioactive contamination appear counterproductive to the desires of DOE, EPA, and the State to demonstrate the property is safe for industrial use. With minimal effort, the State believes DOE can follow the necessary steps to remove these warning signs in the area.

**DOE RESPONSE:** *DOE agrees and is proceeding with plans to perform the necessary evaluation under DOE 458.1 to remove these signs. Additional evaluation of potentially contaminated slabs will be performed to include radiological surveys to ensure that all slabs within the transfer footprint meet free-release levels and are managed accordingly (including down-posting as appropriate) prior to submission of the Final CDR for EPA and TDEC approval.*

3. The schedule for making a decision on the disposition pathway for the K-1313-F should be identified.

**DOE RESPONSE:** *Due to the high degree of uncertainty in the disposition pathway for the materials stored in K-1313-F, a schedule cannot be developed at this time.*

4. Facilities and structures remaining in the transfer footprint have been identified in Section 5 of the EBS, but the CDR specifically says that “no buildings are included in the proposed transfer.” The documents should clearly identify what this means. Will the buildings belong to DOE following the transfer of the land?

**DOE RESPONSE:** *The text in this section has been revised as it has been determined that the K-708-E Scale House, located at the entrance to the Powerhouse Area, will be included in the proposed transfer. A description of this building has been added to the document. While there are also some non-permanent/mobile structures and relic infrastructure, K-708-E is the only permanent building included in the transfer footprint. Building K-1313-F is a permanent building but is not included in the transfer. See CDR page 15 for discussion on K-1313-F.*

5. The CDR and EBS should explain what the property transfer means for the current lessees within the transfer footprint.

**DOE RESPONSE:** *CROET is currently leasing the property from DOE and subleasing to the current tenants, and has the option after transfer to continue to lease or sell.*

6. The documents should explain what the property transfer means for the cemeteries that are located within the transfer footprint, specifically the Gallaher and Welker plots located in Z1 EU-13.

**DOE RESPONSE:** *The cemeteries are included in the transfer; however, various Tennessee laws are in place for protecting cemeteries (e.g., T.C.A. Titles 39, 46, and 68). Text has been added to indicate they are protected under Tennessee law.*

7. The EBS should discuss the bricks that are staged on the K-723 slab, which is located in EU Z1-26. Are the bricks being transferred?

**DOE RESPONSE:** *The land the bricks are located on is included in the transfer. Currently, DOE has no plans to remove the bricks.*

8. The EBS should discuss the two radiological areas remaining in EU Z1-30 (K-725-A and K-736 slabs). The radiological postings should be removed prior to transfer of the land. See General Comment #2.

**DOE RESPONSE:** *All of the slabs within the transfer footprint (and for all of Zone 1) were previously evaluated as part of the Zone 1 DVS. However, there is the potential for residual radioactive contamination to be present on slabs that is below Zone 1 RLs for soils, slabs, and subsurface structures but above free-release levels found in DOE Order 458.1. Additional evaluation of potentially contaminated slabs will be performed to include radiological surveys to ensure that all slabs within the transfer footprint meet free-release levels and are managed accordingly (including down-posting as appropriate) prior to submission of the Final CDR for EPA and TDEC approval.*

9. The land use restrictions for subsurface asbestos identified in the Final PP for Soils in Zone 1 should be included in the documents.

**DOE RESPONSE:** *A table of the applicable LUCs for the transfer property has been added to the CDR and EBS.*

10. The Rarity Ridge development area currently is sparsely populated. Future occupancy warrants the need for DOE to address the final and safe disposition of the hazardous material associated with the sodium shields. Actions taken may help to ensure that another sodium fire or some other incident does not occur.

**DOE RESPONSE:** *DOE is pursuing disposition options for the sodium shields stored in K-1313-F.*

11. The Footprint Reduction Program was developed to determine parcels of DOE property that were environmentally unaffected by federal activities. The purpose was to determine which parcels could be conditionally released from CERCLA requirements. The areas known as Former Powerhouse, Duct Island and the K-1007-P1 Pond Area were rejected from the Footprint Reduction survey project due to known DOE anthropogenic land impacts. The aforementioned areas should be distinguished from the Footprint Reduction project. The intent here is to release impacted areas for brownfield use.

**DOE RESPONSE:** *References to the Footprint Reduction Program on page 4-24 are addressing adjacent property and not the proposed transfer footprint.*

12. Several storm water drains exist on the Clinch River side of the Former Powerhouse Area. Have the drains been identified as potential contaminant pathway sources and are they still functional?

**DOE RESPONSE:** *The storm drains are still functional and are monitored under the ETP NPDES program. The outfalls are shown on a large fold-out map that has been added to the EBS, and text discussing the presence of the storm drains has been added to the CDR and EBS. DOE retains responsibility to address any contamination identified on the property.*

13. Currently a wood chipping plant and a rail car service are located in the Former Powerhouse Area. Are there additional contaminants of concern from these facilities that will need to be addressed prior to land transfer?

**DOE RESPONSE:** *The lessee will be responsible for ensuring their operations have not contributed any contamination to the area prior to termination of the lease.*

14. Please include in the EBS a listing of the NFIs and associated letters.

**DOE RESPONSE:** *There are no NFI determinations within the transfer footprint and hence none are listed in the EBS Report. The West Pine Ridge NFI addresses adjacent property on the south side of Highway 58, as shown on Figure 3.1 of the EBS Report.*

### **CDR-Specific Comments**

1. Page 1, Last sentence: The reference DOE 2011a is not included in a reference section for the document. There is no reference section in the document.

**DOE RESPONSE:** *The DOE 2011a reference is included in the reference section of the EBS, which is an attachment to the CDR. The CDR format was developed over a decade ago and for consistency has remained the same for all CDRs DOE has prepared.*

2. Page 1, Paragraph 4: “The building structure will either be demolished or be transferred later after confirmatory sampling of the facility has been completed and the building is found to meet the requirements of the Zone 1 Record of Decision (ROD).” Are there requirements for buildings in the Zone 1 ROD? Please clarify this statement.

**DOE RESPONSE:** *The confirmatory sampling is for the remaining slab and/or exposed land if the slab is removed. The building structure itself must meet applicable DOE requirements for release. Additional clarification on the building has been added.*

3. Page 2, Figure 1: Should a list of figures be included in this document?

**DOE RESPONSE:** *The document format for the CDR was developed over a decade ago and for consistency has remained the same for all CDRs DOE has prepared.*

4. Page 6, Paragraph 1, First sentence: DOE 2011b should be included in the references section for the document.

**DOE RESPONSE:** *The DOE 2011a reference is included in the reference section of the EBS, which is an attachment to the CDR. The CDR format was developed over a decade ago and for consistency has remained the same for all CDRs DOE has prepared.*

5. Page 6, Section 1.0: Please mention the thermal enrichment plant that was also in this area.

**DOE RESPONSE:** *The thermal enrichment plant has been added to the discussion in this section.*

6. Page 8, First bullet: This references “five EUs” but only 4 EUs are listed.

**DOE RESPONSE:** *The text of the number of EUs has been corrected to say “four.”*

7. Page 10, Paragraph 1: Please list the quantities and types of activation products and any ancillary materials present in the sodium shields.

**DOE RESPONSE:** *Detailed characterization of the building contents, including the sodium shields, will be performed as part of the disposition process.*

8. Page 10, Paragraph 5, Bullet: How will the threat of asbestos be addressed to new tenants using the former K-770 Scrap Yard Area?

**DOE RESPONSE:** *A table of the LUCs, including those applicable to the asbestos area, has been added to the documents and will be included in the deed to the property.*

9. Page 12, Second bullet: Please state the composition of the liquids in the F-29 UST.

**DOE RESPONSE:** *Text has been added indicating that the tanks are thought to have contained gasoline and diesel fuel prior to draining and closure in-place.*

10. Page 12, Paragraph after third bullet: During the State’s review of the *Final Proposed Plan for Soils in Zone 1 at East Tennessee Technology Park* (DOE/OR/01-2648&D3) per the Federal Facility Agreement, the FFA parties identified the need to verify the level of contamination on a single concrete slab in the area proposed for transfer. Consistent with General Comment #2, DOE should take the necessary actions to ensure the contamination on the slab meets the industrial use being proposed and remove the magenta signs warning of radioactive contamination on the slab.

**DOE RESPONSE:** DOE agrees and will ensure the slab meets the requirements for release and down-posting under DOE Order 458.1 prior to submission of final CDR for approval.

11. Page 14, Section 2.0, First full paragraph: Please add the following statement: “The exact nature and extent of groundwater contamination in the area has not been established.”

**DOE RESPONSE:** Text has been added as requested.

12. Page 14, First paragraph, Last sentence: Please include a statement that the EUs meet the requirements for NFA per the interim remedial action objectives and identify the appropriate CERCLA document.

**DOE RESPONSE:** Text and reference to the PCCRs have been added as requested.

13. Page 14, Third bullet: The dispositions of the sodium shields, Building K-1313-F, the slab, and the underlying soils should be determined prior to property transfer.

**DOE RESPONSE:** DOE is pursuing a final disposition for the shields. As discussed in Section 2.1, confirmatory sampling will be conducted prior to transfer of the building or the slab, and/or land under the slab.

14. Page 16, Figure 6: The groundwater in the area is not fully delineated vertically or horizontally. Please extend the plume to include the PCO spring. Also, please ensure the plume boundary is dashed unless there is sufficient data to confirm the boundary is known exactly.

**DOE RESPONSE:** Figure 6 has been revised to indicate a small area of contamination at the PCO spring, but the existing data do not indicate a hydrogeological connection or relationship between the K-27 plume and the PCO spring.

15. Page 19, Second bullet, Second dash: Please explain “elevated background levels.”

**DOE RESPONSE:** The process for developing the RLs is described in detail in the Zone 1 Interim ROD and is only summarized in the CDR. The “elevated background levels” refers to selected radionuclide COCs (i.e., <sup>226</sup>Ra and <sup>232</sup>Th) whose natural background level exceeds the Zone 1 risk goal. A footnote has been added to this wording in the CDR explaining this statement.

16. Page 20, Table 4.1: Should a list of tables be included in this document?

**DOE RESPONSE:** *The CDR format was developed over a decade ago and for consistency has remained the same for all CDRs that DOE has prepared.*

17. Page 26, Section 5, Last paragraph: How will EPA/625/R-92/016 be incorporated to ensure worker safety from vapor intrusion? How will the covenant be addressed to ensure the agreement follows new tenants in case of owner transfer?

**DOE RESPONSE:** *The requirements for vapor intrusion are included in the deed to the property. The Quitclaim deed, including the covenant for vapor intrusion, applies to the transferee and any successors.*

### **CDR Editorial Comments**

1. Page 8, Paragraph 1, Last sentence: “BORCE” is not included in the Acronyms list.

**DOE RESPONSE:** *BORCE has been added to the acronyms list.*

2. Page 8, Bullet 2: “CPD” is not included in the Acronyms list.

**DOE RESPONSE:** *CPD has been added to the acronyms list.*

3. Page 8, Bullet 3: “NFI” is not included in the Acronyms list.

**DOE RESPONSE:** *NFI has been added to the acronyms list.*

4. Page 10, Paragraph 1, Last sentence: Technically, isn’t D&D “Deactivation and Decommissioning” rather than “Decontamination and Decommissioning”?

**DOE RESPONSE:** *It can be used for both. DOE commonly uses D&D to refer to “Decontamination and Decommissioning.”*

5. Page 10, Paragraph 3: “USTs” is not included in the Acronyms list.

**DOE RESPONSE:** *UST has been added to the acronyms list.*

6. Page 10, Bullet at bottom of page: “ACMs” is not included in the Acronyms list.

**DOE RESPONSE:** *ACM has been added to the acronyms list.*

7. Page 13, All bullets: The PCCRs mentioned in these bullets should be included in a reference section for this document.

**DOE RESPONSE:** *The PCCRs are listed in the references for the EBS, which is an Attachment to the CDR. The CDR format was developed over a decade ago and for consistency has remained the same for all CDRs that DOE has prepared.*

8. Page 14, Bullet 1: The “Work Plan (2007)” mentioned here should be included in a reference section for this document.

**DOE RESPONSE:** *The “Work Plan” is listed in the references for the EBS, which is an Attachment to the CDR. The CDR format was developed over a decade ago and for consistency has remained the same for all CDRs that DOE has prepared.*

9. Page 14, Bullet 2: Should “and for two EUs (Z1-45 and -46) where the balance of the EU has been designated as the BORCE;” be “and for two EUs (Z1-45 and -46) ~~where~~ the balance of the EU has been designated as the BORCE;”?

**DOE RESPONSE:** *Text has been revised as suggested.*

10. Page 17, Section 2.2.1: The EPA draft guidance should be included in a reference section for this document.

**DOE RESPONSE:** *The draft guidance is listed in the references for the EBS, which is an Attachment to the CDR. The CDR format was developed over a decade ago and for consistency has remained the same for all CDRs that DOE has prepared.*

11. Page 26, Paragraph 2: The EPA guidance for radon should be included in a reference section for this document.

**DOE RESPONSE:** *The radon guidance is listed in the references for the EBS, which is an Attachment to the CDR. The CDR format was developed over a decade ago and for consistency has remained the same for all CDRs that DOE has prepared.*

12. Page 27, Section 6.1, Paragraph 2: The NEPA document should be included in a reference section for this document.

**DOE RESPONSE:** *The ETTP EA is listed in the references for the EBS, which is an Attachment to the CDR. The CDR format was developed over a decade ago and for consistency has remained the same for all CDRs that DOE has prepared.*

### **EBS-Specific Comments**

1. Pages 1-4 and 3-4, Figure 1.3 and Table 3.1: There is an inconsistency in the information provided in Figure 1.3 and Table 3.1. Figure 1.3 shows that the NFA for EU Z1-10 was approved while Table 3.1 states that the NFA was

recommended. Please make sure that the information regarding all of the EUs is consistent throughout the document.

**DOE RESPONSE:** *The table has been corrected to indicate that the NFA for EU Z1-10 is approved.*

2. Page 3-6, First paragraph: In three instances, please change wording from “a minimum of 10 ft” to “a maximum of 10 ft.”

**DOE RESPONSE:** *Text has been revised as requested.*

3. Pages 6-1 through 6-23: Figures that show the sampling locations for EUs Z1-10 through Z1-44 and EU Z1-47 should be included in this section.

**DOE RESPONSE:** *A large fold-out map of the transfer footprint, the EU boundaries, and all DVS sample locations has been added to the EBS.*

4. Pages 6-1 through 6-23: The document states that no DVS soil samples were collected from EUs Z1-25, -34, -36, -37, and -45. All of these areas are in proximity to an industrial site and received deposition from a coal plant. Sampling is prudent and justified at these locations.

**DOE RESPONSE:** *The DQO scoping document and the work plan were developed collaboratively with the FFA parties. These EUs were evaluated under the DVS and have been approved by EPA and TDEC for NFA for soils for industrial use, as described in the associated PCCRs.*

5. Page 6-15, EU Z1-26: Remedial activities for radionuclides removed a few hot spots lowering the average for the site. Additional hot spots were averaged out. It seems the removal of all areas above RL would be a more acceptable method of dealing with contamination.

**DOE RESPONSE:** *Any soils with contamination above Zone 1 ROD Max RLs were removed. The DVS process, including the approach for data evaluation, has been approved by EPA and TDEC.*

## 7.2 Public Comments

The CDR package was available for public review from **DATE TO BE DETERMINED**, and the availability of the documents for review was announced in three area newspapers and in the online version of one paper.