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FINAL ENVIRONMENTAL ASSESSMENT

KINGSTON FOSSIL PLANT STRUCTURE RAZING

Roane County, Tennessee

PREPARED BY:
TENNESSEE VALLEY AUTHORITY

JUNE 2011

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ACRONYMS, ABBREVIATIONS, AND SYMBOLS

≤	Less than or equal to
µg/m^3	Micrograms per cubic meter
AADT	Average annual daily traffic
ACM	Asbestos-containing material
APE	Area of potential effects
BG(s)	Block group(s)
BMPs	Best management practices
C&D	Construction and demolition
CEC	Categorical exclusion checklist
CFR	Code of Federal Regulations
CO	Carbon monoxide
CT	Census tract
dBA	A-weighted decibels
EA	Environmental assessment
ERM(s)	Emory River Mile(s)
ESA	Endangered Species Act
FEMA	Federal Emergency Management Agency
FMCSA	Federal Motor Carrier Safety Administration
I-	Interstate Highway
ibid	Abbreviation for the Latin term, *ibidem*, meaning “in the same place”; refers to the immediately preceding work cited
KIF	Kingston Fossil Plant
LOS	Level of service
mg/m^3	Milligrams per cubic meter
NAAQS	National Ambient Air Quality Standards
n.d.	Indicates “no date,” or date which Web site was accessed is unknown
NEPA	National Environmental Policy Act
NESHAP	National Emission Standards for Hazardous Air Pollutants
NHPA	National Historic Preservation Act
NO_2	Nitrogen dioxide
NPDES	National Pollutant Discharge Elimination System
NRHP	National Register of Historic Places
O_3	Ozone
OSHA	Occupational Safety and Health Act
Pb	Lead
PCB(s)	Polychlorinated biphenyl(s)
PM	Particulate matter
$PM_{2.5}$	Particulate matter whose particles are less than or equal to 2.5 micrometers
PM_{10}	Particulate matter whose particles are less than or equal to 10 micrometers
ppb	Parts per billion
ppm	Parts per million
SHPO	State Historic Preservation Officer
SO_2	Sulfur dioxide
Sq Ft	Square foot
SR	State Route
SWPPP	Storm Water Pollution Prevention Plan
TDEC	Tennessee Department of Environment and Conservation
TVA	Tennessee Valley Authority
US	United States Highway
USDOT	United States Department of Transportation
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
VSMP	Vital Signs Monitoring Program
YB	Year built

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CHAPTER 1

1.0 PURPOSE OF AND NEED FOR ACTION

1.1. The Decision

Tennessee Valley Authority (TVA) purchased properties near the Kingston Fossil Plant (KIF) ash spill and ash recovery operation areas as part of its continuing efforts to address the impacts of the December 2008 spill and cleanup. TVA purchased property based on direct impact from the spill or from remediation. Now, TVA has determined that some of the approximately 105 houses and ancillary structures located on the approximately 900 acres acquired need to be removed to meet TVA business needs and to expand the buffer surrounding the KIF Reservation boundary. Initially, approximately 66 houses, 83 outbuilding structures, and seven pools or ponds were identified as needing to be removed because of building code requirements, TVA needs, habitability issues, or for buffer requirements. These locations are identified in an overview in Figure 1-1, and Figures 1-2 through 1-5 present a closer view of these areas. Figure 1-6 provides a summary of the property to be disposed. Tables 1-1 through 1-7 indicate the map number, street address, and square footage of the houses that would be removed. For estimating purposes, each outbuilding is assumed to be approximately 300 square feet.

TVA has not made a final determination on the total number of structures to be removed. This analysis will consider the removal of the identified 66 houses and associated structures as well as the removal of all structures on the remaining tracts so that all potential impacts can be analyzed. However, TVA plans to retain some of these properties as permanent extensions to the existing plant boundary and has been and is continuing to evaluate potential uses for these sites. The disposition of the remaining houses and associated structures has not been determined at this time, and a strategy for any remaining structures would be developed following the cleanup.

1.2. Other Pertinent Environmental Reviews or Documentation

- *Initial Emergency Response Action for the Kingston Fossil Plant Ash Dike Failure Environmental Assessment* (TVA 2009a)
  This environmental assessment (EA) evaluated repair and restoration of railroad and roadway, installation of temporary rock structures, stabilization of the slide area, demolition of damaged houses, clean up of debris, and collection of cenospheres in response to the ash dike failure at KIF.

- *Emergency Dredging for the Kingston Fossil Plant Ash Dike Failure Final Environmental Assessment* (TVA 2009b)
  This EA evaluated the dredging and disposal options for ash that spilled into the river as a result of an ash dike failure at KIF.

1.3. The Scoping Process

TVA initially prepared a categorical exclusion checklist (CEC), No. 22352, during preliminary, internal scoping. Analysis in the CEC determined that several resources would not be impacted by the proposed action and do not require further analysis. Potential effects related to aquatic ecology, endangered and threatened species, wetlands, floodplains, navigation, recreation, prime farmland, managed areas and ecologically

significant sites, nationwide rivers inventory, and global climate change have been considered but, because of the nature of the action, did not require detailed evaluation.

The resources potentially affected by the proposed project that warrant further evaluation in this EA include the following:

- Solid and hazardous wasteTransportation
- Air resources
- Socioeconomics and Environmental Justice
- Visual resources
- Water resources including surface water and groundwater
- Land Use
- Terrestrial Ecology
- Noise
- Archaeological and Historic Resources

The *TVA Safety Manual* (2009c) would be strictly adhered to during this demolition/removal project. The safety program/manual is designed to identify actions required for the control of hazards in all activities, operations, and programs. It also establishes responsibilities for implementing Section 19 of the Occupational Safety and Health Act (OSHA) of 1970 (OSHA act requirements issued by the Secretary of Labor).

1.4. Public and Intergovernmental Review

A draft EA was posted on TVA's Web site for public comment from May 5, 2011, through May 20, 2011. Electronic copies of the EA were sent to the National Park Service, United States Environmental Protection Agency (USEPA), Tennessee Department of Environment and Conservation (TDEC), Tennessee Wildlife Resources Agency, the executive of Roane County, and the mayors of Kingston, Harriman, and Rockwood. In addition, TVA issued a press release to local and regional media outlets concerning the proposed project. Only one comment was received from a single individual identifying an issue that was already addressed in the EA; therefore, no response was necessary.

1.5. Necessary Federal Permits or Licenses

- TDEC special waste disposal permits for disposal of asbestos and treated lumber
- TDEC General National Pollutant Discharge Elimination System (NPDES) Permit for discharges of storm water associated with construction activities for one or more acres of disturbance
- TDEC Storm Water Pollution Prevention Plan (SWPPP) to outline the best management practices (BMPs) for the General NPDES Permit

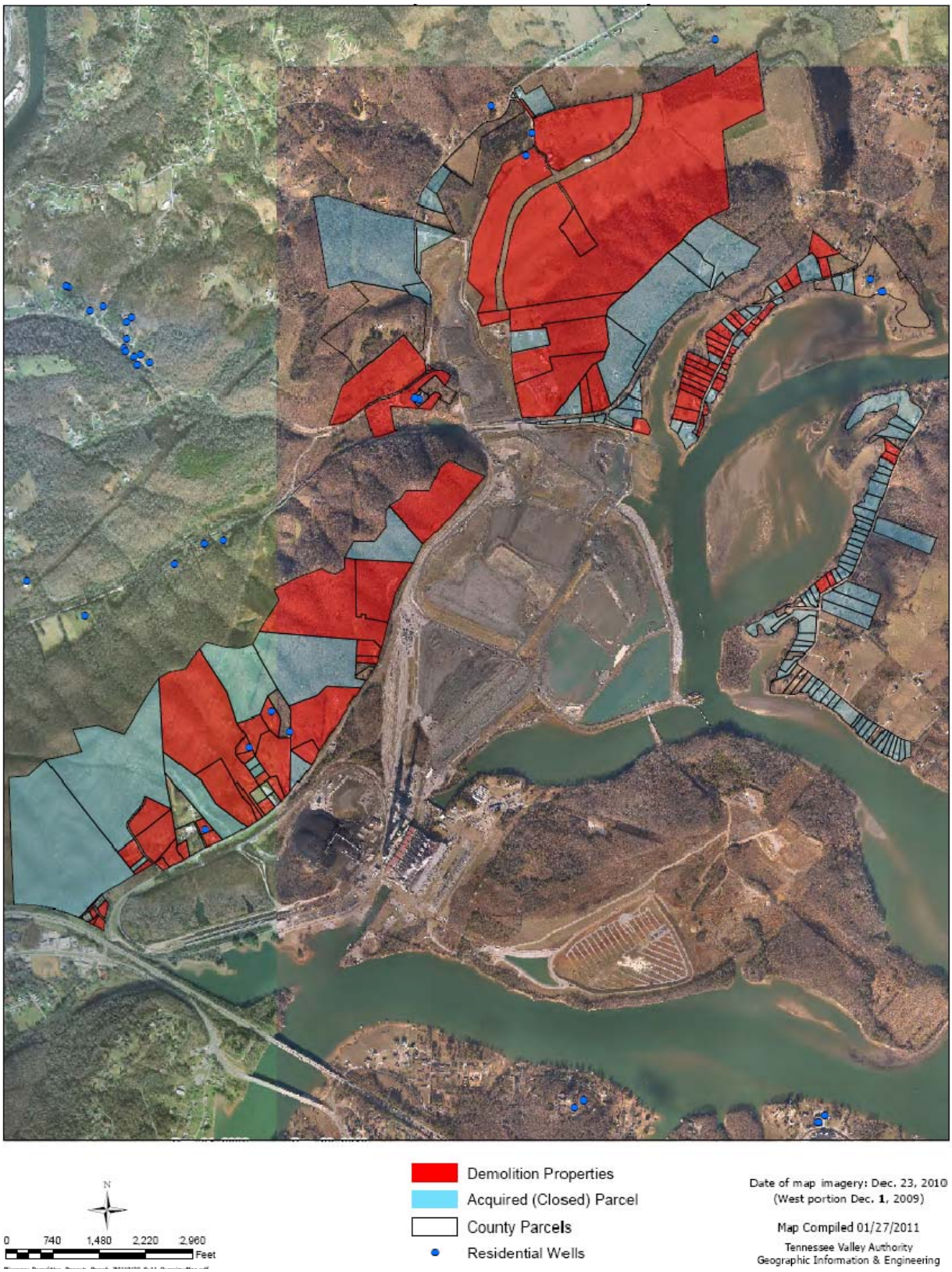

Figure 1-1. Demolition Properties – Overview Map

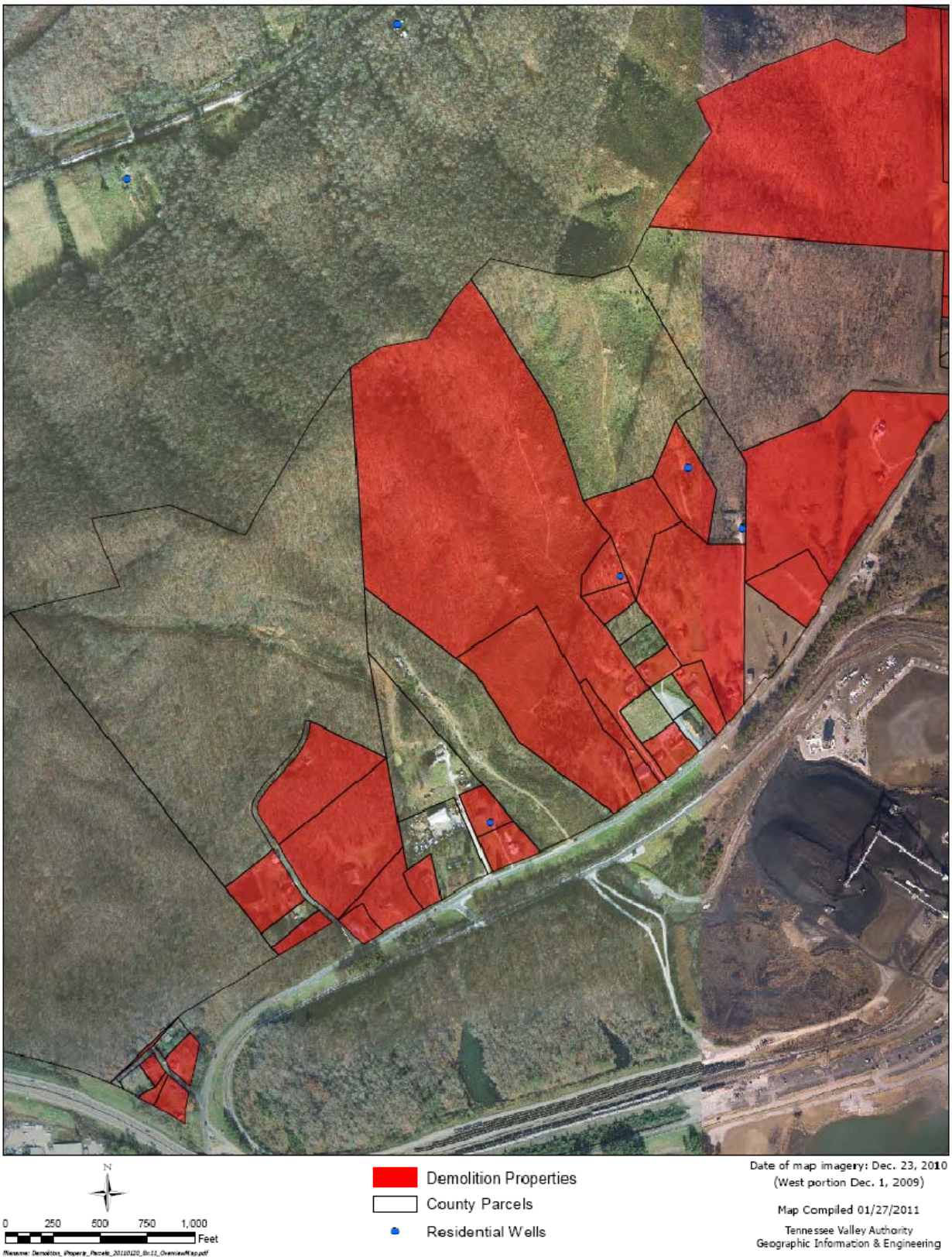

Figure 1-2. Demolition Properties – Swan Pond Southwest

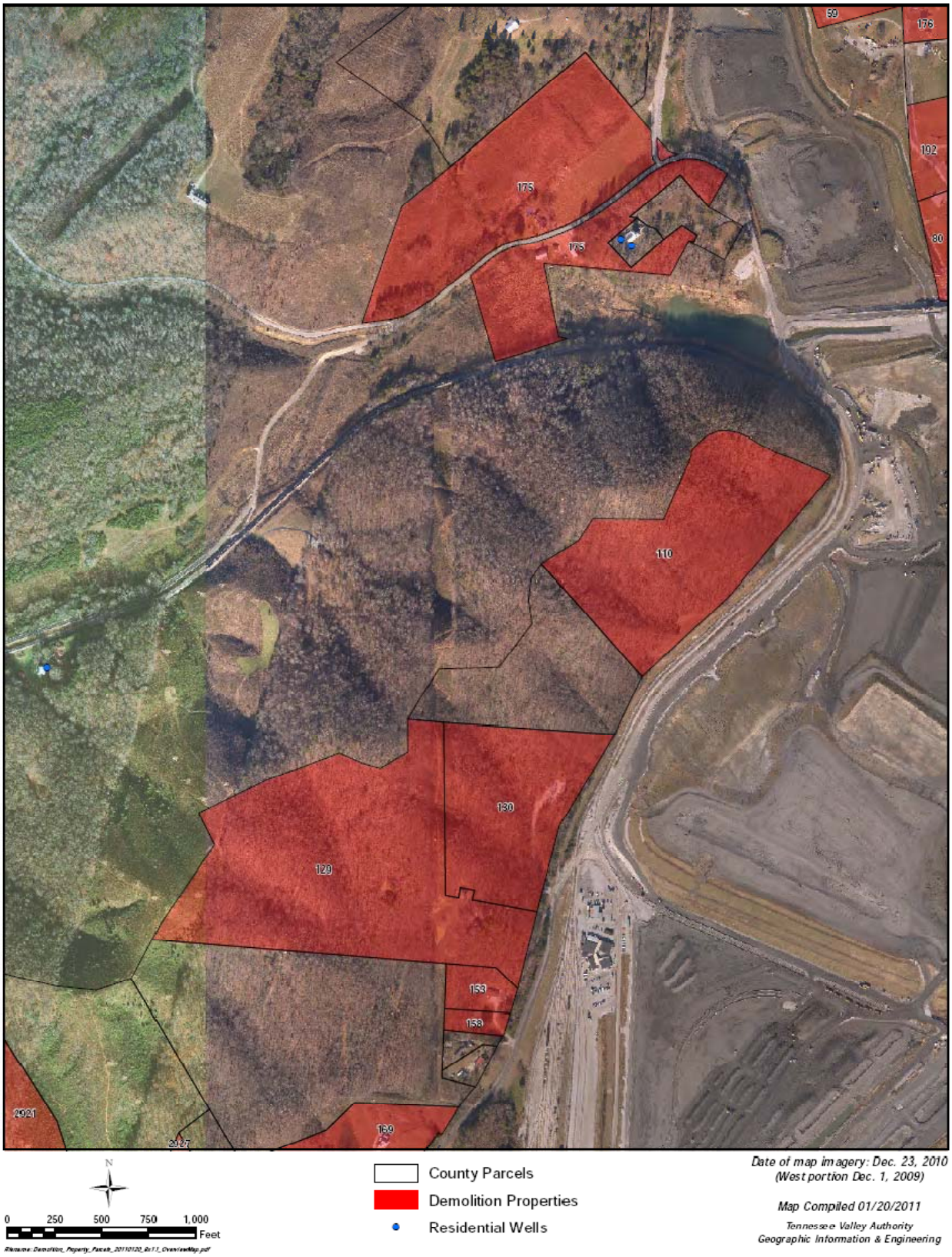

Figure 1-3. Demolition Properties – Swan Pond Northeast

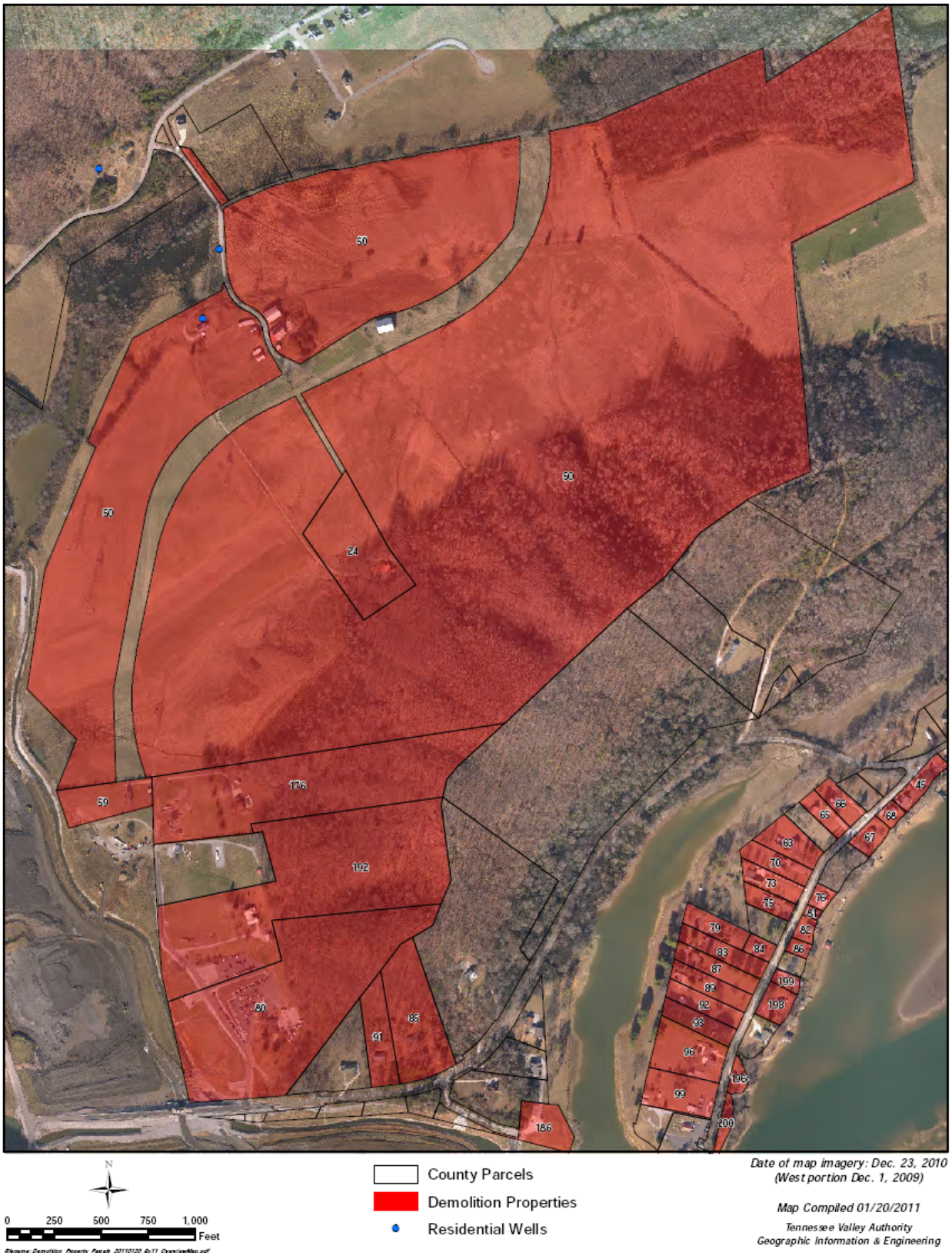

Figure 1-4. Demolition Properties – Swan Pond Circle

Figure 1-5. Demolition Properties – Emory River

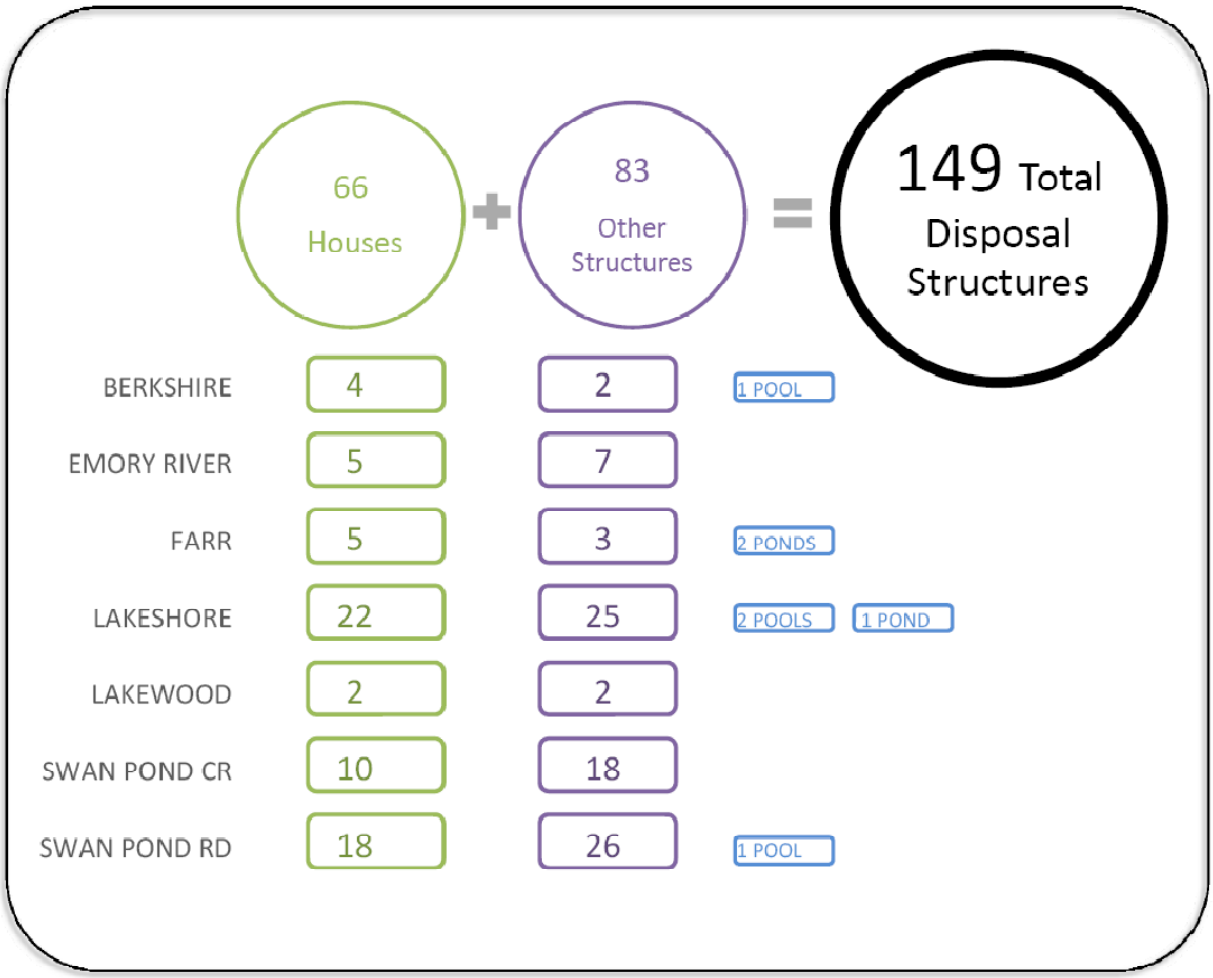

Figure 1-6. Kingston Residential Properties Disposal Summary

Table 1-1. Berkshire Lane (6 structures; 1 pool/pond)

Map ID	Street No.	Street Name	House	Sq Ft*	Brick/ Stone	BSMT	YB	Out Buildings	Pools & Ponds	Detached Garage	Dock
80	130	Berkshire Ln	1	4,352	Y	Y	1986	*Operations Office*			
192	134	Berkshire Ln	1	4,464	Y	Y	1985	1		1	
176	136	Berkshire Ln	1	5,472	Y	Y	1988		1 pool		
59	137	Berkshire Ln	1	3,802	Y	Y	1994				

*Sq Ft based on outside dimensions, excluding any porches

Table 1-2. Emory River Road (12 structures)

Map ID	Street No.	Street Name	House	Sq Ft*	Brick/ Stone	BSMT	YB	Out Buildings	Pools & Ponds	Detached Garage	Dock
178	394	Emory River Rd	*Trailer sold by Investment Recovery*								
179	396	Emory River Rd	*Trailer sold by Investment Recovery and removed*								
112	424	Emory River Rd	1	3,036		Y	1989	2		1	
188	474	Emory River Rd	1	5,818		Y	1974	2			
135	500	Emory River Rd	1	2,080		Y	1974	1			
• 136	510	Emory River Rd	1	1,560		Y	1999				1 concrete boat ramp
2929	618	Emory River Rd	1	3,364	Y	Y	1993				

• Asbestos test received positive *Sq Ft based on outside dimensions, excluding any porches

Table 1-3. Farr Lane (8 structures; 2 pools/ponds)

Map ID	Street No.	Street Name	House	Sq Ft*	Brick/ Stone	BSMT	YB	Out Buildings	Pools & Ponds	Detached Garage	Dock
3676	104	Farr Ln	1	2,688		Y	1960				
• 3665	112	Farr Ln	1	2,212	Y	Y	1960				
3677	115	Farr Ln	1	1,529			1998	1	1 fountain pond		
• 3672	121	Farr Ln	1	2,928		Y	1960		1 pond		
• 3664	154	Farr Ln	1	2,016	Y	Y	1955	2			

• Asbestos test received positive *Sq Ft based on outside dimensions, excluding any porches

Table 1-4. Lakeshore Drive (47 structures; 3 pools/ponds)

	Map ID	Street No.	Street Name	House	Sq Ft*	Brick/ Stone	BSMT	YB	Out Buildings	Pools & Ponds	Detached Garage	Dock
†•	45	101	Lakeshore Dr	1	2,916		Y	1958			1	1
†	45	103	Lakeshore Dr	1	4,310	Y	Y	2000				
†	68	117	Lakeshore Dr	1	4,012	Y	Y	2000				1
†	66	118	Lakeshore Dr	1	3,712	Y	Y	1989				1
	65		Lakeshore Dr	N/A	N/A	N/A	N/A	N/A			1	
†•	67	119	Lakeshore Dr	1	3,618	Y	Y	1973			1 carport	
•	63	130	Lakeshore Dr	1	3,480	Y	Y	1976		1 pool		
•	70	134	Lakeshore Dr	1	2,893			1979				
•	76	137	Lakeshore Dr	1	2,400		Y	1971	2			
†	73	138	Lakeshore Dr	1	2,784		Y	2003	1	1 small pond		
	81	141	Lakeshore Dr	1	2,672		Y	1974	1			
	75	142	Lakeshore Dr	1	2,688		Y	1984	1	1 pool	1	
	82	145	Lakeshore Dr	1	2,689	Y	Y	1964	1			
	86	149	Lakeshore Dr	1	540		Y	1971				
•	84	154	Lakeshore Dr	1	1,440	Y		1972				
	79	156	Lakeshore Dr	1	1,959	Y		1971	1			
•	199	157	Lakeshore Dr	1	1,428	Y		1951	1			
	83	158	Lakeshore Dr	*Trailer to be sold by Investment Recovery & Removed*					1			
	198	161	Lakeshore Dr	1	2,406	Y		1955	1			
•	87	162	Lakeshore Dr	1	1,660			1981	1			
	89	166	Lakeshore Dr	1	2,040			1976				
	92	166	Lakeshore Dr	*Trailer sold by Investment Recovery & Removed*					1		1	
	93	172	Lakeshore Dr	*Trailer & Storage Shed sold by Investment Recovery & Removed*								
	197	173	Lakeshore Dr	1	4,320	Y	Y	1987			1	1
	196	179	Lakeshore Dr	1	2,944		Y	1988				1 fishing platform
	200	189	Lakeshore Dr	1	1,573	Y		1954			1	1
	99	190	Lakeshore Dr	*House demolished and removed by CP*								

• Asbestos test received positive
† Chemical/paint removal not complete

*Sq Ft based on outside dimensions, excluding any porches

Table 1-5. Lakewood Lane (4 structures)

	Map ID	Street No.	Street Name	House	Sq Ft*	Brick/ Stone	BSMT	YB	Out Buildings	Pools & Ponds	Detached Garage	Dock
•	3355	110	Lakewood Ln	1	2,340			1950			1	
	3356	123	Lakewood Ln	1	1,517			1950				
	3359		Lakewood Ln (Across street from 110)	N/A	N/A	N/A	N/A	N/A			1	

• Asbestos test received positive

*Sq Ft based on outside dimensions, excluding any porches

Table 1-6. Swan Pond Circle Road (28 structures)

	Map ID	Street No.	Street Name	House	Sq Ft*	Brick/ Stone	BSMT	YB	Out Buildings	Pools & Ponds	Detached Garage	Dock
•	91	173	Swan Pond Cr Rd	1	3,000		Y	1972				
	186	188	Swan Pond Cr Rd	N/A	N/A	N/A	N/A	N/A			1	
•	85	189	Swan Pond Cr Rd	1	2,820	Y	Y	1978				
•	90	208	Swan Pond Cr Rd	1	8,036			1970				
	30	301	Swan Pond Cr Rd	1	3,550		Y	1999			1 car cover	
	37	399	Swan Pond Cr Rd	1	3,550		Y	1999				
•	38	419	Swan Pond Cr Rd	1	1,918		Y	1954	1			
	36	427	Swan Pond Cr Rd	1	1,464		Y	1989	2			
	29	445	Swan Pond Cr Rd	N/A	N/A	N/A	N/A	N/A	1 barn			
•	35	445	Swan Pond Cr Rd	1	4,123			1910			1	
•	50	1305	Swan Pond Cr Rd	1	2,596	Y	Y	1952	4		1 car cover	
	24	1307	Swan Pond Cr Rd	1	3,493		Y	2000	4 barns		2 car covers	

• Asbestos test received positive *Sq Ft based on outside dimensions, excluding any porches

Table 1-7. Swan Pond Road (44 structures; 1 pool/pond)

	Map ID	Street No.	Street Name	House	Sq Ft*	Brick/ Stone	BSMT	YB	Out Buildings	Pools & Ponds	Detached Garage	Dock
	3671	911	Swan Pond Rd	1 Renter Occupied	1,697			1954	1			
•	3673	919	Swan Pond Rd	1	1,674			1965				
	3668	937	Swan Pond Rd	*Trailer to be sold by Investment Recovery & Removed*							1 car cover	
•	3670	939	Swan Pond Rd	1	2,880			1930	1		1 carport	
•	2953	967	Swan Pond Rd	1	1,192			1946	1			
	2961	973	Swan Pond Rd	1	3,672			1950	1 lean-to			
	2961	975	Swan Pond Rd	*Trailer sold by Investment Recovery & Removed*								
•	2921	977	Swan Pond Rd	1	1,773			1950	1		1	
†•	2957	985	Swan Pond Rd	1	1,172			1950	1		1 car cover	
	2960	987	Swan Pond Rd	Parsonage	*2000***	Y		*1987***	2			
	2960	987	Swan Pond Rd	Fellowship Hall	*1500***	Y		*1989***	2			
	2933	993	Swan Pond Rd	1 doublewide	*1800***			*1992***				
	2944	993	Swan Pond Rd	N/A	N/A	N/A	N/A	N/A			1	
	2950	993	Swan Pond Rd	1 singlewide	*800***			*1980***				
•	2941	999	Swan Pond Rd	1	2,556		Y	1952			1 carport	
	2927	1015	Swan Pond Rd	1	1,360			1990	1 outbuilding 1 animal containment area		1 carport	
	2948	1025	Swan Pond Rd	N/A	N/A	N/A	N/A	N/A			1	
	169	1049	Swan Pond Rd	1	3,321		Y	2004	1 barn			
•	158	1101	Swan Pond Rd	1	696			1935				
	153	1107	Swan Pond Rd	*Trailer to be sold by Investment Recovery & Removed*							1	
•	129	1125	Swan Pond Rd	1	3,737	Y	Y	1972	1			
	130	1133	Swan Pond Rd	*TVA Observation Deck*								
	175	1428	Swan Pond Rd	1	3,502			1935	2 barns	1 pool	1	
	175	1428	Swan Pond Rd	1	864		Y	1930				

• Asbestos test received positive *Sq Ft based on outside dimensions, excluding any porches
† Chemical/paint removal not complete **Approximate square footage (county did not assess buildings)

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CHAPTER 2

2.0 ALTERNATIVES INCLUDING THE PROPOSED ACTION

2.1. Alternatives

This EA documents the evaluation of two reasonable alternatives: the No Action and Action Alternatives. The No Action Alternative would not involve demolition of the structures. The Action Alternative would involve demolition of some or all of the structures acquired. Structures not being demolished would be included in a strategy to be developed following cleanup.

2.1.1. The No Action Alternative

Under the No Action Alternative, TVA would not demolish the structures. Environmental conditions in the project area would not change and anticipated health and safety benefits would not occur in the region. Adoption of this alternative would not meet TVA's objectives.

2.1.2. The Proposed Action Alternative – Demolish Structures

Under the Action Alternative, TVA would demolish approximately 66 houses and associated structures of the 105 houses recently acquired on the impacted property in the immediate vicinity of KIF. Structures in the project area would be demolished and construction debris and waste materials would be removed from the area and properly disposed of at approved facilities in compliance with Tennessee waste regulations and laws. Any houses and structures not demolished would be included in a strategy to be developed following cleanup. These structures consist of houses, outbuildings, barns, decks, and docks. Demolition activities are scheduled to begin in late spring 2011.

It is TVA's intent to reduce significant environmental impacts where practicable in a cost-conscious manner. Most of the property TVA acquired is residential. TVA plans to retain some of these properties as permanent extensions to the existing plant boundary and has been and is continuing to evaluate potential uses for these sites. Activities associated with removing structures would involve the following:

- Recycling or making available for reuse construction and demolition material, when practicable, in accordance with legal requirements
- Removing and disposing of all asbestos-containing material (ACM)
- Using waste minimization techniques and on-site segregation of waste practices, when practicable
- Complying with all Tennessee guidelines regarding disposal of waste materials, including ACM abatement activities prior to demolition, treated lumber, and creosote poles
- Preserving all vegetative buffers along the shorelines
- Segregating and carefully determining disposal and recycling options for solid waste, tires, and metal items, some of which would require special waste permits

- Filling septic tanks and over drilling and grouting the groundwater wells
- Demolishing structures, removing construction and debris materials from the area and properly disposing of construction and debris materials
- Revegetating affected areas with native species or nonnative, noninvasive species
- Filling of basements (TVA's peninsula borrow area or any other approved borrow source in the area, along with concrete from driveways and other areas, can be used for this purpose)

2.2. Comparison of Alternatives

Table 2-1 summarizes and compares impacts by alternative for each resource area evaluated.

Table 2-1. Summary and Comparison of Alternatives by Resource Area

Issue Area	Impacts From No Action Alternative	Impacts From Proposed Action Alternative
Solid Waste	The houses would continue to deteriorate, creating a safety hazard and potentially causing exposure to asbestos-containing material.	If all the houses and associated structures purchased were removed, approximately 52,000 cubic yards of landfill space would be utilized.
Transportation	There would be no change from current conditions.	The level of service for the common route to Interstate Highway 40, which is Swan Pond Road to United States Highway 70 and then to Pine Ridge Road, is expected to remain the same. The increase in potential for accidents would be minor.
Air Resources	There would be no change from current conditions.	Impacts from demolition and hauling activities would be temporary and minor.
Socioeconomics and Environmental Justice	The houses would deteriorate, causing health and safety concerns, creating negative aesthetic qualities and potentially causing a drop in the nearby property values.	There would be potential health and safety benefits, increased aesthetic qualities, and a potential for increased property values. Effects to environmental justice would be minor.
Visual Resources	Deterioration of the structures over time would have negative impacts and would adversely affect the aesthetic qualities of the area.	There would be beneficial visual changes by restoring the area to a naturally appearing landscape, increasing scenic attractiveness.

Issue Area	Impacts From No Action Alternative	Impacts From Proposed Action Alternative
Water Resources	Potential surface water and groundwater impacts could occur as the structures deteriorate.	With the use of best management practices, water quality impacts would be minimal. Reduction in the concentrated storm water runoff from impervious surfaces is expected to reestablish a more natural runoff regime. Improvements to groundwater quality are likely from the filling of septic tanks.
Land Use	Formerly occupied and now deserted residential area would provide reduced health and safety benefits.	Open public shoreline lands would provide a more natural setting facilitating anticipated health and safety benefits.
Terrestrial Ecology	There would be no change from current conditions.	No impacts are expected with application of avoidance measures.
Noise	There would be no change from current conditions.	Noise impacts would be insignificant.
Archaeological and Historic Resources	There would be no change from current conditions.	None

2.3. The Preferred Alternative

TVA's Preferred Alternative is the Action Alternative, i.e., to demolish the structures.

2.4. Summary of Commitments and Mitigation Measures for the Proposed Action Alternative

Routine and compliance measures include the following:

- Waste materials would be removed from the area and properly disposed of at approved solid waste facilities or recycled in compliance with Tennessee waste regulations and laws.

- Asbestos-containing material (ACM) abatement would be conducted in accordance with KIF Work Spec-122210 Specification for Asbestos Abatement for the TVA-Owned Houses and in accordance with all federal, state, and local laws and regulations.

- If necessary, emissions from open demolition areas, paved, and unpaved roads would be mitigated using wet suppression.

- All residential groundwater wells, underground utilities, and septic tanks would be closed. Wells would be over drilled and grouted. All well closures would comply with the "Chapter 1200-4-9 Water Well Licensing Regulations and Construction Standards" (TDEC 2005).

- TVA would work with regional gas and water utility companies to remove and/or cap all underground utilities in accordance with industry standards and regulatory requirements.

- All basements, pools, and ponds on the property would be filled in with fill dirt. If the infrastructure were left in place, boreholes would be placed into the structure to allow for proper soil percolation and drainage. Approximately 7,500 cubic yards of fill would be required for the entire project. This fill would be obtained from the approved KIF borrow area on the peninsula or any other approved borrow source in the area.

- A General NPDES Permit for Discharges of Storm Water Associated With Construction Activities (TDEC 2011) for the entire project site would be obtained. As part of this application, an SWPPP would be developed and implemented to control and confine sediment to the project site. This plan would identify specific BMPs to address demolition-related activities that would be adopted to minimize storm water impacts. A complete list of BMPs and locations would be detailed in the site SWPPP.

Special commitments identified for the proposed action are that:

- TVA's request for proposals would require potential bidders to consider reducing the potential impact of KIF trucking activities upon the environment. Contractor shall take into account such factors as air pollution, erosion control, noise control, solid waste disposal, and wastewater disposal, among other things. The contract would require that truck owners properly maintain trucks, including tune-ups. Truck routes would avoid schools, historic districts, and downtown areas to the extent possible. Additional requirements such as use of ultra-low sulfur diesel fuel and minimizing idling time could also be required.

- Demolition activities occurring immediately adjacent to the location of tree swallow boxes would not occur during the breeding season for this species, March 1 through July 1 as depicted in Figure 3-6 (in Chapter 3). In addition, sufficient buffers have been added around tree swallow box locations to help minimize disturbance to nesting birds. Demolition would also not occur on property #178 between February 1 and July 15 to minimize disturbance to nesting osprey.

- All denuded areas would be vegetated. Where soil disturbance would occur, the area would be ultimately stabilized and vegetated with native or nonnative, noninvasive grasses and mulched, as described in *A Guide for Environmental Protection and Best Management Practices for Tennessee Valley Authority Transmission Construction and Maintenance Activities* (Muncy 1999).

- During vegetation, application of fertilizers would be avoided in the areas where karst features and springs occur to prevent groundwater contamination.

- Portable toilets would be provided for the additional construction workforce as needed. These toilets, in addition to the previously mentioned septic tanks cleanout, would be pumped out as needed, and the sewage would be transported by tanker truck to a publicly owned wastewater treatment works that accepts pumpout.

- The equipment used for site preparation and debris removal would be inspected for properly functioning mufflers prior to operation. These operations would be limited to daylight hours.

CHAPTER 3

3.0 AFFECTED ENVIRONMENT

3.1. Solid and Hazardous Waste

3.1.1. Affected Environment

TVA has an overall contract for disposal of municipal waste for all TVA facilities. This contract can include disposal of construction and demolition (C&D) waste, or TVA can bid out a specific project in an attempt to lower the total disposal cost. This action would typically be undertaken only on projects where there would be sufficient volumes of waste to potentially reduce the total cost of disposal. This project qualifies under that condition. In addition to the typical C&D, waste asbestos and treated lumber have been identified as waste streams, which would need special waste permits for disposal.

The status of KIF as a conditionally exempt small quantity generator of hazardous waste would not change as a result of either of the alternatives described below.

3.1.2. Environmental Consequences

3.1.2.1. No Action Alternative

Under the No Action Alternative, TVA would not demolish the structures and the material would not be sent to local landfills. Environmental conditions in the project area would not change, and anticipated health and safety benefits would not occur in the region. Adoption of this alternative would not meet TVA's safety standards or objectives pertaining to TVA needs and expanding the buffer surrounding the KIF Reservation boundary.

3.1.2.2. Proposed Action Alternative

Under the Action Alternative, TVA would convert property impacted by the TVA ash spill in the immediate vicinity of KIF by changing residential areas to TVA power property. The structures in the project area would be demolished, and construction debris and waste materials would be removed from the area and properly disposed of at approved solid waste facilities or recycled in compliance with Tennessee waste regulations and laws.

Following acquisition of the subject properties, TVA performed a detailed survey of the structures in order to identify and classify hazardous materials located on the tracts. Following this survey, all materials identified as hazardous in accordance with laws of the State of Tennessee were collected, properly labeled, packaged, and transported for disposal at the hazardous waste disposal facility at Emelle, Alabama. Subsequent to the initial removal of household hazardous wastes, a few polychlorinated biphenyl- (PCB) containing transformers were discovered. These transformers would also be removed, labeled, containerized, manifested, and shipped for proper disposal.

In addition to the hazardous material survey, an inventory of ACM was also completed. This survey included the collection and testing of samples that had the potential of being ACM as defined by National Emission Standards for Hazardous Air Pollutants (NESHAP) regulations. Prior to the commencement of the proposed action, TVA would contract with an asbestos abatement contractor currently licensed by the State of Tennessee Department of Commerce and Insurance Board for Licensing Contractors. ACM abatement

would be conducted in accordance with KIFWork Spec-122210 Specification for Asbestos Abatement and in accordance with all federal, state, and local laws and regulations.

Demolition of the structures would be completed using standard heavy equipment (track hoes, dozers, etc.). As deemed appropriate, debris would be segregated for recycling/reuse where and when possible. Nonrecyclable debris would be placed in roll off containers or dump trucks and taken to a solid waste facility permitted by TDEC.

For the purposes of this evaluation, a method published in the Federal Emergency Management Agency (FEMA) Publication 329 (FEMA 2010) was utilized to estimate the volume of debris resulting from this activity. This method utilizes the square footage of the razed home or building multiplied by a factor, which was devolved and refined based on actual field experience following natural disasters. A factor of .20 is used for frame houses and .33 for general structures such as outbuildings. Since the size of the outbuildings varies greatly, 300 square feet was used as a typical size for this evaluation.

Of the structures located on the subject properties, 66 houses and 83 ancillary structures (barns, detached garages, carports, sheds, and boat docks) are being considered for demolition. Using the FEMA Field Estimating Method (FEMA 2010), there is estimated to be approximately 36,250 cubic yards of construction debris predominantly containing a mixture of conventional inert building materials consisting of roofing shingles, glass, wood, brick, block, concrete, dry wall, paper, unsalvageable metals, fiberglass, soil material, gravel, and plastic. Material deemed recyclable or reusable would be segregated and treated as such. Pressure treated lumber and creosote poles from decks, fences, docks, barns, boathouses, etc., would be segregated and treated as special waste in accordance with Rule 1200-1-7-.01(4) (TDEC 2006). This material would be placed in lined and covered roll-off containers and taken for disposal in a permitted Class I landfill. Debris consisting of natural rock, dirt, stumps, pavement, concrete and rebar, and/or brick rubble may be used as fill material in accordance with Rule 1200-1-7-.02(1)(b)3.(xiii) (TDEC 2006). All other nonrecyclable demolition debris would be loaded in roll-off containers or trucks and transported to a permitted landfill.

In addition to the 149 structures proposed for razing, there are several additional houses and ancillary structures for which TVA has not yet made a final disposition determination. Based on this evaluation, using the FEMA Field Estimating Method, along with the estimated 300 square feet for each outbuilding proposed to be razed, the houses in this area would constitute approximately 45 percent of the calculated total volume of demolition debris or an additional 16,300 cubic yards of waste material.

For this evaluation, the following permitted landfills are being considered for final disposal of nonrecyclable materials generated by this action:

Volunteer Waste
Yarnell C&D Landfill (C&D waste only)
1550 Lamons Quarry Lane
Knoxville, TN 37932

Allied Waste
Middle Point Landfill
750 East Jefferson Pike
Murfreesboro, TN 37130

Waste Management
Chestnut Ridge Landfill
240 Fleenor Mill Road
Heiskell, TN 37754

Waste Connections
Meadow Branch Landfill
233 County Road 166
Athens, TN 37303

According to TDEC personnel, all of these facilities are not near capacity and, therefore, have adequate space remaining for disposal of the debris that would be generated by the proposed project. Cumulative impacts would consist of the filling of approximately 52,000 cubic yards of available landfill space if all of the houses were to be demolished. Under this alternative, TVA would transfer demolition debris by truck to these permitted landfills as described in Section 3.2 of this EA.

3.2. Transportation

3.2.1. Affected Environment

Roadway, railway, and waterway modes of transportation can serve KIF Reservation. However, there are currently no barge facilities on site. Much of the property along the Clinch River a few miles upstream from KIF belongs to the United States Department of Energy; however, shoreline residential properties and recreational areas are in close proximity to the site.

KIF adjoins Swan Pond Road just off United States Highway (US) 70. US 70 is a principal, four-lane divided highway with wide shoulders traversing a gently rolling suburban area in an east-west direction. Swan Pond Road is a rural, two-lane road. Trucks exiting the KIF Reservation by way of Swan Pond Road would travel west on US 70 to Pine Ridge Road and then to Interstate Highway (I-) 40 or State Route (SR) 27. Therefore, Swan Pond Road, US 70, and Pine Ridge Road are the common routes considered and identified as such in Table 3-1. Figure 3-1 illustrates the common routes.

Four landfill locations are potential sites in Tennessee for waste debris removal placement: Anderson County, Knox County, Murfreesboro, and Athens. If used, the Anderson County location would be accessed by I-40 East to I-640 East/I-75 North to Exit 117 (SR 170) and right on Fleenor Mill Road. This route is approximately 50 miles in length (one way) and most of the route is interstate highway. The Knox County Landfill would be accessed by I-40 East to I-40 East/I-75 North to Exit 373 (North Campbell Station Road) to right on Yarnell Road. This route is approximately 30 miles (one way). The Murfreesboro Landfill would be accessed by I-40 West to Exit 238 (US 231/SR 10 [Murfreesboro Rd]) toward Murfreesboro to SR 266 (East Jefferson Pike). This route is approximately 133 miles (one way). The Athens Landfill would be accessed by I-40 East to I-75 South to Exit 49 (SR 30). This route is approximately 58 miles (one way). Figures 3-2 through 3-5 depict the four proposed routes.

Table 3-1. Annual Average Daily Traffic From 2008 With Projected Data and Level of Service Data From the Analyses

Landfill	Route	Terrain	Traffic Data 2009 AADT	Projected 2011 Traffic	LOS	Traffic 2011 With Increase	LOS	Comments
Common	Swan Pond Road	Level	3,223	3,449	A	3,469	A	Common access road from plant
	US 70	Level	12,670	13,653	B	13,673	B	Common access
	Pine Ridge Road	Rolling	9,300	9,951	B	9,971	B	Access road common to I-40 or US 27
Knox	North Campbell Station	Rolling	3,759	4,022	B	4,042	B	
	Yarnell	Rolling	2,320	2,482	A	2,502	A	
Anderson	SR 170	Rolling	4,874	5,215	D	5,235	D	
	Fleenor Mill	Rolling	No data					
Murfreesboro	SR 10	Rolling	10,481	11,215	D	11,235	D	
	SR 10	Level	6,022	6,444	C	6,464	C	
	SR 10	Level	4,553	4,872	B	4,892	B	
	SR 10	Level	9,059	9,693	D	9,713	D	
	SR 266	Level	7,472	7,995	D	8,015	D	
Athens	SR 30	Rolling	9,420	10,079	A	10,099	A	
	CR 166	Rolling	No data					

AADT = Average annual daily traffic
LOS = Level of service

Figure 3-1. Kingston Fossil Plant Common Routes

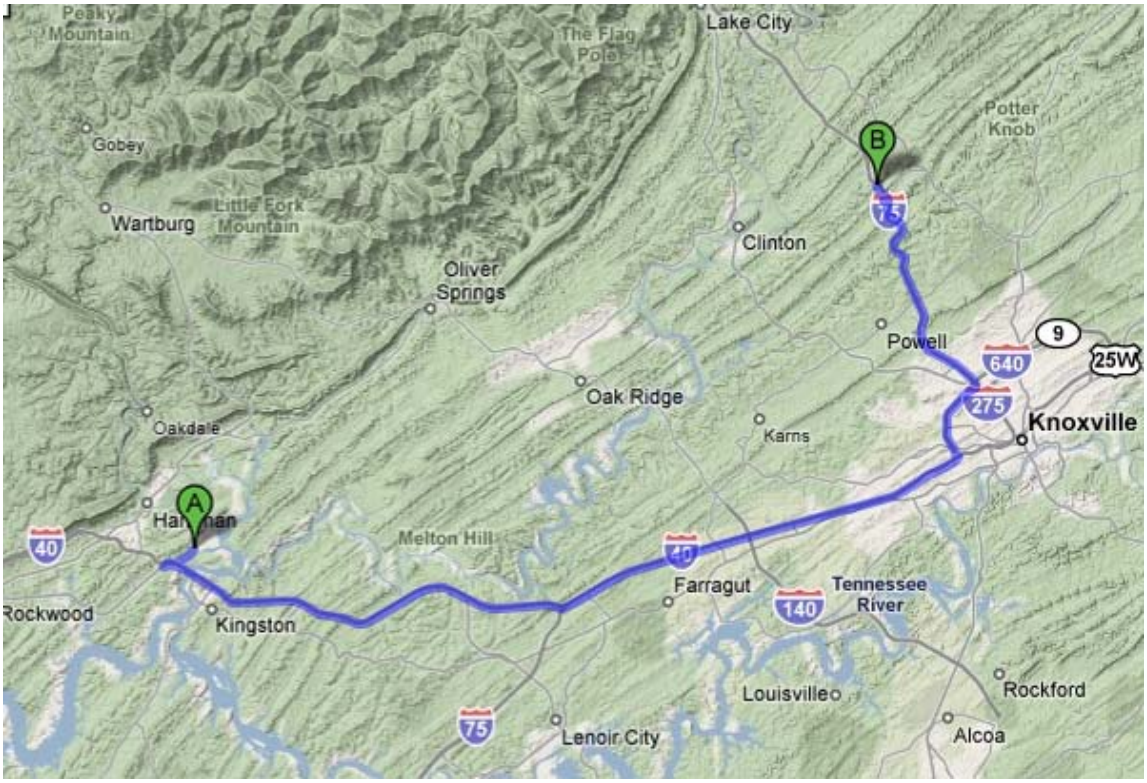

Figure 3-2. Area Map (Kingston to Anderson County Landfill)

Figure 3-3. Area Map (Kingston to Knox County Landfill)

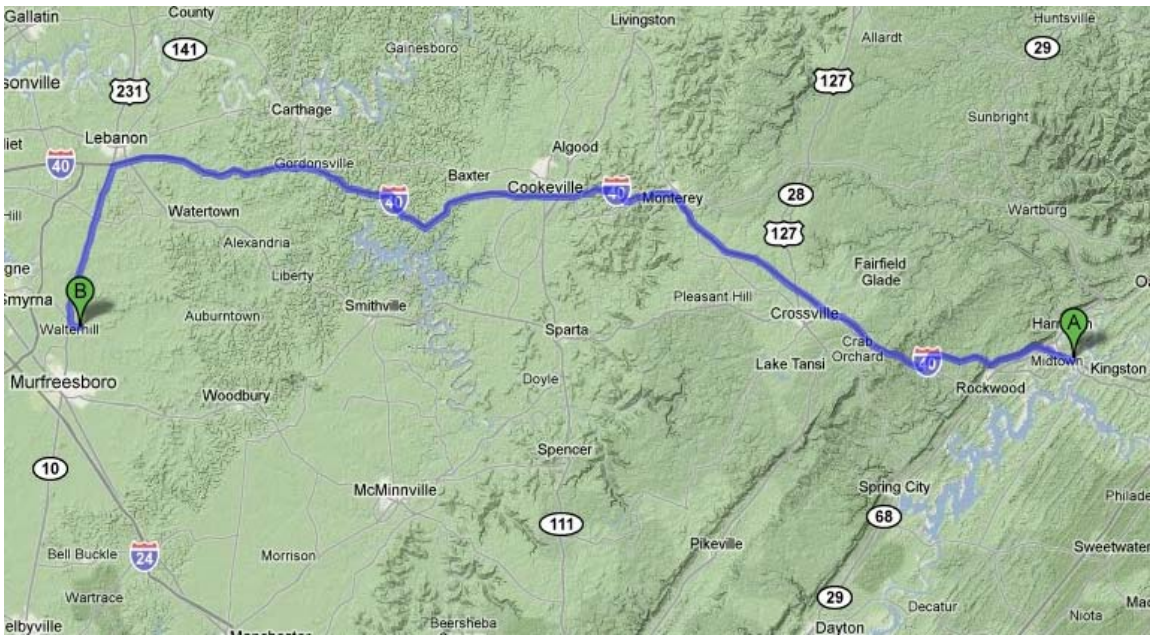

Figure 3-4. Area Map (Kingston to Murfreesboro Landfill)

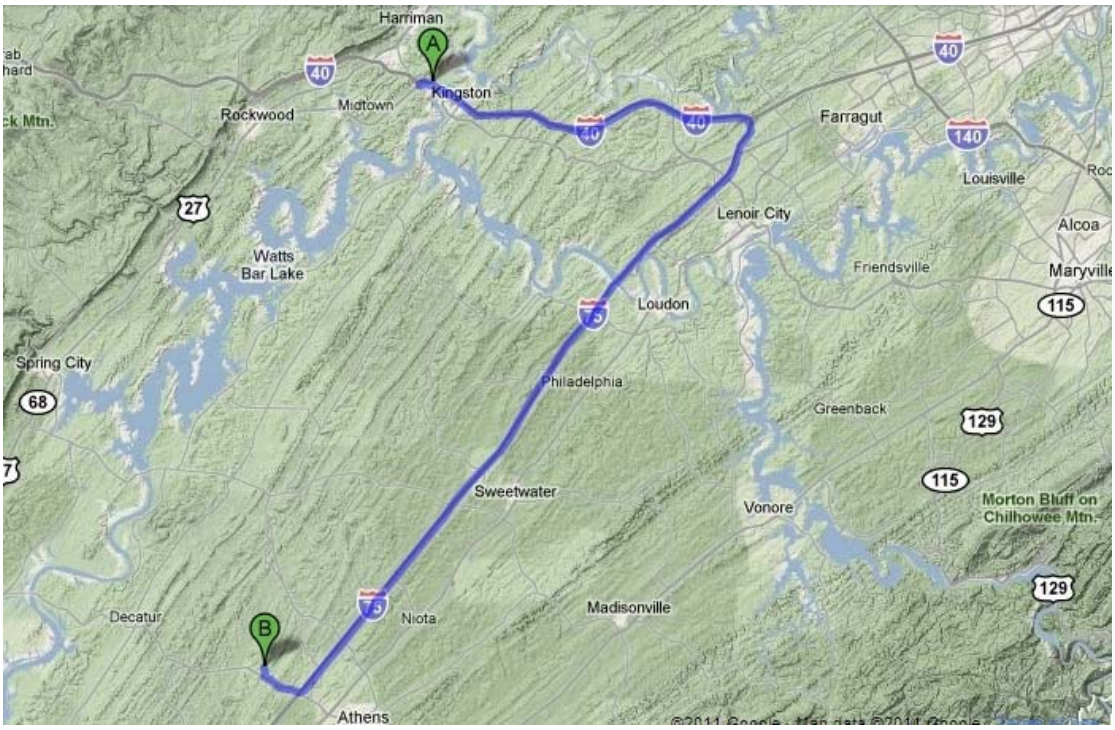

Figure 3-5. Area Map (Kingston to Athens Landfill)

3.2.2. Environmental Consequences

3.2.2.1. No Action Alternative

Under the No Action Alternative, TVA does not anticipate the disposing of debris waste material to an off-site landfill. Therefore, if debris waste material were not hauled to an off-site location, no transportation impacts would occur.

3.2.2.2. Proposed Action Alternative

This analysis evaluates the impacts of transporting debris waste material by trucks on the proposed transportation networks. For this analysis, it is estimated that 36,000 cubic yards of debris waste material would be hauled off from the site over a minimum six-month span. Hauling the material could continue for up to a year if more structures are demolished or the estimated material takes longer to demolish and haul off than what is projected. Each truck is assumed able to haul 20 cubic yards of material. Based on 120 workdays (hauling Monday through Friday), approximately 20 truck trips per day would be generated for hauling.

Hauling the debris waste material to locations off site of KIF, as stated above, would result in additional highway traffic. The Transportation Research Board (2000) outlines methods for evaluating the operational conditions within a traffic stream. These methods take into account average highway speed, lane widths, shoulder widths, and alignment among other inputs. These methods define six levels of service (LOS), using the letters A through F:

- LOS A is defined as the highest quality of service that a particular class of highway can provide. It is a condition of free flow in which little or no restriction on speed or maneuverability is caused by the presence of other vehicles.

- LOS B is a zone of stable flow. The restriction on maneuverability is negligible, and there is little probability of major reduction in speed or flow.
- LOS C is a zone of stable flow, but at this volume and density level, most drivers are becoming restricted in their freedom to select speed, change lanes, or pass.
- LOS D approaches unstable flow. Tolerable average operating speeds are maintained, but could be subject to considerable and sudden variation. This condition is tolerable for short periods.
- LOS E is unstable with lower operating speeds and some momentary stoppages. There is little independence of speed selection and maneuverability. The upper limit of this level is the capacity of the facility.
- LOS F indicates forced-flow operations at low speeds. The level of density increases to the effect of a traffic jam.

Table 3-1 contains the average annual daily traffic (AADT) from 2010 with projected data and LOS data from the analyses, based on 20 truck trips for the days spoil material would be hauled from KIF (TDOT 2009). The projected values for 2011 include a 7 percent annual increase in AADT from 2009, plus additional traffic due to hauling the debris waste material. The analyses assume that 100 percent of the additional traffic would use Swan Pond Road, US 70, and Pine Ridge Road to reach I-40 and the final destinations.

All proposed routes have varying LOS (A through D) with no decreases in the LOS identified. According to the Transportation Research Board (2000), most design or planning efforts typically maintain service rates at LOS C or D to ensure an acceptable operating service for facility users that minimizes the inconveniences resulting from traffic delays.

It should be noted that the trips created from truck hauling are relatively small compared to the total increase in the projected AADT. In most cases, the truck trips account for less than 0.5 percent of the increase for all the proposed routes. The 7 percent annual increase to the AADT should be considered the major driver in the LOS change. A more detailed look at prior AADT counts for most of the proposed routes would show that a 7 percent increase is not occurring, with some routes actually having decreases. Therefore, the estimated truck trips should not have a significant impact on these transportation networks.

Although the impacts of trucks transporting debris waste material would be minor on the transportation network, TVA's request for proposals would require potential bidders to consider reducing the potential impact of KIF trucking activities upon the environment. Contractor shall take into account such factors as air pollution, erosion control, noise control, solid waste disposal, and wastewater disposal, among other things. The contract would require that truck owners properly maintain trucks, including tune-ups. Truck routes would avoid schools, historic districts, and downtown areas to the extent possible. Additional requirements such as use of ultra-low sulfur diesel fuel and minimizing idling time would also be required.

In addition to the LOS analyses, an analysis of accidents was performed using information taken from a United States Department of Transportation (USDOT), Federal Motor Carrier Safety Administration (FMCSA) report (USDOT 2010). The data used are for large trucks, which are classified as vehicles weighing more than 10,000 tons. Based on the information

provided in this 2008 report, the projected truck traffic and landfill location, the data in Table 3-2 were obtained.

Table 3-2. Truck Hauling Fatality and Injury Data

Landfill Location	No. of Truck Trips per One Fatality	No. of Years for One Fatality	Injuries/Year
Anderson	671,141	168	0.4
Knox	1,118,568	279	0.2
Murfreesboro	252,309	63	1.1
Athens	559,284	140	0.5

To quantify the potential cumulative impacts, the number of truck trips needed to reach 100 million vehicle-miles was calculated to compare to the data provided in the USDOT/FMCSA report. Based on this analysis, it is extremely unlikely that there would be any fatalities. It is possible, however, that accidents would occur that cause injuries. Based on distance from KIF, the Anderson County and Knox County landfills are the least likely routes to suffer from accidents, while the Athens and Murfreesboro landfill routes are more likely to generate accidents if debris waste material were hauled to these locations by trucks.

3.3. Air Resources

3.3.1. Affected Environment

Air quality is a valuable environmental resource. Through its passage of the Clean Air Act, Congress has mandated the protection and enhancement of our nation's air quality resources. National Ambient Air Quality Standards (NAAQS) for the following criteria pollutants have been set to protect the public health and welfare:

- sulfur dioxide (SO_2)
- ozone (O_3)
- nitrogen dioxide (NO_2)
- particulate matter (PM) whose particles are $\leq$ 10 micrometers (PM_{10})
- particulate matter whose particles are $\leq$ 2.5 micrometers ($PM_{2.5}$)
- carbon monoxide (CO)
- lead (Pb)

The primary NAAQS were promulgated to protect the public health, and the secondary NAAQS were promulgated to protect the public welfare from any known or anticipated adverse effects associated with the presence of pollutants in the ambient air. Areas in violation of the NAAQS are designated as nonattainment areas, and new sources to be located in or near these areas may be subject to more stringent air permitting requirements. A listing of the NAAQS is presented in Table 3-3. National standards, other than annual standards, are not to be exceeded more than once per year (except where noted).

The air quality in the vicinity of the Kingston plant site is generally good. Table 3-4 shows the results of ambient air quality monitoring of criteria pollutants that are considered representative of the site. USEPA has designated Roane County as partial county nonattainment for $PM_{2.5}$. Nearby Anderson, Knox, and Loudon counties are all nonattainment for $PM_{2.5}$. Roane County is currently in attainment for all other criteria pollutants.

Table 3-3. National Ambient Air Quality Standards

Pollutant	Primary Standards[a]		Secondary Standards[b]	
	Level	Averaging Time	Level	Averaging Time
Carbon Monoxide (CO)	9 ppm (10 mg/m^3)	8-hour (1)	None	
	35 ppm (40 mg/m^3)	1-hour (1)		
Lead (Pb)	0.15 µg/m^3 (2)	Rolling 3-Month Average	Same as Primary	
	1.5 µg/m^3	Quarterly Average	Same as Primary	
Nitrogen Dioxide (NO_2)	53 ppb (3)	Annual (Arithmetic Average)	Same as Primary	
	100 ppb	1-hour (4)	None	
Particulate Matter (PM_{10})	150 µg/m^3	24-hour (5)	Same as Primary	
Particulate Matter ($PM_{2.5}$)	15.0 µg/m^3	Annual (6) (Arithmetic Average)	Same as Primary	
	35 µg/m^3	24-hour (7)	Same as Primary	
Ozone (O_3)	0.075 ppm (2008 standard)	8-hour (8)	Same as Primary	
	0.08 ppm (1997 standard)	8-hour (9)	Same as Primary	
	0.12 ppm	1-hour (10)	Same as Primary	
Sulfur Dioxide (SO_2)	0.03 ppm	Annual (Arithmetic Average)	0.5 ppm	3-hour (1)
	0.14 ppm	24-hour (1)		
	75 ppb (11)	1-hour	None	

Source: USEPA NAAQS http://www.epa.gov/air/criteria.html
Abbreviations: ppm = parts per million, ppb = parts per billion, mg/m^3 = milligrams per cubic meter, µg/m^3 = micrograms per cubic meter
Notes:
(a) Standards set to protect public health
(b) Standards set to protect public welfare
(1) Not to be exceeded more than once per year
(2) Final rule signed October 15, 2008
(3) The official level of the annual NO_2 standard is 0.053 ppm, equal to 53 ppb, which is shown here for the purpose of clearer comparison to the 1-hour standard
(4) To attain this standard, the three-year average of the 98th percentile of the daily maximum 1-hour average at each monitor within an area must not exceed 100 ppb (effective January 22, 2010)
(5) Not to be exceeded more than once per year on average over three years
(6) To attain this standard, the three-year average of the weighted annual mean $PM_{2.5}$ concentrations from single or multiple community-oriented monitors must not exceed 15.0 µg/m^3
(7) To attain this standard, the three-year average of the 98th percentile of 24-hour concentrations at each population-oriented monitor within an area must not exceed 35 µg/m^3 (effective December 17, 2006)
(8) To attain this standard, the three-year average of the fourth-highest daily maximum 8-hour average ozone concentrations measured at each monitor within an area over each year must not exceed 0.075 ppm (effective May 27, 2008)
(9) (a) To attain this standard, the three-year average of the fourth-highest daily maximum 8-hour average ozone concentrations measured at each monitor within an area over each year must not exceed 0.08 ppm.
(b) The 1997 standard—and the implementation rules for that standard—will remain in place for implementation purposes as USEPA undertakes rulemaking to address the transition from the 1997 ozone standard to the 2008 ozone standard
(c) USEPA is in the process of reconsidering these standards (set in March 2008)
(10) (a) USEPA revoked the 1-hour ozone standard in all areas, although some areas have continuing obligations under that standard ("anti-backsliding").
(b) The standard is attained when the expected number of days per calendar year with maximum hourly average concentrations above 0.12 ppm is $\leq$1
(11) (a) Final rule signed June 2, 2010; to attain this standard, the three-year average of the 99th percentile of the daily maximum 1-hour average at each monitor within an area must not exceed 75 ppb

Table 3-4. Ambient Concentrations of Criteria Air Pollutants Compared With Air Quality Standards

Pollutant	Level of Standard (ppm)[a]	One-Year Maximum or Mean	
		Concentration (ppm)[a]	Percent of Standard (%)
Ozone (2008 Standard)	4th Highest 8-hour average (0.075)	0.073[c]	97
Sulfur Dioxide	Maximum 3-hour average (0.5) Maximum 24-hour average (0.14) Annual mean (0.030)	0.094[b] 0.025[b] 0.002[b]	19 18 6
Nitrogen Dioxide	Annual mean (0.053)	0.007[d]	13
Carbon Monoxide	Maximum 1-hour average (35) Maximum 8-hour average (9)	0.9[e] 0.5[e]	3 6
PM_{10} (Old Standard)[g] $PM_{2.5}$ (New Standard)	($\mu g/m^3$) Maximum 24-hour average (150) Annual average (15) 24-hour average (35)	($\mu g/m^3$) 47[d] 13.7[f] 30.3[f]	 31 91 87
Lead	($\mu g/m^3$) Quarterly mean (1.5)	($\mu g/m^3$) 0.[c]	

Abbreviations: ppm = parts per million, $\mu g/m^3$ = micrograms per cubic meter
Notes:
a - ppm unless otherwise noted
b - Sulfur dioxide values for Bull Run, Anderson County, Tennessee, 2006
c - Ozone values for Oak Ridge, Anderson County, Tennessee, 2008
d - Nitrogen dioxide values for Meigs County, Tennessee, 2006
e - Carbon monoxide values for Look Rock, Blount County, Tennessee, 2007
f - $PM_{2.5}$ values for Harriman, Roane County, Tennessee, 2008
g - PM_{10} values for Rockwood, Roane County, Tennessee, 2008

All areas in Tennessee had met attainment of the old 1-hour ozone standard. However, for some areas, attainment of an 8-hour ozone standard of 80 parts per billion (ppb) has been more difficult to achieve. Subsequently on March 27, 2008, USEPA revised the primary and secondary NAAQS for ozone (40 CFR Part 50 [USEPA 2008]). The level of the 8-hour primary standard was revised to 75 ppb, and the secondary standard was revised to be identical to the revised primary standard. Due to a judicial ruling, the March 27, 2008, revision to the NAAQS for ozone is currently being reviewed, and attainment designations based on the 75 ppb standard have not been made. USEPA has stated that the NAAQS for ozone will be finalized in July 2011.

3.3.2. Environmental Consequences

3.3.2.1. No Action Alternative

Under the No Action Alternative, TVA would not demolish the structures. Environmental conditions in the project area would not change, and anticipated health and safety benefits would not occur in the region. Adoption of this alternative would not meet TVA's objectives.

3.3.2.2. Proposed Action Alternative

The razing of houses and structures would have associated transient air pollutant emissions. In addition to fugitive dust emissions from the demolition of structures, there would be some fugitive emissions associated with the hauling of debris using trucks driven

over paved and unpaved surfaces. In addition, there would be pollutant emissions from the exhaust of internal combustion engines powering the machinery used for demolition and hauling of debris.

Fugitive emissions from demolition activities would produce particles that would be deposited primarily on the property where the structures being demolished are located. Ninety-five percent (by weight) of fugitive emissions from vehicular traffic over paved roads would be comprised mainly of particles that would be deposited near the roadways. The remaining fraction of the dust would be subject to transport beyond the property boundaries or roadway rights-of-way. A large fraction of fugitive emissions from vehicle traffic in unpaved areas would be deposited near the unpaved areas. If necessary, emissions from open demolition areas, paved, and unpaved roads would be mitigated using wet suppression. Wet suppression can reduce fugitive dust emissions by as much as 95 percent from roadways and unpaved areas.

ACM, which are present in some of the buildings being considered for razing, would be removed and properly disposed of prior to the razing of the structures. All asbestos removal would be done by certified asbestos contractors, in accordance with OSHA asbestos regulations (Standards-29 CFR 1926.1101). All parts of NESHAP, 40 CFR Part 61 Subpart M – National Emission Standard for Asbestos will be followed during any abatement activities. Procedures for mitigating the release of asbestos fiber include the use of curtains, shrouds, wet suppression, high-efficiency particulate air filters and transport of asbestos in sealed containers. The transfer of asbestos for ultimate disposal will be done in accordance with USDOT regulation 49 CFR Parts 171-173. By adhering to asbestos removal regulations, there will be practically no fugitive emissions from asbestos removal activities.

Combustion of gasoline and diesel fuels by internal combustion engines (haul trucks and off-road vehicles) would generate local emissions of PM, nitrogen oxides, CO, volatile organic compounds, and SO_2. The total amount of these emissions would be small and would result in minimal off-site impacts.

Air quality impacts from demolitions and debris hauling activities would be temporary and dependent on both man-made factors (e.g., intensity of activity, control measures, etc.) and natural factors (e.g., wind speed, wind direction, soil moisture, etc.). However, even under unusually adverse conditions, these emissions would have, at most, a minor, transient impact on off-site air quality and would be well below the applicable ambient air quality standard. Overall, the air quality impact of construction-related activities for the project would not be significant.

3.4. Socioeconomics and Environmental Justice

3.4.1. Affected Environment

The Kingston ash spill occurred in Census Tract (CT) 307 in Roane County, Tennessee, with impacts to property also in CT 309 to the east across the Emory River. The property impacts were largely confined to Block Groups (BGs) 1 and 2 in CT 307 and BGs 1 and 4 in Census Tract 309. As of the 2000 United States Census of Population, the population of CT 307 was 4,578, of which 2,050 lived in BGs 1 and 2. The 2000 population of CT 309 was 6,106, of which 1,842 lived in BGs 1 and 4 (United States Census Bureau 2000).

Total employment in Roane County in 2008 was 22,731 (United States Department of Commerce 2010). In 2008, slightly more than 23 percent of total jobs were in professional, scientific, and technical services. This sector provided about 5 percent of jobs in the state and almost 7 percent nationally. Roane County also had higher shares of local, state, and federal government employment than did the state and the nation. In almost all other sectors, Roane County shares were lower than state and national shares.

Per capita personal income in Roane County in 2008 was $32,260, about 80 percent of the national average of $40,166. Statewide, per capita personal income was $34,833, almost 87 percent of the national level (ibid).

Minority population shares ranged from 1.4 percent in CT 307, BG 1 to 7.2 percent in CT 309, BG 1. BG 1 in CT 309 is the only CT with a minority population share greater than the county share of 5.2 and the state and national shares of 20.8 and 30.9 percent, respectively (United States Census Bureau 2000).

The poverty level in Roane County, as of the 2000 Census of Population, was 13.9 percent, slightly higher than the state average of 13.5 and the national average of 12.4 percent. Poverty levels in the BGs ranged from 4.7 to 20.0, with two BGs above and two below the national level (ibid).

3.4.2. Environmental Consequences

3.4.2.1. No Action Alternative

Under the No Action Alternative, TVA would not demolish the structures. Therefore, there would be no direct change in the environmental condition of the area. However, the houses would continue to deteriorate. This alternative could have increasingly negative impacts on the health and safety of residents of, or visitors to, the general area. Aesthetics of the area would not be improved; instead, there likely would be continuing decline. Property values in the surrounding area likely would be negatively impacted, especially for houses nearby or with a view of the area. Any such impacts on property values would increase over time as the houses continue to deteriorate.

As discussed in Section 3.4.1, minority population shares vary within the impact area, but overall are generally lower than those in Roane County as a whole, and are much lower than the state and national levels. Poverty levels also vary within the impact area, but overall are similar to those in Roane County as a whole, the state, and the nation. No impacts that would disproportionately affect either minority or low-income populations have been identified.

3.4.2.2. Proposed Action Alternative

Under the Action Alternative, TVA would convert property in the immediate vicinity of the ash spill from residential to TVA power property. TVA purchased these properties as part of the spill recovery operations. TVA plans to retain some of these properties as permanent extensions to the existing plant boundary and has been and is continuing to evaluate potential uses for these sites.

The proposed action would avoid or restore losses in property values due to the ash spill and maintain or enhance aesthetic benefits to those in view of the site. Increases in property values for residences with a view of the site might occur, depending on how the view after restoration compares to the original view. There is potential for minor impacts

during demolition and restoration, such as noise or traffic. However, these would be temporary and intermittent. No significant negative impacts to property values have been identified.

Any negative impacts of the demolition process on environmental justice would be temporary and intermittent. Due to the wide distribution of minority and low-income populations, as well as the potential benefits, no disproportionate impacts or cumulative impacts to disadvantaged populations are likely.

3.5. Visual Resources

3.5.1. Affected Environment

The physical, biological, and cultural features of an area combine to make the visual landscape character both identifiable and unique. Scenic integrity indicates the degree of unity or wholeness of the visual character. Scenic attractiveness is the evaluation of outstanding or unique natural features, scenic variety, seasonal change, and strategic location. Where and how the landscape is viewed affect the more subjective perceptions of its aesthetic quality and sense of place. Views of a landscape are described in terms of what is seen in foreground, middleground, and background distances. In the foreground, an area within 0.5 mile of the observer, details of objects are easily distinguished in the landscape. In the middleground, normally between 1-4 miles from the observer, objects may be distinguishable but their details are weak and they tend to merge into larger patterns. Details and colors of objects in the background, the distant part of the landscape, are not normally discernible unless they are especially large and standing alone. The impressions of an area's visual character can have a significant influence on how it is appreciated, protected, and used. The general landscape character of the study area is described in this section with additional details in Section 3.5.2.

The proposed project area is located in the vicinity of the KIF ash spill and ash recovery operation areas. Views of the project area would likely be up to distances in the foreground (0 feet to 0.5 mile) from local roads and other nearby residential areas. Scenic attractiveness of the proposed project area is common, and scenic integrity is low due to land disturbance as a result of residential development.

3.5.2. Environmental Consequences

Visual consequences are examined in terms of visual changes between the existing landscape and proposed actions, sensitivity of viewing points available to the general public, their viewing distances, and visibility of proposed changes. Scenic integrity indicates the degree of intactness or wholeness of the landscape character. These measures help identify changes in visual character based on commonly held perceptions of landscape beauty and the aesthetic sense of place. The foreground, middleground, and background viewing distances were previously described in Section 3.5.1.

3.5.2.1. No Action Alternative

Under the No Action Alternative, TVA would not demolish the structures. The structures would likely deteriorate over time due to lack of maintenance. This would result in cumulative, negative visual impacts and would adversely affect the residential viewshed as seen from local roads and nearby residential developments.

3.5.2.2. Proposed Action Alternative

Under the Action Alternative, there would be a beneficial visual change in the landscape as a result of the proposed demolition activities. Existing houses and associated structures would be removed and the existing landscape would be restored to preconstruction conditions. Existing vegetative buffers would be preserved along the shorelines, and vegetation would be replanted with native or nonnative, noninvasive species. Scenic attractiveness and integrity would be restored, creating a naturally appearing landscape.

Operation, construction, and postconstruction maintenance activities of the proposed demolition area would be visually beneficial. There may be some minor visual discord during the construction period due to an increase in personnel and equipment and the use of laydown and materials storage areas. These visual obtrusions would be temporary until areas have been restored to preconstruction conditions through the use of TVA standard BMPs (Muncy 1999). Therefore, there are no significant visual impacts anticipated as a result of this project.

3.6. Water Resources Including Surface Water and Groundwater

3.6.1. Affected Environment

Surface Water

TVA has purchased properties in the vicinity of the KIF ash spill and ash recovery operation areas as part of its continuing efforts to address the impacts of the spill and cleanup. This property, including 180 parcels of land totaling over 900 acres of previously private property, is located in eastern Tennessee along two ridgelines (which run northeast-southwest). Pine Ridge is located to the west of KIF, and Dickey Ridge is located to the east. The layouts of these properties have three distinct drainage areas. The properties located southeast of KIF, Swan Pond southwest (Figure 1-2), drain to King Creek and the Clinch River; the properties northwest of KIF (Figures 1-3 and 1-4) drain to the Swan Pond embayment and/or to an unnamed embayment and eventually empty into the Emory River; and the properties located along the northeast and northwest banks of the Emory embayment (Figure 1-5) drain to the Emory River. All drainage areas are located in the upper portion of Watts Bar Reservoir. Watts Bar Dam is approximately 40 river miles below the beginning of the purchased property (37.9 miles on the Tennessee River and 2.0 miles on the Clinch River) at Tennessee River Mile 529.9 and ranges approximately 5.5 river miles upstream to 3.5 miles on the Emory River.

River flow rates past the properties are regulated by upstream dams on the Clinch River (Melton Hill and Norris dams) and downstream on the Tennessee River by Watts Bar Dam. The flow rates are also influenced by upstream dam operations on the Tennessee River (Tellico and Fort Loudoun dams). Flow patterns can be complex in the Emory and Clinch rivers embayments. The Emory River flow fluctuates between flowing upstream from the Clinch River through the Emory River embayment to also flowing backward upstream of KIF. Water is pushed up the Emory River because of inflows that raise the pool elevation in Watts Bar Reservoir. Such inflow typically occurs when the reservoir is filling in the spring or during a spring flood event. Different rates and timing of releases from Watts Bar, Fort Loudoun, and Melton Hill reservoirs can also cause reverse flows in the Clinch River arm of Watts Bar Reservoir. There is the potential for water from the Clinch River to flow upstream on the Tennessee River during the filling of Watts Bar Reservoir.

These flow patterns are further complicated by temperature and density differences in the water. Warmer water is less dense and therefore stays on the surface of a reservoir. In the

summer, the sun and air temperatures warm the surface water, and this thermal layering becomes stable and does not mix with deeper, cooler, and denser water. This stable thermal layering of water is known as stratification. The Emory River water also warms during summer. Norris Dam and Melton Hill Dam discharges keep the Clinch River relatively cool despite increased air temperatures in the summer. When Clinch River water flows upstream into the Emory River embayment to the KIF intakes in the summer, this cooler water flows along the bottom of the embayment, and the warmer Emory River water can flow downstream over the top of the cooler Clinch River water.

Water Quality (Pre-December 2008)

The *Emergency Dredging for Kingston Fossil Plant Ash Dike Failure Final Environmental Assessment* (TVA 2009b) describes the water quality prior to the December 2008 dike failure. The Emory River arm of Watts Bar Reservoir is on the state 303(d) list of impaired waters (TDEC 2008) because of sediments contaminated with PCBs and chlordane from industrial point sources. The section of the Emory above the influence of the Watts Bar impoundment is listed as impaired due to mercury from long-range atmospheric deposition (settling in the water from airborne sources). Several tributaries of the Emory River upstream of KIF are also listed as impaired because of manganese and iron concentrations and low pH; these conditions have most likely occurred from historic coal mining activities. A few of these upstream tributaries are also impacted by sediment, by other causes such as development, or by pathogens from agriculture.

TVA conducted the Vital Signs Monitoring Program (VSMP) on Watts Bar Reservoir annually from 1991 through 1994 to establish baseline data on the reservoir's ecological health under a range of weather and flow conditions. Since 1994, Watts Bar Reservoir has been evaluated every other year. The VSMP uses five metrics to evaluate the ecological health of TVA reservoirs: chlorophyll concentration, fish community health, bottom life, sediment contamination, and dissolved oxygen. Values of good, fair, or poor are assigned to each metric TVA monitored.

The overall ecological health condition for Watts Bar Reservoir rated fair in 2008. The reservoir ratings for Watts Bar have fluctuated between a "high fair" and "poor," and have generally followed reservoir flow conditions with the lowest ratings during droughts. Of the indicators included in the VSMP, dissolved oxygen is the most responsive to flow rates.

Water Quality (Post-December 2008)

The December 2008 KIF dike failure released about 5.4 million cubic yards of coal ash and about 327 million gallons of water. This ash and water spread over nearly 300 acres of land and water adjacent to the plant and into the Emory River. USEPA, TDEC, and TVA crews have been sampling water to assess the quality of public drinking water supplies, private wells, in-stream river water (both near the slide and at multiple downstream locations), and local springs.

In general, the levels of contaminants in water increase as flow increases and levels of contaminants decrease as flow recedes. Higher flow rates and high water velocities cause small particles of solid materials to become suspended in the water column and therefore increase concentration. The chemical constituents of greatest concern are the metals contained in the ash. These trace constituents are chemically combined with the ash. Depending on the temperature, pH, and oxygen availability in the water, the metals may disassociate from the ash. As shown on the Web site http://www.tva.com/kingston/index.htm, the maximum levels of arsenic, mercury, and

selenium from all standard sampling locations on the Emory, Clinch, and Tennessee rivers have been below both the Tennessee Fish and Aquatic Life Criterions for Continuous Concentration and the Tennessee Domestic Water Supply Criterions.

The proposed project's surface waters flow into the Swan Pond Embayment, an unnamed embayment, and eventually into the Emory River. According to the lastest version of the *Kingston Ash Recovery Project Non-Time-Critical Removal Action Surface Water Monitoring Plan for the Emory, Clinch, and Tennessee Rivers* (Jacobs 2009), periodic samples were collected in the direct vicinity of these surface waters.

The most relevant sample locations in relation to the proposed project site appear to be the Swan Pond Embayment, various locations in the Emory River at Emory River Miles (ERMs) 0.1, 1.75 and 2.1, and the Emory River dredging operation (dredge plum). Samples were analyzed for several constituents of concern, including arsenic, mercury, selenium, and thallium, which were of particular interest due to media and regulator focus after the spill, their chemical composition, and their ability to bioaccumulate in plant and animal tissue.

According to the monitoring plan, samples collected from September 2009 until June 2010 from the Swan Pond embayment had one or more concentrations of arsenic, mercury, selenium, or thallium that exceeded one of the three TDEC Tennessee water quality criteria. Various Emory River locations ranging from ERM 0.1 to 2.1 detected arsenic, lead and thallium concentrations that exceeded these criteria. Dredge plume samples collected from the most turbid parts of visual dredge plumes during the Emory River dredging operations had one or more concentrations of these constituents that exceeded one of the criteria as well.

Samples from the comparison of the maximum and average concentrations for dredge plume and Emory River at ERM 0.1 samples indicate that even during dredging activities, ash-related constituents settled out of the water column quickly. Additionally, the local drinking supply and groundwater wells are all frequently tested, and all samples have continuously met public health standards.

To ensure that runoff waters from the surrounding drainage basin were not contaminated as soon as they entered the embayments, an interim drainage system (the Clean Water Ditch) was constructed in mid-2009 to intercept clean runon water and divert it around the ash, discharging to the Swan Pond embayment and Emory River. A similar drainage system (the Dirty Water Ditch) was constructed to collect water that runs through the ash-filled embayment and send it through a series of surface water sediment basins to allow the solids to settle out before discharging to the Clean Water Ditch.

Water from an adjacent ash-filled area, the East Embayment, also was collected and allowed to settle before discharging to the Clean Water Ditch and Emory River. Ash removal from this smaller embayment was completed in spring 2010 as part of the time-critical phase; water from this embayment now flows directly into the Swan Pond embayment and Emory River as it did before the spill.

Currently, the Clinch and Emory River arms of Watts Bar Reservoir are listed on the state 303(d) list (TDEC 2010). The Clinch River arm is listed because of PCBs, mercury, and chlordane contamination of the sediment from legacy (historical) pollutants, industrial point source discharges, and from atmospheric deposition. Nearby tributaries to the Clinch River are also listed for PCBs, chlordane, and mercury; one nearby tributary is listed for arsenic.

The Emory River arm is also listed on the state 303(d) list (TDEC 2010) because of PCBs, mercury, and chlordane contamination of the sediment from legacy (historical) pollutants, industrial point source discharges, and from atmospheric deposition. Additionally, the Emory River arm, including Swan Pond Creek embayment and the unnamed embayment, is listed because of ash spill-related contamination including arsenic and coal ash deposits.

Groundwater

The project area is located in the Valley and Ridge Physiographic Province and is underlain by Cambrian-aged rocks of the Conasauga Group and Ordovician-aged rocks of the Knox group. The Valley and Ridge aquifer consists of folded and faulted carbonate, sandstone, and shale. Soluble carbonate rocks and some easily eroded shales underlie the valleys in the province, and more erosion-resistant siltstone, sandstone, and cherty dolomite underlie ridges. The arrangement of the northeast-trending valleys and ridges are the result of a combination of folding, thrust faulting, and erosion. Compressive forces from the southeast have caused these rocks to yield, first by folding and subsequently by repeatedly breaking along a series of thrust faults. The result of the faulting is that geologic formations are repeated several times across the region. Carbonate-rock aquifers in the Chickamauga, Knox, and Conasauga groups are repeated throughout the Valley and Ridge Physiographic Province (Lloyd and Lyke 1995).

Groundwater movement in the Valley and Ridge Province is localized, restricted by the repeating lithology created by thrust faulting. Older rocks, primarily the Conasauga Group and the Rome Formation have been displaced upward over the top of younger rocks (the Chickamauga and the Knox groups) along thrust fault planes thus forming a repeating sequence of permeable and less permeable hydrogeologic units. The repeating sequence, coupled with the stream network, divides the area into a series of adjacent, isolated, shallow groundwater flow systems. The water moves from the ridges where the water levels are high, toward lower water levels adjacent to major streams that flow parallel to the long axes of the valleys. Most of the groundwater is discharged directly to local springs or streams (Lloyd and Lyke 1995).

The chemical quality of water in the freshwater parts of the Valley and Ridge aquifers is similar for shallow wells and springs. The water is hard, is a calcium-magnesium-bicarbonate type, and typically has a dissolved-solids concentration of 170 milligrams per liter or less. In places where the residuum that overlies the carbonate rocks is thin, the Valley and Ridge aquifers are susceptible to contamination by human activities (United States Geological Survey and TDEC 1995).

There are four residential groundwater wells located on the proposed demolition properties. Seven residential wells occur on properties immediately adjacent to the project properties. Public drinking water for Roane County is supplied by surface water sources (USEPA 2010). All public groundwater sources in Roane County have been closed prior to October 2008, except for one, and it is located approximately 10 miles east of the project area. The northern section of the project area, Swan Pond Circle, is located within a State Designated Wellhead Protection Area.

3.6.2. Environmental Consequences

3.6.2.1. No Action Alternative

Under the No Action Alternative, TVA would not demolish the structures. Environmental conditions in the project area would not change; however, surface water and groundwater

could still potentially be impacted if the structures were not properly maintained or allowed to slowly disintegrate.

3.6.2.2. Proposed Action Alternative

Because the proposed project deals with demolition activities of mostly residential lands, constituents naturally occurring in the soil and in the solid waste produced by demolition activities and sediment are thought to be the potential pollutants to surface water and groundwater for this project. The previous surface water quality sections information is intended to provide background of the water resources in the vicinity of the project area before and after the KIF ash spill. This project is not expected to include any ash handling or removal. Additionally, this project is not expected to increase any pollutant contamination currently listed on the 303(d) list for this area.

Under the Action Alternative, TVA would convert property impacted by the TVA ash spill in the immediate vicinity of KIF by changing residential areas to TVA power property. This conversion would include the following commitments:

- Demolition and removal of all structures and infrastructure on the property. All solid waste would be handled and recycled or disposed of properly to ensure it would not impact surface water and groundwater.

- Closure of all residential groundwater wells, underground utilities, and septic tanks. Wells would be over drilled and grouted. All well closures would comply with the "Water Well Licensing Regulations and Construction Standards" (TDEC 2005).

- All septic tanks would be pumped out and filled with concrete. Approximately 2,700 cubic yards of concrete is estimated to be required for this project. Additionally, TVA would work with regional gas and water utility companies to remove and/or cap all underground utilities in accordance with industry standards and regulatory requirements.

- All basements, pools, and ponds on the property would be filled in with fill dirt. If the infrastructure is left in place, then boreholes would be placed into the structure to allow for proper soil percolation and drainage. Approximately 7,500 cubic yards of fill would be required for the entire project. This fill would be obtained from the approved KIF borrow area on the peninsula or any other approved borrow source in the area.

Soil disturbances associated with these demolition activities can potentially result in adverse water quality impacts. Soil erosion and sedimentation can clog streams and groundwater features and can threaten aquatic life. The relevant actions would be performed in a manner so as to minimize these impacts.

Surface Water

Demolition activities have the potential to temporarily affect surface water via storm water runoff. TVA would comply with all appropriate state and federal permit requirements. More specifically a notice of intent would be submitted to TDEC for coverage under the *General NPDES Permit for Discharges of Storm Water Associated with Construction Activities* (TDEC 2011) for the entire project site. As part of this application, an SWPPP would be developed and implemented to control and confine sediment to the project site. This plan would identify specific BMPs to address demolition-related activities that would be adopted

to minimize storm water impacts. A complete list of BMPs and locations would be detailed in the site SWPPP. The BMPs that would be utilized for this project include, but are not limited to:

- Construction entrances and exits would be constructed or an existing road would be utilized at all points of entry and exit from the site to reduce any sediment leaving the site on vehicle tires.

- Silt fencing, riprap check dams, waddles, temporary sediment traps and basins, and buffer zones would be utilized as parameter and outlet protection.

- All denuded areas would be vegetated. Where soil disturbance would occur, the area would be ultimately stabilized and vegetated with native or nonnative, noninvasive grasses and mulched, as described in *A Guide for Environmental Protection and Best Management Practices for Tennessee Valley Authority Transmission Construction and Maintenance Activities* (Muncy 1999).

Additionally, if any stream crossings or work is to be performed in state waters, an Aquatic Resources Alteration Permit would be obtained from TDEC. With the performance of the demolition activities in accordance with the permit requirements, it is expected that the associated impact on the quality of the receiving waters would be minimized.

Additionally, buildings, roads, parking lots, and sidewalks prevent rain from percolating through the soil and result in additional runoff of water and pollutants into storm drains, ditches, and streams. Because the existing structures and infrastructure would be removed from the project site, the current storm water flows would be altered. This removal would decrease impervious surface area and would reduce the concentrated storm water flow off the project area, reestablishing a more natural runoff regime.

Groundwater
Activities that have the potential to temporarily affect groundwater are over drilling and grouting the groundwater wells, filling septic tanks, filling of basements and pools, and runoff from general demolition. It is assumed all houses have septic tanks located on the properties. Several of these houses have basements, and seven pools would be filled with borrow material.

Potential impacts to groundwater could result if sediments from excavated materials enter or clog sinkholes, springs, and other karst features and from the transport of contaminants such as fertilizers into sinkholes. BMPs as described in Muncy 1999 would be used during demolition to avoid contamination of groundwater in the project area. During vegetation, application of fertilizers would be avoided in the areas where karst features and springs occur to prevent groundwater contamination. With the use of BMPs, impacts to groundwater from the proposed action would be insignificant. It is likely that closure of the septic tanks would lead to an improvement in the groundwater quality in the immediate vicinity.

Other Wastewater Streams
Additional wastewater streams potentially generated during the proposed demolition project may include domestic sewage, nondetergent equipment washing, and dust control. Portable toilets would be provided for the additional construction workforce as needed. These toilets, in addition to the previously mentioned cleanout of septic tanks, would be

pumped out as needed, and the sewage would be transported by tanker truck to a publicly owned wastewater treatment works that accepts pumpout. Equipment washing and dust control discharges would be handled in accordance with BMPs described in the SWPPP for water-only cleaning and dust control.

Direct, Indirect, and Cumulative Impacts
Under the Action Alternative, proper implementation of controls is expected to result in minor and temporary direct and indirect impacts to surface waters. No direct impacts to groundwater from the project are expected. Temporary, indirect impacts to groundwater flow could result from some of the proposed demolition techniques. These impacts would not be significant. No cumulative impacts to surface water or groundwater are anticipated.

3.7. Land Use

3.7.1. Affected Environment

The houses and structures sit on the more than 900 acres of land purchased by TVA after the KIF ash spill. Most of the area is characterized by silt loam soils previously covered by grass, scrub, pasture, and mixed forests. Very little of this land is considered prime farmland. The section northwest of Swan Pond Road is characterized by areas with a 12-20 percent slope. The vicinity around Hassler Mill Road has areas with as much as 45 percent slope and an area that floods frequently. The area within Swan Pond Circle contains about 30 acres of prime farmland (mostly wooded) with less than 5 percent slope, but the majority of the area (about 220 acres) is covered with forests and grasses with a slope of 12-20 percent. The vicinity surrounding Lakeshore Drive is also characterized by forested and grassland areas with a small percentage of prime farmland. The properties on Emory River Road consist of four lots slated for house removal—two of the lots are fairly open, while the other two are wooded. During construction of these houses and structures, the land was cleared, leveled, and lots were landscaped with shrubs, flowers, trees, and possibly turf grass.

3.7.2. Environmental Consequences

3.7.2.1. No Action Alternative

Under the No Action Alternative, TVA would not demolish the structures. Environmental conditions in the project area would not change, and anticipated health and safety benefits would not occur in the region. Adoption of this alternative would not meet TVA's safety standards or objectives.

3.7.2.2. Proposed Action Alternative

Under this proposed action, houses, structures, concrete foundations, driveways, and utilities would be removed, and the areas would be restored to predevelopment use. This would include restoring the grasses or planting native and noninvasive plant species. Since this would return the land to a more natural condition, it would have no negative impacts on land use.

3.8. Terrestrial Ecology

3.8.1. Affected Environment

The project area occurs in a landscape mostly disturbed and shaped by development practices including residential buildings, outbuildings, farmland, roadways, and docks along waterways. In addition, the project area is immediately adjacent to KIF, a large power

facility whose footprint greatly contributes to the disturbance of any local wildlife habitats. While much of the proposed project area does occur in woodland areas, these habitats have been highly disturbed and consist of small patches of lower-quality edge habitat.

The wildlife habitat that does occur in the project area is composed primarily of woody and herbaceous vegetation, providing habitat for common bird species that are highly tolerant of disturbance, such as Carolina wren, American robin, red-tailed hawk, tufted titmouse, northern cardinal, field sparrow, and song sparrow. Mammals such as eastern mole, white-footed mouse, prairie vole, and larger mammals such as eastern cottontail, woodchuck, common raccoon, coyote, and white-tailed deer can be abundant in these disturbed habitats. Reptiles often found in these habitats include yellow-bellied slider, black rat snake, and common garter snake.

Wetlands and streams occurring within areas are dominated by herbaceous vegetation and provide habitat for amphibians including American toad, green frog, northern cricket frog, upland chorus frog, and red-spotted newts.

Immediately adjacent to the project area, the Emory and Clinch rivers provide riparian habitat for raptors such as bald eagles and osprey, as well as other birds including great egrets, great blue herons, and belted kingfishers. These areas also provide habitat for amphibians such as hellbender, northern cricket frog, and red-spotted newts. One osprey pair has been observed nesting within the project area on the northwest corner of property #178.

More than 500 artificial tree swallow nest boxes have been established in the vicinity of KIF and other nearby reservoirs as part of a large, ongoing effort to monitor the ecological impacts of the Kingston ash spill. Of the boxes, 100 occur within the project area proposed for demolition along the banks of the Emory River (see Figure 3-6 for a map of the location of tree swallow boxes).

A review of the TVA Natural Heritage database found four recorded heron colonies within 3 miles of the proposed project area. The nearest colony is approximately 900 feet away. No recorded caves or other unique areas have been reported within 3 miles of the project area.

Based on review of the TVA Natural Heritage database for records of terrestrial animals as identified in Table 3-5, one federally protected species (bald eagle) has been documented within 3 miles of the project area. In addition, one federally listed species (gray bat) has been documented within Roane County, Tennessee, but not within 3 miles of the project area.

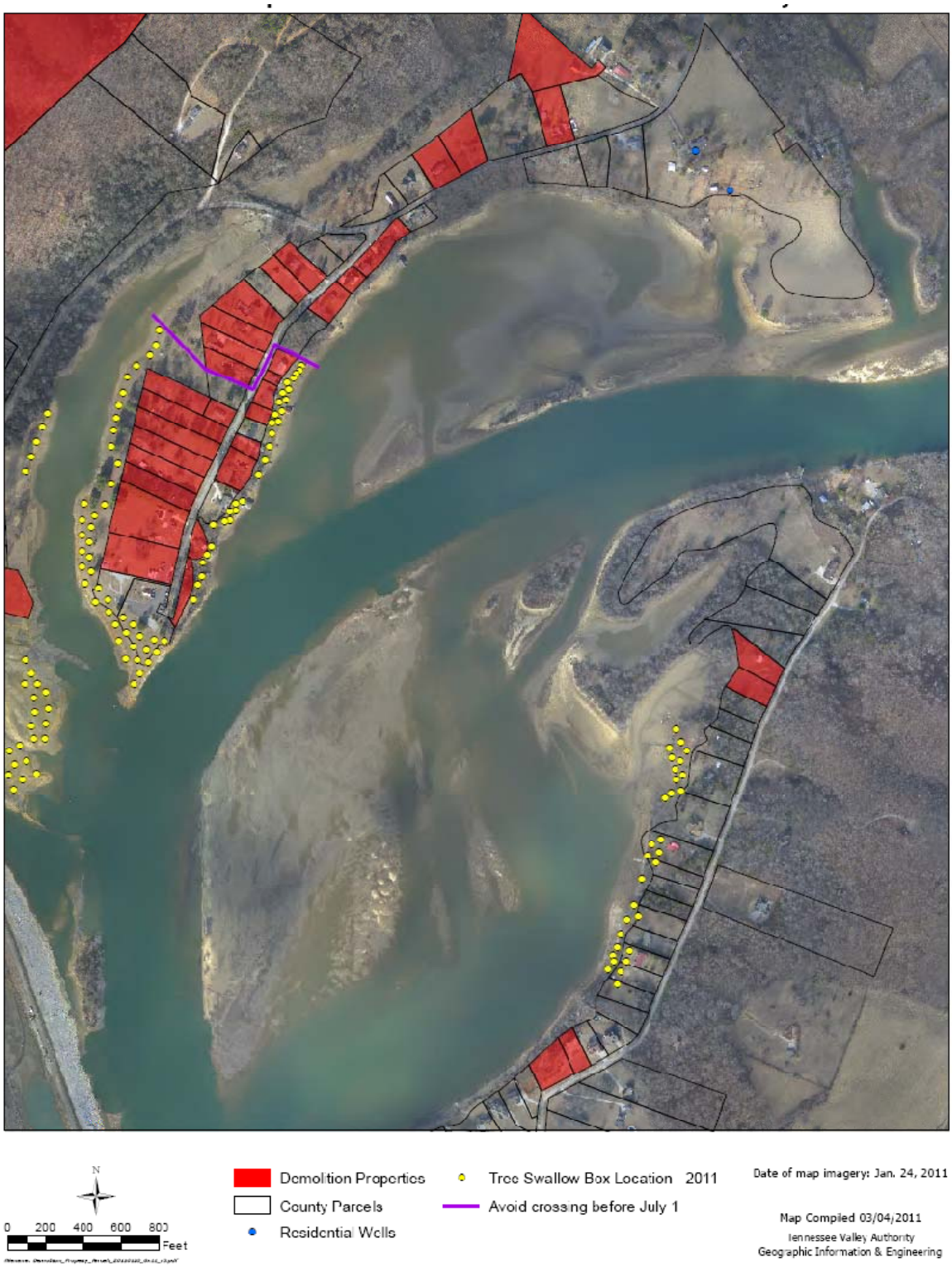

Figure 3-6. Demolition Properties and Tree Swallow Nest Boxes – Emory River

Table 3-5. Federally Listed Terrestrial Animal Species From Roane County, Tennessee, and/or Within a 3-Mile Radius of the Proposed Project Area

Common Name	Scientific Name	Status[1]	
		Federal	State (Rank[2])
Bird			
Bald eagle	*Haliaeetus leucocephalus*	DM	PROT (S3)
Mammal			
Gray bat	*Myotis grisescens*	LE	PROT (S2)

Source: TVA data February 2011
[1]**Status Codes:** LE = Listed endangered, DM = Recovered, delisted, and being monitored, PROT = Protected
[2]**State Ranks:** S2 = Very rare and imperiled within the state or because of some factor(s) making it vulnerable to extinction; S3 = Rare or uncommon in the state

Bald eagles were removed from the endangered species list but are still protected under the Bald and Golden Eagle Protection Act and the Migratory Bird Treaty Act. Both acts prohibit harm to eagles or their nests. Bald Eagles nest in forested areas near large bodies of water, such as rivers and reservoirs, where they forage (Bryan et al. 2005; Thompson et al. 2005).

Gray bats roost in caves year-round and typically forage over streams, rivers, and reservoirs (Tuttle 1976). Gray bats have been reported in Roane County during field surveys. These records were collected from a distance of more than 5 miles from the proposed project site. In addition, no caves have been identified in the project area. None of the preferred habitats for this species occur in the project area.

3.8.2. Environmental Consequences

3.8.2.1. No Action Alternative

Under the No Action Alternative, the demolition of residential property would not occur, and the project area would remain in its current condition. Wildlife and wildlife habitats would not be affected by any project-related actions. Therefore, there would be no direct, indirect, or cumulative impacts to wildlife under the No Action Alternative.

Further, under the No Action Alternative, since TVA would not perform demolition activities, resulting potential for impacts to endangered and threatened species would not occur. The status and conservation of the potentially affected listed species would continue to be determined by the actions of others. Changes to the area would nonetheless occur over time, as factors such as population trends, land use and development, quality of air/water/soil, recreational patterns, and cultural, ecological, and educational interests change within the area. Therefore, there would be no direct, indirect, or cumulative impacts on endangered and threatened species and their critical habitats under the No Action Alternative.

3.8.2.2. Proposed Action Alternative

Under the Action Alternative, the demolition of man-made structures would result in a change in the composition of wildlife habitats in the project area. Initial clearing likely would

temporarily displace larger animals, such as deer and turkey, from the project area into surrounding areas. Some smaller, less mobile animals occupying the areas to be cleared, such as mice, shrews, frogs, and salamanders, would be impacted by the demolition activities. Most species that would be affected by these changes are common locally and regionally.

Following demolition of structures and removal of debris, the area would be incorporated permanently into the KIF boundaries. Wooded areas within the project area that were cleared would be revegetated and eventually provide early successional habitat. This would result in an overall change in species composition in the area, favoring early successional and edge species. The loss of forest habitats in the proposed project area and further fragmentation of adjacent forested areas would negatively affect forest wildlife and species dependent on forest-interior habitats. However, most of the forested habitats in the project area are already largely fragmented and disturbed, and sensitive or listed species most likely do not occur in the area.

Demolition activities have potential to negatively affect breeding activities of the tree swallow populations associated with the environmental study occurring at the site. Tree swallows are very sensitive to disturbance during the breeding season, which can greatly contribute to reduced nest success rates through various causes including delayed nest building and egg laying, egg and nestling abandonment, reduced parental care, and egg failure. Although demolition activities will be temporary, even brief disturbances during the nestling stage can greatly increase rates of nest failure in the tree swallow population (Michelle Beck, Virginia Tech, personal communication, March 2011).

Since proposed demolition activities would occur in close proximity to populations of breeding tree swallows on-site, several measures would be taken to reduce impacts and disturbance to these birds. Demolition activities occurring immediately adjacent to the location of tree swallow boxes would not occur during the breeding season for this species, March 1 through July 1 as depicted in Figure 3-6. In addition, sufficient buffers have been added around tree swallow box locations to help minimize disturbance to nesting birds. As well, demolition would not occur on property #178 between February 1 and July 15 to minimize disturbance to nesting osprey. With the implementation of these seasonal and physical avoidance measures, populations of nesting tree swallows and osprey at the site would not be impacted by proposed demolition activities.

The Endangered Species Act (ESA) requires federal agencies to conserve endangered and threatened species and to determine the effects of their proposed actions on endangered and threatened species and their critical habitat. Endangered species are those determined to be in danger of extinction throughout all or a significant portion of their range. Threatened species are those determined to be likely to become endangered within the foreseeable future. Section 7 of the ESA requires federal agencies to consult with the United States Fish and Wildlife Service (USFWS) when their proposed actions may affect endangered or threatened species and their critical habitats.

The State of Tennessee provides legal protection for species considered threatened, endangered, or deemed in need of management within the state other than those federally listed under the ESA. The legal listing is handled by the Tennessee Wildlife Resources Agency; however, the TDEC's Natural Heritage Inventory Program and TVA both maintain databases of plant and animal species that are considered threatened, endangered, or of

special concern in Tennessee. These species, as well as species listed under the ESA, are discussed in this section.

A review of the TVA Natural Heritage database found four recorded heron colonies within 3 miles of the proposed project area. The nearest colony is approximately 900 feet from the project area. Because of the distance between this heronry and the project area, these and other heronries in the area would not be affected by the proposed actions.

While no recorded bald eagle nests occur within 3 miles of the project, suitable roosting and foraging habitat for the species does occur within the project area. Portions of the project area are located along the Clinch and Emory rivers, large bodies of water that provide suitable foraging habitat for this species. Portions of the project area are found in wooded areas, which can offer potential roosting habitat for bald eagles (Bryan et al. 2005, Thompson et al. 2005). Given the abundance of suitable habitat in the vicinity of the project area and lack of documented nests within the project site, impacts to bald eagles are not expected to occur as a result of proposed actions (USFWS 2007).

Suitable roosting habitat (caves) for gray bats is not available in the project area. Several small streams in the area provide suitable foraging habitat within the proposed project area for gray bats (Tuttle 1976). Since standard BMPs that minimize sediment and pollutant input into water bodies would be implemented during construction activities, the proposed Action Alternative would not affect this foraging habitat.

There would be no direct, indirect, or cumulative impacts to federally or state-listed terrestrial animal species or their habitats as a result of the proposed Action Alternative.

3.9. Noise

3.9.1. Affected Environment

The primary affected environments from the razing and associated activity noise include the workers and residents who live along the trucking routes for materials that are hauled into and out of the operation. Section 3.2, Transportation, describes the proposed hauling routes from KIF to four proposed landfills. The majority of the hauling routes are four-lane interstates and state highways. See Section 3.2 for potential trucking routes.

3.9.2. Environmental Consequences

3.9.2.1. No Action Alternative

Under the No Action Alternative, TVA would not demolish the structures. Environmental conditions in the project area would not change, and anticipated health and safety benefits would not occur in the region. Adoption of this alternative would not meet TVA's safety standards or objectives.

3.9.2.2. Proposed Action Alternative

The proposed project at Kingston would involve site preparation and removal of the existing structures. Heavy construction equipment for this project would include (but may not be limited to) stationary equipment (generators, and compressors), an excavator, dump trucks, bulldozer, and possibly a jackhammer. This project may create temporary or intermittent short-term annoyance for the local community, which would cease after the construction of the project.

Construction equipment is operated in two modes: stationary and mobile. Stationary equipment operates in one location for one or more days at a time. Mobile equipment (such as bulldozers, graders, and loaders) moves around a construction site with power applied in cyclic fashion. Noise impacts from stationary equipment are assessed from the center of the equipment, while noise impacts for mobile construction equipment are assessed from the center of the equipment activity or construction site.

Noise is measured in decibels. Because not all noise frequencies are perceptible to the human ear, A-weighted decibels (dBA), which filter out sound in frequencies above and below human hearing, are typically used in noise assessments. Short-term maximum noise levels generated by heavy construction equipment can possibly range from approximately 68 dBA to in excess of 100 dBA when measured at 50 feet. These types of noise levels would diminish with distance from the construction site at a rate of approximately 6 dBA per each doubling of distance. For the purposes of this analysis, an overall noise level of 86 dBA-equivalent noise level at 50 feet is being used as the worst-case scenario where stationary equipment, an excavator, dump truck, and a bulldozer are operating simultaneously at the center of the site.

The equipment used for site preparation and debris removal would be inspected for properly functioning mufflers prior to operation. These operations would be limited to daylight hours, and would cause insignificant, short-term impacts. Likewise, the noise from the site preparation would cause insignificant impacts because the site preparation would be very short in duration, and it would occur during daylight hours.

None of the intruding noise would be high enough to cause hearing loss for any of the nearby residents. Possible environmental noise impacts are decreased by requiring well-maintained equipment for all operations and using an adaptive management process to manage haul routes. Overall, the environmental noise impacts from the demolition and associated activities should be insignificant with these noise control and operational limitation commitments.

3.10. Archaeological and Historic Resources

3.10.1. Affected Environment

East Tennessee has been an area of human occupation for the last 12,000 years. This includes five broad cultural periods: Paleo-Indian (11,000-8,000 B.C.), Archaic (8000-1000 B.C.), Woodland (1600 B.C.-A.D. 1000), Mississippian (A.D. 1000-1600), and Historic (A.D. 1600-to present). Prehistoric land use and settlement patterns vary during each period, but short- and long-term habitation sites are generally located on floodplains and alluvial terraces along rivers and tributaries. Specialized campsites tend to be located on older alluvial terraces and in the uplands. In east Tennessee, during the 17th and 18th centuries, Europeans and Native Americans began interacting through the fur trading industry.

European-American expansion into eastern Tennessee began after the Revolutionary War, with settlement concentrated along the fertile valleys of the Tennessee River. As European-American settlement increased, the Cherokee were forced to give up their land. Permanent European-American settlement near the project area began after the Treaty of Tellico Blockhouse in 1798, which ceded the land between the Clinch River and Cumberland Mountain to the United States.

Roane County was created in 1801. The town of Kingston, at the confluence of the Clinch and Tennessee rivers, was designated the Roane County seat. Small-scale or subsistence farming was the principal occupation of most 19th-century residents in Roane County. Although agriculture made up most of the economy in eastern Tennessee, the commercial potential of local mineral deposits was recognized. Union Colonel John Wilder, with other northern industrialists, organized the Roane Iron Company, and in 1868, established the town of Rockwood, the "Company Town of the New South," shipping pig iron first by steamboat and later by rail. During the civil war, no major battles were fought in the area, but the importance of controlling transportation networks that passed through the area led to skirmishes. In the 1930s-1940s, the federal government made its presence known in Roane County by the development of TVA. In 1939, construction began on Watts Bar Dam, part of a system of dams and locks on the Tennessee River intended to improve navigation and control flooding. In the early 1950s, TVA constructed KIF. The dam and plant provided jobs, flood control, and electricity to Roane County (Hall and Parker 1998; Killebrew 1974).

TVA considers the area of potential effects (APE) to be the footprint of the acquired properties (approximately 900 acres) where land disturbance may occur. Three previously recorded archaeological sites (40RE335, 40RE416, 40RE580) and two cemeteries (Adkisson and Swan Pond Methodist cemeteries) are located within the APE.

TVA contracted with TRC Environmental Corporation to conduct a cultural resources survey of the proposed APE. No previously unrecorded archaeological sites and nine historic structures (Table 3-6) were identified within the APE (Karpynec et al. 2010a; 2010b; 2010c). These resources are considered ineligible for the National Register of Historic Places (NRHP) due to lack of architectural distinction and/or loss of integrity.

Table 3-6. Historic Structures

Historic Structure #	Type	NRHP Eligibility
HS1-10-10	ca. 1960 Ranch	Not eligible/Lack of architectural distinction
HS2-10-10	ca. 1955 Ranch	Not eligible/Lack of architectural distinction
HS1-8-10	ca. 1960 Minimal Traditional	Not eligible/Lack of architectural distinction
HS2-8-10	ca. 1947 Gable Front	Not eligible/Lack of architectural distinction
HS3-8-10	ca. 1947 Minimal Traditional	Not eligible/Lack of architectural distinction
HS4-8-10	ca. 1955 Ranch	Not eligible/Lack of architectural distinction
HS5-8-10	ca. 1925 Craftsman/Bungalow	Not eligible/Modern alterations
HS6-8-10	ca. 1955 Ranch	Not eligible/Lack of architectural distinction
HS7-8-10	ca. 1930 Gable Front	Not eligible/Lack of architectural distinction

3.10.2. Environmental Consequences

Historic and cultural resources, including archaeological resources, are protected under various federal laws, including the Archaeological Resources Protection Act, the Native American Graves Protection and Repatriation Act, and the National Historic Preservation Act (NHPA). Section 106 of the NHPA requires federal agencies to consult with the respective State Historic Preservation Officer (SHPO) when proposed federal actions could affect these resources.

3.10.2.1. No Action Alternative

There would be no project-related effects to historic or archaeological resources under this alternative. Likewise, no direct, indirect, or cumulative effects to these resources are expected by the proposed undertaking.

3.10.2.2. Proposed Action Alternative

As previously stated, three previously recorded archaeological sites (40RE335, 40RE416, 40RE580) and two cemeteries (Adkisson and Swan Pond Methodist cemeteries) are located within the APE. No ground disturbance activities would be conducted in the vicinity of the cemeteries. TVA previously consulted with the Tennessee SHPO regarding 40RE580, a historic artifact scatter, and received concurrence in a letter dated May 17, 2010, that the site was ineligible for the NRHP. Archaeological investigations within the APE did not relocate site 40RE335 (Karpynec et al. 2010c). Only a portion of 40RE416, a historic artifact scatter, extends within the APE (Karpynec et al. 2010b). In a letter dated December 16, 2010, the Tennessee SHPO concurred with TVA that the portion of site 40RE416 within the APE is ineligible for the NRHP.

Pursuant to regulations (36 CFR Part 800) implementing Section 106 of the NHPA, TVA consulted with the Tennessee SHPO to assess potential impacts to historic properties. In letters dated October 19, 2010, December 16, 2010, and January 7, 2011, the Tennessee SHPO concurred with TVA's determination that the proposed undertaking would not affect historic properties that are potentially eligible or currently listed in the NRHP (Appendix A).

Pursuant to 36 CFR § 800.2 (c)(2)(ii), 800.3 (f)(2), and 800.4 (a)(4)(b), TVA also consulted with the following federally recognized Indian tribes: Cherokee Nation, Eastern Band of Cherokee Indians, United Keetoowah Band of Cherokee Indians in Oklahoma, The Chickasaw Nation, Muscogee (Creek) Nation of Oklahoma, Alabama-Coushatta Tribe of Texas, Alabama-Quassarte Tribal Town, Kialegee Tribal Town, Thlopthlocco Tribal Town, Seminole Tribe of Florida, Absentee Shawnee Tribe of Oklahoma, Eastern Shawnee Tribe of Oklahoma, and Shawnee Tribe regarding properties within the proposed project's APE that may be of religious and cultural significance to them and eligible for the NRHP. TVA received comments from the Chickasaw Nation, Alabama-Coushatta Tribe of Texas, Eastern Shawnee Tribe of Oklahoma, and Seminole Tribe of Florida stating there would be no effect to religious or cultural properties to these tribes (Appendix A).

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CHAPTER 4

4.0 LIST OF PREPARERS

4.1. NEPA Project Management

Dave W. Robinson

Position:	Senior NEPA Specialist
Education:	B.S., Biology-Geology
Experience:	29 years in Permitted Environmental Programs
Involvement:	NEPA Compliance and Document Preparation

4.2. Other Contributors

Michael F. Broder, P.E.

Position:	Engineer
Education:	M.S. and B.S., Agricultural Engineering
Experience:	31 years in Agricultural and Environmental Engineering
Involvement:	Air Resources

J. Chris Buttram, P.E.

Position:	Senior Civil Engineer
Education:	B.S., Civil Engineering
Experience:	11 years in Civil/Site, Structural, and Highway Engineering
Involvement:	Transportation

Jacqueline G. Broder

Position:	Project Engineer
Education:	M.S., Agriculture
Experience:	28 years in Project Management, Environmental Evaluations, Technical Report Writing and Editing, and Proposal Preparation
Involvement:	Land Use

A. Michelle Cagley, P.E.

Position:	Regulatory Interface Specialist
Education:	B.C., Civil Engineering
Experience:	18 years in Environmental Engineering Compliance
Involvement:	Environmental Permits and Compliance, Kingston

James H. Eblen

Position:	Contract Economist
Education:	Ph.D., Economics; B.S., Business Administration
Experience:	44 years in Economic Analysis and Research
Involvement:	Socioeconomics and Environmental Justice

Ronald E. Hutson

Position:	Manager, Real Estate Services
Education:	B.S., Psychology; Associate, Business Management
Experience:	20 years in Midlevel Management
Involvement:	Project Manager

Holly G. Le Grand

Position:	Biologist/Zoologist
Education:	M.S., Wildlife; B.S., Biology
Experience:	7 years in Biological Surveys, Natural Resource Management, and Environmental Reviews
Involvement:	Terrestrial Zoology

Barbara V. E. Martocci

Position:	Senior Manager, Media Relations
Education:	M.A., Business Communications
Experience:	30 years in Communications and Utility Industry Work
Involvement:	Communications Representative

Michael E. McCombs

Position:	Senior Safety Manager/Industrial Hygienist
Education:	B.S., Professional Biology/Chemistry
Experience:	27 years in Safety/Industrial Hygiene Work
Involvement:	Noise and Health and Safety

W. Chett Peebles, RLA; ASLA

Position:	Specialist, Landscape Architect
Education:	Bachelor of Landscape Architecture
Experience:	22 years in Site Planning, Design, and Scenic Resource Management; 5 years in Architectural History and Historic Preservation
Involvement:	Visual Resources

Amos Smith

Position:	Contract Geologist
Education:	B.S., Geology
Experience:	32 years in Geological Surveys, Landfill Permitting, and Disposal
Involvement:	Solid Waste

Lori A. Whitehorse

Position:	Environmental Scientist
Education:	B.S., Environmental Science
Experience:	7 years in Waste Disposal and Site Assessments
Involvement:	Business Unit Project Lead/Project Initiator

A. Chevales Williams

Position:	Senior Environmental Engineer
Education:	B.S., Environmental Engineering
Experience:	8 years in Water Quality Monitoring and Compliance; 6 years in NEPA Planning and Environmental Services
Involvement:	Surface Water and Groundwater

W. Richard Yarnell

Position:	Archaeologist
Education:	B.S., Environmental Health
Experience:	39 years, Cultural Resource Management
Involvement:	Archaeological and Historic Resources

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CHAPTER 5

5.0 LIST OF AGENCIES, ORGANIZATIONS, AND PERSONS TO WHOM COPIES ARE SENT

Federal Agencies

National Park Service
United States Environmental Protection Agency

State Agencies

Tennessee Department of Environment and Conservation
Tennessee Wildlife Resources Agency

Individuals

The Honorable Troy Beets
Mayor of Kingston
Kingston, Tennessee

The Honorable Ron Woody
Roane County Executive
Kingston, Tennessee

The Honorable Chris Mason
Mayor of Harriman
Harriman, Tennessee

The Honorable James Watts
Mayor of Rockwood
Rockwood, Tennessee

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CHAPTER 6

6.0 LITERATURE CITED

Bryan, A. L., L. B. Hopkins, C. S. Eldridge, I. L. Brisbin Jr., and C. H. Jagoe. 2005. "Behavior and Food Habits at a Bald Eagle Nest in Inland South Carolina." *Southeastern Naturalist* 4(3):459–468.

Federal Emergency Management Agency (FEMA). 2010. *Debris Estimating Field Guide.* FEMA Pamphlet No. FEMA 329, September 2010. Available from <http://www.fema.gov/pdf/government/grant/pa/fema_329_debris_estimating.pdf>.

Hall, Jere, and Rachel Parker. 1998. Roane County. *The Tennessee Encyclopedia of History & Culture*. Nashville, Tennessee: Rutledge Hill Press.

Jacobs. 2009. *Kingston Ash Recovery Project Non-Time-Critical Removal Action Surface Water Monitoring Plan for the Emory, Clinch, and Tennessee* Rivers. Prepared by Jacobs for the Tennessee Valley Authority. Available from <http://www.tva.gov/kingston/admin_record/pdf/G/G19.pdf>.

Karpynec, Ted, Ramona Grunden, Jeffrey Holland, and Larissa Thomas. 2010a. *Phase I Cultural Resources Survey for the Kingston Fossil Ash Spill Recovery, Acquired Lands Disposition, Roane County, Tennessee.* Report submitted to Tennessee Valley Authority. Atlanta, Ga.: TRC Environmental Corporation.

———. 2010b. *Phase I Cultural Resources Survey of 52 Parcels Totaling 205 Acres Slated for Demolition in the Vicinity of the Kingston Fossil Plant, Roane County, Tennessee.* Report submitted to Tennessee Valley Authority. Atlanta, Ga.: TRC Environmental Corporation.

———. 2010c. *Phase I Cultural Resources Survey for the Kingston Fossil Ash Slide Recovery, Additional Acquired Lands Disposition for 12 Parcels (35 Acres), Roane County, Tennessee.* Report submitted to Tennessee Valley Authority. Atlanta, Ga.: TRC Environmental Corporation.

Killebrew, J. B. 1974. *Introduction to the Resources of Tennessee.* Nashville, Tenn.: Tavel, Eastman & Howell, reprinted from 1874 original publication.

Lloyd, Orville B. Jr., and William L. Lyke. 1995. *Groundwater Atlas of the United States,* Segment 10. Reston, Va.: United States Geological Survey.

Muncy, J. A. 1999. *A Guide for Environmental Protection and Best Management Practices for Tennessee Valley Authority Transmission Construction and Maintenance Activities*, revised edition. Edited by C. Austin, C. Brewster, A. Lewis, K. Smithson, T. Broyles, and T. Wojtalik. Norris: Tennessee Valley Authority, Technical Note TVA/LR/NRM 92/1.

Tennessee Department of Environment and Conservation. 2005. "Chapter 1200-4-9 Water Well Licensing Regulations and Well Construction Standards." *Rules of Tennessee Department of Environment and Conservation Bureau of Environment Division of Water Supply.* February 2005 (revised). Available from <http://www.tn.gov/sos/rules/1200/1200-04/1200-04-09.pdf>.

———. 2006. "Chapter 1200-1-7 Solid Waste Processing and Disposal." *Rules of Tennessee Department of Environment and Conservation Division of Solid Waste Management.* August 2006 (revised). Available from <http://www.state.tn.us/sos/rules/1200/1200-01/1200-01-07.pdf>.

———. 2008. *Final 2008 303(d) List.* Nashville, Tenn.: TDEC, Division of Water Pollution Control, Planning and Standards Section, June 2008.

———. 2010. *Final 2010 303(d) List.* Nashville, Tenn.: TDEC, Division of Water Pollution Control, Planning and Standards Section, August 2010.

———. 2011. *General NPDES Permit for Discharges of Storm Water Associated With Construction Activities.* 2011 Draft Form. Retrieved from <http://www.tn.gov/environment/wpc/stormh2o/draft/tnr100000_cgp_draft.pdf> (n.d.).

Tennessee Department of Transportation. 2009. *Total Road Mileage and Vehicle Miles of Travel in Tennessee.* Available at <http://www.tdot.state.tn.us/projectplanning/adt/2009ADTBOOK.pdf>.

Tennessee Valley Authority. 2009a. *Initial Emergency Response Action for the Kingston Fossil Plant Ash Dike Failure Environmental Assessment.*

———.. 2009b. *Emergency Dredging for the Kingston Fossil Plant Ash Dike Failure Final Environmental Assessment*.

———. 2009c. *Tennessee Valley Authority Safety Manual, Revision 14. Available at* http://wikip.cha.tva.gov/wiki/Safety:Main_Page.

Thompson, C. M., P. E. Nye, G. A. Schmidt, D. K. Garcelon. 2005. "Foraging Ecology of Bald Eagles in a Freshwater Tidal System." *Journal of Wildlife Management* 69(2):609–617.

Transportation Research Board. 2000. *Highway Capacity Manual.*

Tuttle, M. D. 1976. "Population Ecology of the Gray Bat (*Myotis grisescens*): Philopatry, Timing, and Patterns of Movement, Weight Loss During Migration, and Seasonal Adaptive Strategies." *Occasional Papers of the Museum of Natural History*, 54:1-38. University of Kansas.

United States Census Bureau. 2000. *United States Census of Population.* Retrieved from <http://www.census.gov/main/www/cen2000.html> (n.d.).

United States Department of Commerce. 2010. *Latest Information: Federal Recovery Programs and BEA Statistics.* Bureau of Economic Analysis (BEA). Retrieved from <http://www.bea.gov/regional/reis/> (n.d.).

United States Department of Transportation (USDOT). 2010. *Large Truck and Bus Crash Facts 2008*, USDOT, Federal Motor Carrier Safety Administration Analysis Division. FMCSA-RRA-10-043, March 2010. Available from http://www.fmcsa.dot.gov/facts-research/LTBCF2008/LargeTruckandBusCrashFacts2008.pdf

United States Environmental Protection Agency. 2008. "National Primary and Secondary Ambient Air Quality Standards." 71 *Federal Register* 200 (1 July 2008) [codified at 40 CFR Part 50].

———. 2010. *Local Drinking Water Information*. Retrieved from <http://www.epa.gov/safewater/dwinfo/index.html> (n.d.).

United States Fish and Wildlife Service (USFWS). 2007. *National Bald Eagle Management Guidelines.* Arlington, Va.: USFWS.

United States Geological Survey and Tennessee Department of Environment and Conservation, 1995. *Water Use in Tennessee*. Retrieved from <http://tn.water.usgs.gov/wustates/tn/mapdatagw95.html> (n.d.).

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Appendix A – Correspondence Related to Section 106 Compliance

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the Chickasaw Nation

Headquarters

Bill Anoatubby, Governor
Jefferson Keel, Lt. Governor

August 27, 2010

Ms. Pat Ezell
Historian and Native American Liaison
Tennessee Valley Authority
400 West Summit Hill Drive
Knoxville, TN 37902-1499

Dear Ms. Ezell:

Thank you for your notification of the proposed projects delineated on the enclosed list for Roane County, Tennessee.

The area described is within the aboriginal hunting and trading lands of the Chickasaw Nation. We do not presently know specific historic properties or properties of significant religious or sacred value at this time. However, in the event of inadvertent discoveries, we expect all construction activities to cease, and to be notified according to all applicable state and federal laws.

If you have any questions, please contact Ms. Gingy Nail, historic preservation officer at (580) 559-0817, gingy.nail@chickasaw.net or Ms. Julie Ray, historic preservation and repatriation manager at (580) 559-0825, julie.ray@chickasaw.net.

Sincerely,

Jefferson Keel, Lt. Governor
The Chickasaw Nation

jar

enclosure

Arlington at Mississippi · Post Office Box 1548 · Ada, OK 74821-1548 · 580-436-2603 · www.chickasaw.net

UNITED WE THRIVE

Tennessee Valley Authority
Proposed Projects List

Description	Location
Integrate clean renewable energy, micro grids, energy efficient measures, water conservation and waste recycling measures with the goal of creating clean and green recreational areas – Melton Hill Green Technology Project	Roane County, Tennessee
Disposition plan for 52 properties purchased as a result of the December 2008 Kingston Fossil Plant ash spill – plans to demolish all existing structures and allow the land to either revert to a natural setting or be used for community purposes	Roane County, Tennessee

SEMINOLE TRIBE OF FLORIDA
TRIBAL HISTORIC PRESERVATION OFFICE

TRIBAL HISTORIC
PRESERVATION OFFICE

SEMINOLE TRIBE OF FLORIDA
AH-TAH-THI-KI MUSEUM

34725 WEST BOUNDARY ROAD
CLEWISTON, FL 33440

PHONE: (863) 983-6549
FAX: (863) 902-1117

TRIBAL OFFICERS
CHAIRMAN
MITCHELL CYPRESS
VICE CHAIRMAN
RICHARD BOWERS JR.
SECRETARY
PRISCILLA D. SAYEN
TREASURER
MICHAEL D. TIGER

Pat Bernard Ezzell
Tennessee Valley Authority
400 West Summit Hill Drive
Knoxville, Tennessee 37902-1499

THPO#: 006693

August 31, 2010

Subject: Kingston Fossil Ash Spill Recovery, Acquired Lands Disposition, Roane County, Tennessee

Dear Mrs. Ezzell,

The Seminole Tribe of Florida's Tribal Historic Preservation Office (STOF-THPO) has received the Tennessee Valley Authority's correspondence concerning the aforementioned project. The STOF-THPO has no objection to your findings at this time. However, the STOF-THPO would like to be informed if cultural resources that are potentially ancestral or historically relevant to the Seminole Tribe of Florida are inadvertently discovered during the construction process. We thank you for the opportunity to review the information that has been sent to date regarding this project. Please reference THPO-006693 for any related issues.

We look forward to working with you in the future.

Sincerely,

Willard Steele
Tribal Historic Preservation Officer
Seminole Tribe of Florida

Direct routine inquiries to:

Anne Mullins
Compliance Review Supervisor
annemullins@semtribe.com

JLP:am

TENNESSEE HISTORICAL COMMISSION
DEPARTMENT OF ENVIRONMENT AND CONSERVATION
2941 LEBANON ROAD
NASHVILLE, TN 37243-0442
(615) 532-1550

October 19, 2010

Mr. A. Eric Howard
Tennessee Valley Authority
400 West Summit Hill Drive
Knoxville, Tennessee 37902-1499

RE: TVA, CULTURAL RESOURCES ASSESSMENT, KINGSTON ASH SPILL/52 PROPERTIES, UNINCORPORATED, ROANE COUNTY, TN

Dear :

At your request, our office has reviewed the above-referenced cultural resources survey report in accordance with regulations codified at 36 CFR 800 (Federal Register, December 12, 2000, 77698-77739). Based on the information provided, we concur that the project area contains no historic properties eligible for listing in the National Register of Historic Places.

If project plans are changed or archaeological remains are discovered during construction, please contact this office to determine what further action, if any, will be necessary to comply with Section 106 of the National Historic Preservation Act.

Your cooperation is appreciated.

Sincerely,

E. Patrick McIntyre, Jr.
Executive Director and
State Historic Preservation Officer

EPM/jmb

Date Rec'd.:_____
Saved:_____
Sent to:_____
File:_____

TENNESSEE HISTORICAL COMMISSION
DEPARTMENT OF ENVIRONMENT AND CONSERVATION
2941 LEBANON ROAD
NASHVILLE, TN 37243-0442
(615) 532-1550

December 16, 2010

Mr. A. Eric Howard
Tennessee Valley Authority
400 West Summit Hill Drive
Knoxville, Tennessee 37902-1499

RE: TVA, CULTURAL RESOURCES ASSESSMENT, KINGSTON ASH SLIDE
ACQUIRED LANDS, UNINCORPORATED, ROANE COUNTY, TN

Dear Mr. Howard:

At your request, our office has reviewed the above-referenced cultural resources survey report in accordance with regulations codified at 36 CFR 800 (Federal Register, December 12, 2000, 77698-77739). Based on the information provided, we concur that the project area contains no historic properties eligible for listing in the National Register of Historic Places.

If project plans are changed or archaeological remains are discovered during construction, please contact this office to determine what further action, if any, will be necessary to comply with Section 106 of the National Historic Preservation Act.

Your cooperation is appreciated.

Sincerely,

E. Patrick McIntyre, Jr.
Executive Director and
State Historic Preservation Officer

EPM/jmb

From: Robin Dushane [mailto:RDushane@estoo.net]
Sent: Tuesday, January 04, 2011 12:07 PM
To: Ezzell, Patricia Bernard
Subject: RE: TVA, KINGSTON FOSSIL ASH SLIDE RECOVERY, ADDITIONAL TWELVE ACQUIRED LANDS, ROANE COUNTY, TN

Pat,
Our department has reviewed this proposal and have concluded we are in agreement with TVA's determination of "no historic properties affected".
Thank you for the opportunity to comment.
Sincerely,

Robin Dushane
Eastern Shawnee Tribe
Cultural Preservation Director
12705 S. 705 Rd.
Wyandotte, OK 74370
918 666 2435 ext 247 wk
918 533 4104 cell

From: Ezzell, Patricia Bernard [mailto:pbezzell@tva.gov]
Sent: Tuesday, December 21, 2010 7:38 PM
To: rallen@cherokee.org; Tyler B. Howe; Lisa Larue; espain@muscogeenation-nsn.gov; tisham@muscogeenation-nsn.gov; aberryhill@muscogeenation-nsn.gov; Bryant J. Celestine; Augustine Asbury; hlharjo@yahoo.com; CHARLES COLEMAN; Elliott York; Jennifer Pietarila; ndeere@seminolenation.com; Karen Kaniatobe; Robin Dushane; Kim Jumper
Cc: russtown@nc-cherokee.com; annemullins@semtribe.com
Subject: TVA, KINGSTON FOSSIL ASH SLIDE RECOVERY, ADDITIONAL TWELVE ACQUIRED LANDS, ROANE COUNTY, TN

Good Morning,
I hope this email message finds you well. By this email, I am transmitting a letter regarding the acquisition of twelve more parcels as part of TVA's ongoing efforts to address the effects of the Kingston Fossil Plant ash slide. The previous correspondence is attached. Instructions on accessing the referenced report is found on the last page of the first pdf attachment.

As always, should you have any questions, please do not hesitate to contact me. If you have any comments on this undertaking, please respond by January 24.

Sincerely,

Pat

Pat Bernard Ezzell
Program Manager
Tribal Liaison and Corporate Historian
Tennessee Valley Authority
400 W. Summit Hill Drive
460 WT 11D-K
Knoxville, Tennessee 37902
Phone: (865) 632-6461
E-mail: pbezzell@tva.gov

TENNESSEE HISTORICAL COMMISSION
DEPARTMENT OF ENVIRONMENT AND CONSERVATION
2941 LEBANON ROAD
NASHVILLE, TN 37243-0442
(615) 532-1550

January 7, 2011

Mr. A. Eric Howard
Tennessee Valley Authority
400 West Summit Hill Drive
Knoxville, Tennessee 37902-1499

RE: TVA, CULTURAL RESOURCES ASSESSMENT, ASH SLIDE/ADD'L 12 ACQUIRED LANDS, KINGSTON, ROANE COUNTY, TN

Dear Mr. Howard:

At your request, our office has reviewed the above-referenced cultural resources survey report in accordance with regulations codified at 36 CFR 800 (Federal Register, December 12, 2000, 77698-77739). Based on the information provided, we concur that the project area contains no historic properties eligible for listing in the National Register of Historic Places.

If project plans are changed or archaeological remains are discovered during construction, please contact this office to determine what further action, if any, will be necessary to comply with Section 106 of the National Historic Preservation Act.

Your cooperation is appreciated.

Sincerely,

E. Patrick McIntyre, Jr.
Executive Director and
State Historic Preservation Officer

EPM/jmb

From: Bryant J. Celestine [mailto:celestine.bryant@actribe.org]
Sent: Friday, January 21, 2011 5:29 PM
To: Ezzell, Patricia Bernard
Subject: RE: TVA, KINGSTON FOSSIL ASH SLIDE RECOVERY, ADDITIONAL TWELVE ACQUIRED LANDS, ROANE COUNTY, TN

Pat,

We have no objections to the report or proposal.

Bryant J. Celestine
Historic Preservation Officer
Alabama-Coushatta Tribe of Texas
571 State Park Rd 56
Livingston, Texas 77351
936 - 563 - 1181
celestine.bryant@actribe.org