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**ALLEN FOSSIL PLANT
DECONTAMINATION AND DECONSTRUCTION
FINAL ENVIRONMENTAL ASSESSMENT
Shelby County, Tennessee**

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Symbols, Acronyms, and Abbreviations

AADT	Annual Average Daily Traffic
ACC	Allen Combined Cycle
ACM	Asbestos Containing Material
ACT	Allen Combustion Turbine
ALF	Allen Fossil Plant
APE	Area of Potential Effect
ARAP	Aquatic Resources Alteration Permit
BMP	Best Management Practices
CCW	Condenser Cooling Water
CFR	Code of Federal Regulations
CCR	Coal Combustion Residuals
CEQ	Council on Environmental Quality
CO₂	Carbon Dioxide
CT	Combustion Turbine
CWA	Clean Water Act
dB	Decibel(s)
dba	A-weighted decibel
EA	Environmental Assessment
EIS	Environmental Impact Statement
EO	Executive Order
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act
HUC	Hydrologic Unit Code
HUD	U.S. Department of Housing and Urban Development
IPaC	Information for Planning and Conservation
kV	Kilovolt
Ldn	Day-Night Sound Level
LOS	Levels of Service
MCL	Maximum Contaminant Level
mg/L	Milligrams per liter
MGD	Million gallons per day
MLGW	Memphis Light, Gas and Water Division
MRM	Mississippi River Mile
MS4	Municipal Separate Storm Sewer System
msl	Mean Sea Level
MW	Megawatt
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NORM	Naturally occurring radioactive material
NPDES	National Pollution Discharge Elimination System
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
PCB	Polychlorinated Biphenyls
PM	Particulate Matter
PM_{2.5}	Particle Sizes Less Than or Equal to 2.5 Micrometers
PM₁₀	Particle Sizes Less Than or Equal to 10 Micrometers
RCRA	Resource Conservation and Recovery Act
SHPO	State Historic Preservation Officer
SWPPP	Stormwater Pollution Prevention Plan
TDEC	Tennessee Department of Environment and Conservation
TENORM	Technically Enhanced Naturally Occurring Radioactive Materials
TMDL	Total Maximum Daily Load
TMSP	Tennessee Multi-Sector General Permit

TVA	Tennessee Valley Authority
TWRA	Tennessee Wildlife Resources Agency
USACE	U.S. Army Corps of Engineers
USC	United States Code
USCB	U.S. Census Bureau
USDA	U.S. Department of Agriculture
USFS	U.S. Forest Service
USFWS	U.S. Fish and Wildlife Service
V	Volt
VdB	Vibration decibels

CHAPTER 1 – PURPOSE AND NEED FOR ACTION

1.1 Introduction and Background

The Tennessee Valley Authority's (TVA) Allen Fossil Plant (ALF) is situated on approximately 502 acres of land TVA owns and/or leases located southwest of the City of Memphis in Shelby County, Tennessee, on the southern shore of McKellar Lake. McKellar Lake is an oxbow lake (a lake formed in the bend of a river – the Mississippi River in this case) (Figure 1-1). The plant was built in the 1950s by Memphis Light, Gas and Water Division (MLGW) and later purchased by TVA in 1984. ALF's three coal-fired generating units (Units 1, 2, and 3) produced approximately 4.8 billion kilowatt-hours of electricity per year, enough to supply 340,000 homes in the Memphis area. On March 31, 2018, these units were permanently retired under an agreement that TVA entered into with the U.S. Environmental Protection Agency (EPA).

TVA's agreement with the EPA is a Federal Facilities Compliance Agreement which resolved a dispute over how the Clean Air Act's New Source Review program applied to maintenance and repair activities at TVA's coal-fired power plants. TVA also entered into a judicial consent decree with the States of Alabama, Kentucky, Tennessee, and North Carolina, and three environmental advocacy groups - (1) the Sierra Club, (2) the National Parks Conservation Association, and (3) Our Children's Earth Foundation. The consent decree is substantively similar to the Federal Facilities Compliance Agreement. These agreements (collectively called the "EPA Agreements") require TVA to reduce emissions across its coal-fired generating system and take other actions at its coal plants, including retiring some of its units (hence TVA's retirement of ALF Units 1 through 3).

TVA is investigating the future disposition of buildings and structures at ALF that are no longer used for their original purpose of power generation. Figure 1-2 shows an overview of the proposed decontamination and deconstruction project area at the ALF plant site. The project area includes the buildings and structures located within the approximately 50-acre decontamination and deconstruction project area boundary. TVA has also identified four areas proposed for use as temporary laydown areas during construction and one area near the Allen Combined Cycle (ACC) Plant designated for light uses such as trailer placement or light vehicle parking. These temporary laydown areas and the light use area are previously disturbed sites located on land owned or leased by TVA in the vicinity of the decontamination and deconstruction project area.

To comply with the EPA Agreements and continue to provide reliable and affordable power, TVA replaced the ALF coal-fired plant with the ACC Plant. The ACC Plant became operational in 2018 and is comprised of three individual combustion turbine (CT) units, two of which operate on natural gas, each having a generating capacity of 330 megawatts (MW). The remaining unit is a combustion steam turbine with a capacity to produce 420 MWs. Additional generation for peaking operations is provided by the Allen Combustion Turbine (ACT) Plant, which is located within the ALF property boundary. The ACC and ACT will continue operations at this site and are not considered in this Environmental Assessment (EA). Similarly, the impact of activities associated with the closure of the ash disposal areas, metal cleaning pond and the coal yard will be assessed in separate environmental reviews, since all such activities would occur independently of the decontamination and deconstruction of ALF.

1.2 Purpose and Need

The purpose of the Proposed Action is to appropriately manage the disposition of the buildings and physical structures at ALF that are no longer needed for their original purpose of power generation. TVA needs to manage the disposition of the ALF site to provide necessary structures and facilities for ongoing site activities while considering capital cost, long-term operations and maintenance costs, environmental risks, safety and security at the plant site, and making the land available for future economic development.

1.3 Decision to be Made

This EA is being prepared to inform TVA decision makers and the public about the environmental consequences of TVA's decision regarding the future disposition of the buildings and physical structures at ALF that are no longer needed for their original purpose of power generation. The decision TVA must make is whether to demolish the facility to grade or to take no action.

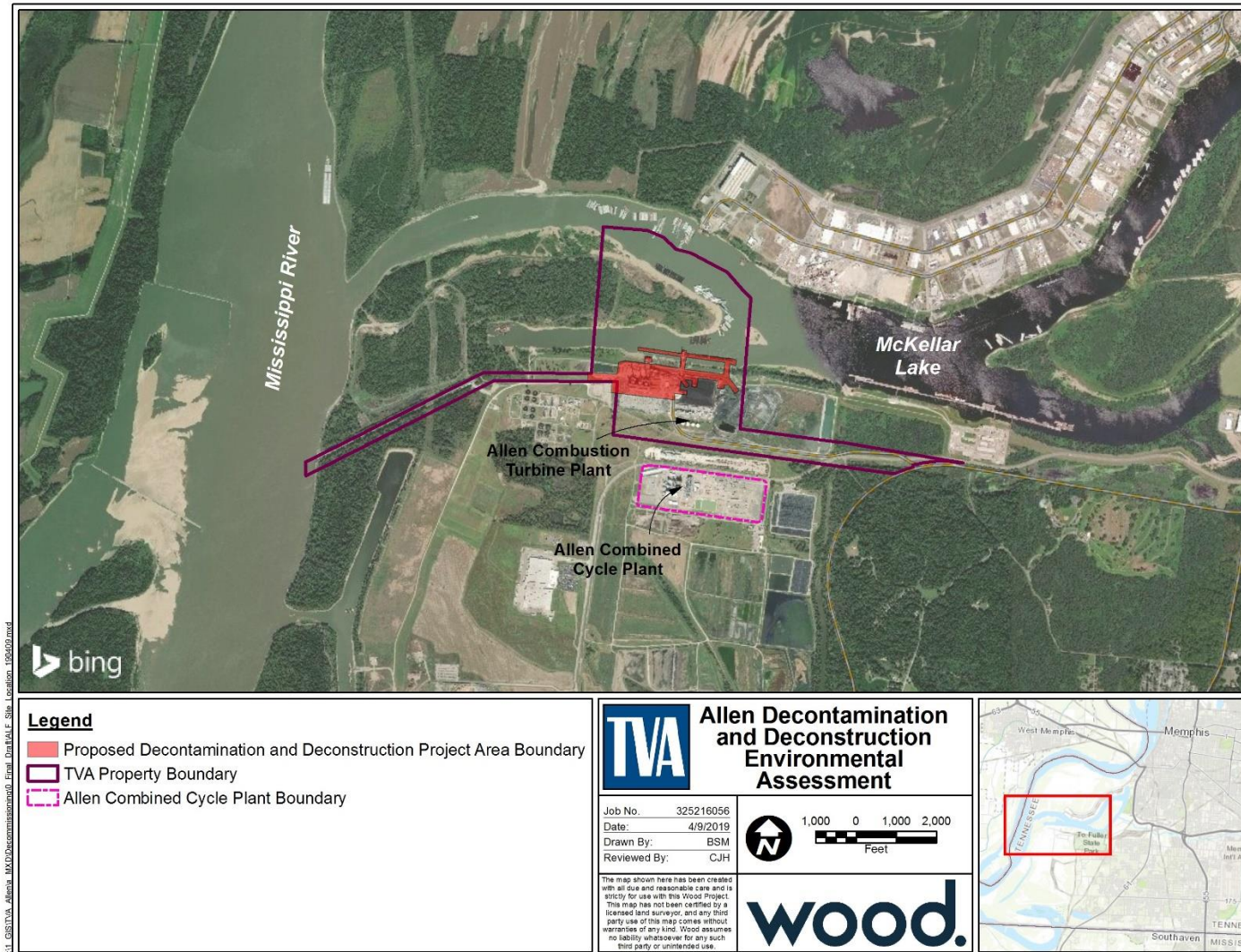


Figure 1-1. ALF Project Location

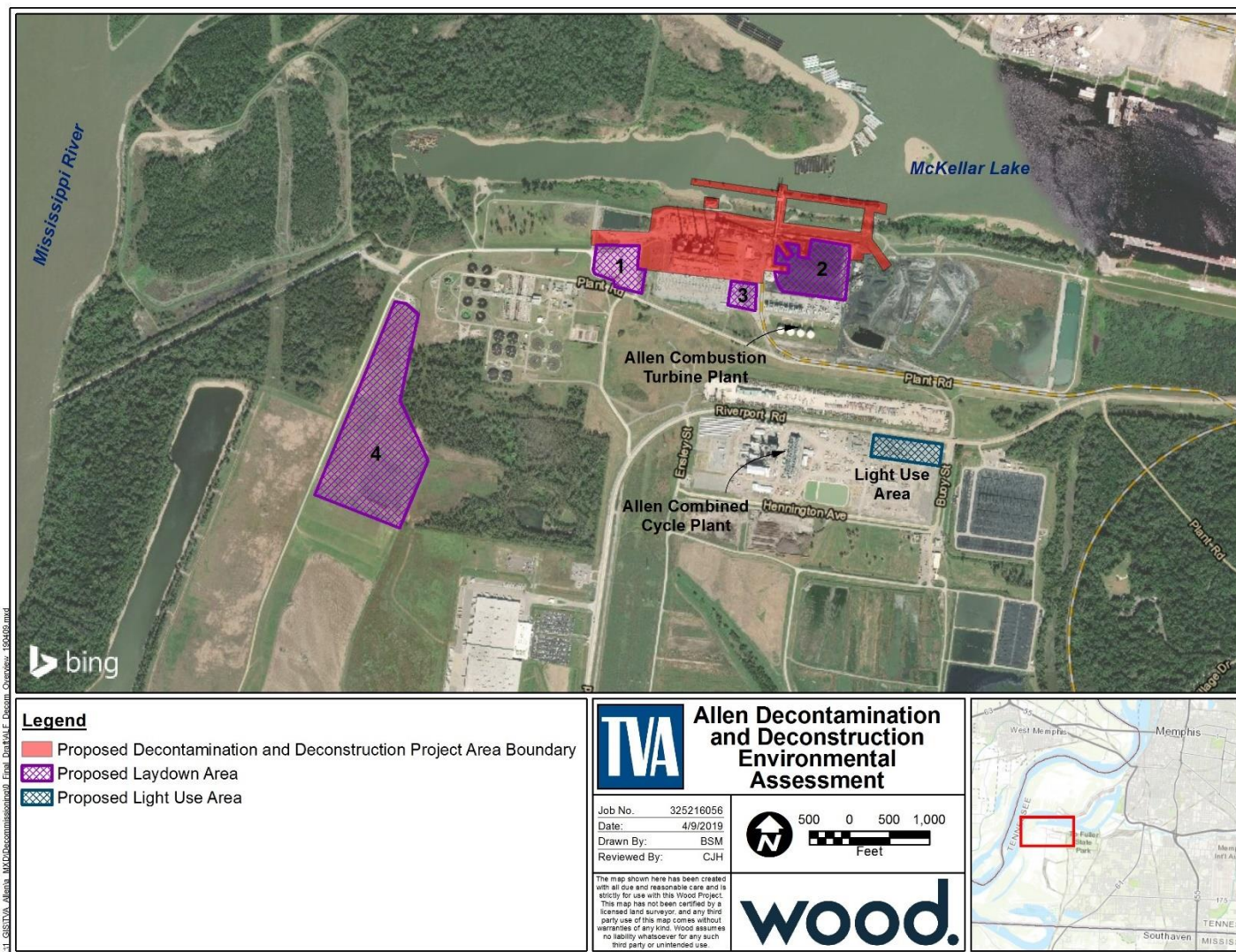


Figure 1-2. ALF Decontamination and Deconstruction Project Overview

1.4 Related Environmental Reviews and Consultation Requirements

Related environmental documents and materials were reviewed concerning this assessment. These included environmental assessments and reviews at ALF and the surrounding area for actions related to the proposed decontamination and deconstruction of the facility. The contents of these documents help describe the ALF proposed decontamination and deconstruction project area and are incorporated by reference as appropriate. Documents reviewed are listed below:

- *Final Ash Impoundment Closure Environmental Impact Statement, Part I Programmatic NEPA Review* (TVA 2016). The Final PEIS was prepared to address the closure of Coal Combustion Residuals (CCR) impoundments at all of TVA's coal-fired power plants. The report consists of two parts: Part I – Programmatic National Environmental Policy Act (NEPA) Review and Part II – Site-Specific NEPA Review. In Part I, TVA programmatically considered environmental effects of closure of CCR impoundments at all of its coal-fired plants. Part II – included a site-specific NEPA Review of closure of the West Ash Pond at ALF.
- *Integrated Resource Plan, 2015 Final Report* (TVA 2015b). This plan provides direction for how TVA will meet the long-term energy needs of the Tennessee Valley region. This document and the associated Supplemental Environmental Impact Statement evaluate scenarios that could unfold over the next 20 years. It discusses ways that TVA can meet future power demand economically while supporting TVA's equally important mandates for environmental stewardship and economic development across the Tennessee Valley. The report identified the closure of ALF and construction of the ACC plant at ALF as part of its strategy to deliver low-cost electricity, environmental stewardship, and economic development. TVA released the accompanying Final Supplemental Environmental Impact Statement for TVA's Integrated Resource Plan in July 2015 (TVA 2015a).
- *Allen Fossil Plant Emission Control Project 2014 Final Environmental Assessment* (TVA 2014). This EA assesses the impacts of replacing the coal-fired plant by constructing and operating the ACC on an approximately 73-acre site just south of ALF. Some of the laydown areas identified for this EA were previously evaluated in the 2014 EA.
- *Environmental Assessment of Development of Ash Management Strategy Allen Fossil Plant* (TVA 2006). This EA evaluated the impacts of alternatives for utilization or disposal of the ash at ALF.
- The findings in these documents related to this EA are included in Chapter 3 for each environmental resource, as appropriate.

1.5 Scope of the Environmental Assessment

TVA has prepared this EA to comply with NEPA and associated implementing regulations. TVA considered the possible environmental effects of the Proposed Action and determined that potential effects to the environmental resources listed below were relevant to the decision to be made; thus, the following environmental resources are addressed in detail in this EA:

- Land Use
- Prime Farmland
- Geology
- Groundwater
- Surface Water
- Floodplains
- Wetlands
- Aquatic Ecology
- Wildlife
- Vegetation
- Threatened and Endangered Species
- Air Quality and Climate Change
- Hazardous Materials and Solid and Hazardous Waste
- Transportation
- Noise
- Visual Resources
- Natural Areas, Parks, and Recreation
- Cultural Resources
- Utilities and Service Systems
- Safety
- Socioeconomics and Environmental Justice

TVA's action would satisfy the requirements of Executive Order (EO) 11988 (Floodplain Management), EO 11990 (Protection of Wetlands), EO 12898 (Environmental Justice), and EO 13751 (Invasive Species) and applicable laws including the National Historic Preservation Act, Endangered Species Act (ESA), Clean Water Act (CWA), and Clean Air Act.

1.6 Public and Agency Involvement

The ALF Decontamination and Deconstruction Draft EA was released for a 30-day public comment period on May 31, 2019. The availability of the Draft EA was announced in newspapers that serve the Shelby County area, and the Draft EA was posted on TVA's website. TVA's agency involvement included notification of the availability of the Draft EA to local, state, and federal agencies, and federally recognized tribes as part of the review. Chapter 5 provides a list of agencies, tribes, and organizations notified of the availability of the Draft EA. Comments on the Draft EA were accepted from May 31, 2019 through July 1, 2019 via TVA's website, mail, and e-mail.

TVA received two comment letters from members of the public via TVA's website. The remaining comments received on the draft EA were from the Memphis and Shelby County Port Commission, Tennessee Department of Environment and Conservation (TDEC), and EPA. All comments were carefully reviewed. Appendix A contains the comments on the Draft EA and TVA's responses to those comments.

1.7 Necessary Permits or Licenses

TVA will obtain all necessary permits, licenses, and approvals required for the alternative selected. TVA anticipates the following may be required for implementing the proposed alternatives:

- Air Construction Permit and modification of existing Title V Permit.

- National Pollution Discharge Elimination System (NPDES) Construction Storm Water Permit for stormwater runoff from construction activities. During construction/demolition activities, the City of Memphis can inspect the site to ensure it remains in compliance with the City's stormwater ordinances; however, no additional permitting is required. Additionally, it should be noted in the Stormwater Pollution Prevention Plan (SWPPP) for the site that it is located in the City of Memphis, which is designated as an area that operates a large separate storm sewer system (MS4).
- Permits associated with disposal of sewage and sanitary wastewater into the Memphis Municipal Waste System.
- Aboveground storage tank registrations and permits would require updating, provided the tanks are abandoned or removed.
- Oil Spill Prevention, Control, and Countermeasure Plan or Integrated Pollution Prevention and Spill Response Plan would be updated to reflect the removal of ALF.
- During project demolition activities, TVA would modify the site operational SWPPP as necessary to reflect current site conditions.
- Any work conducted in jurisdictional waters may require a CWA Section 404 permit administered by the U.S. Army Corps of Engineers (USACE) and Section 401 Water Quality Certification administered through an Aquatic Resources Alteration Permit (ARAP) by TDEC depending on the project impacts and location.
- Notification of Demolition (State of Tennessee and/or Shelby County).
- Consistent with the National Flood Insurance Program, the local floodplain administrator would be contacted, when appropriate, to determine the actions necessary to ensure substantive compliance with local floodplain regulations, and thereby minimize adverse impacts to floodplains and their natural and beneficial values.

No permits or licenses would be required specifically for solid or hazardous materials transportation-related activities under any of the potential alternatives with the exception of hauling hazardous materials for the purpose of disposal offsite. The selected contractor would be responsible for ensuring necessary permits are obtained and implemented, manifests completed, and hazardous waste disposal properly reported. Other necessary permits would be evaluated based on site-specific conditions. Additionally, if new hazardous waste streams are generated during demolition, notification and registration of these must be made to TDEC.

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CHAPTER 2 – ALTERNATIVES

2.1 Description of Alternatives

TVA has considered several alternatives for the decontamination and deconstruction of ALF, all of which would affect the proposed decontamination and deconstruction project area shown on Figure 2-1.

Under each action alternative certain buildings will remain at ALF for continued use. These include the following buildings and facilities:

- 161 kilovolt (kV) Switchyard
- Switch House
- Site Security building
- ACT Plant including CT units 1 through 20, oil tanks, CT regulation yard, CT maintenance and control building
- Harsco Metals and Minerals plant, a provider of recycling solutions for industrial byproducts
- Railroad tracks
- Perimeter fencing
- 22-inch buried gas main (belongs to MLGW)
- 12-inch portable water loop (belongs to MLGW)

TVA will determine the status of the following items at a later date:

- Condenser cooling water (CCW) pump house
- CCW discharge outlet tunnel seal well
- Fuel oil unloading station on mooring cell

2.1.1 Alternatives Considered but Eliminated From Further Discussion

TVA considered several options for the disposition of ALF. This section identifies alternatives that TVA considered but rejected from detailed analysis because they did not meet the Purpose and Need of TVA's proposed action or were otherwise unreasonable.

2.1.1.1 Alternative A – Assess, Close, and Secure Units 1, 2, and 3 and Establish an Ongoing Operations and Maintenance Program

The primary objective of Alternative A is to secure and maintain the plant. Under Alternative A, TVA would close and secure ALF by placing it in an “idle and vacant” status during which basic maintenance is continued to minimize environmental and safety risks. All existing

buildings, structures, and equipment within the decontamination and deconstruction boundary shown in Figure 2-1 would remain in place. Retirement, decommissioning, and operations and maintenance activities associated with Alternative A as originally proposed would include the following activities:

- Periodic roof and structural evaluations
- Fire monitoring
- Hazardous Materials Activities:
 - Initial decontamination including abatement of a) asbestos containing materials in poor to fair condition and b) loose and flaking lead-based paint, if any.
 - Periodic hazardous materials condition monitoring.
 - Periodic hazardous materials removal as materials deteriorate over time.
- Electrical Activities:
 - Maintenance of aircraft obstruction lighting required by Federal Aviation Administration regulations at the three existing stacks.
 - Maintenance of select sump pumps to prevent below-grade spaces (basements) from becoming flooded.
 - Monitoring and maintenance of the 4,160 Volt (V) power for the powerhouse electrical needs.

Other activities at ALF, evaluated separately from this project, have resulted in changes that would no longer require monitoring and maintenance of the 4,160 V power for the powerhouse electrical needs. Therefore, Alternative A became very similar in nature to Alternative B.

Additionally, the future economic development of the ALF site would be more limited if the structures are left in place. As such this alternative does not meet one aspect of the purpose and need of the project to promote economic development.

Finally, Alternative A may result in degradation of the facilities over time. As materials deteriorate, there is a potential for release of contaminated materials to the environment. Because this alternative is no longer substantively different from Alternative B and does not meet the purpose and need of the project to make the land available for future economic development, TVA has eliminated Alternative A from further consideration.

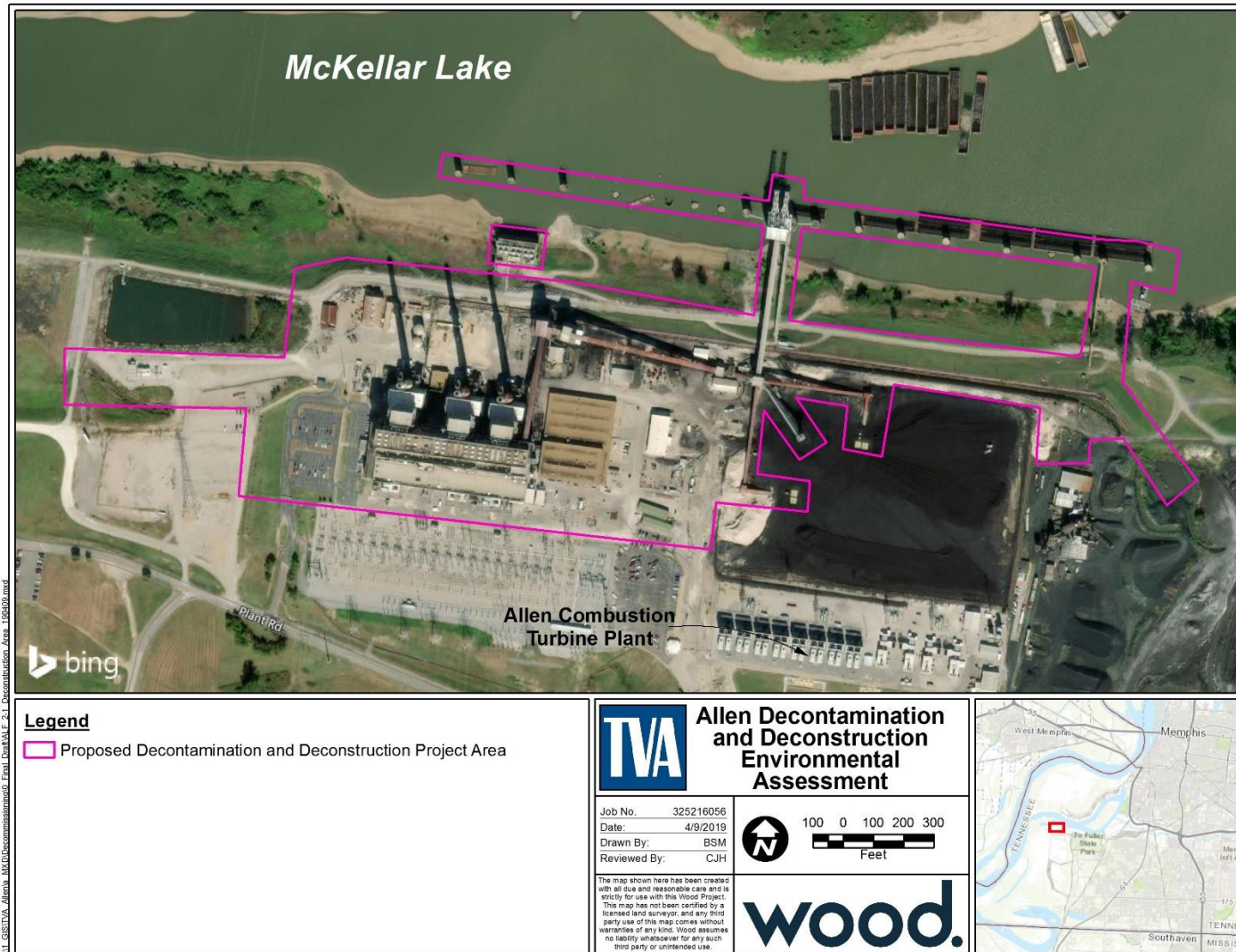


Figure 2-1. Decontamination and Deconstruction Project Area

2.1.1.2 Alternative B – Assess, Close, and Secure Units 1, 2, and 3 with Selective Decontamination of Powerhouse and Related Equipment and Establish an Ongoing Operations and Maintenance Program

The objective of Alternative B is to minimize environmental and safety risks and close and secure the plant. Alternative B includes the retirement, decommissioning, and operations and maintenance activities described under Alternative A with the exception of monitoring and maintenance of the 4,160 V power for the powerhouse electrical needs. In addition to the activities described under Alternative A, there would be additional asbestos containing materials (ACM) and lead-based paint abatement performed in Alternative B.

Future economic development at the site would be more difficult if the structures are left in place. Additionally, as with Alternative A, leaving the structures in place with minimal decontamination could result in degradation of the facilities over time. Therefore, for these economic and environmental considerations, TVA has eliminated Alternative B from further consideration.

2.1.1.3 Alternative C – Selective Demolition of Ancillary Structures and Equipment Exterior to the Main Powerhouse

Alternative C involves the same objectives as Alternative B of reducing environmental and safety risks at the closed plant but would further reduce future maintenance costs and risk by removing outlying buildings. Alternative C would include the decontamination of all buildings, sumps and structures and the retirement, decommissioning, and operations and maintenance activities associated with Alternative B as well as the removal of outlying structures including the ALF Unit 1 through 3 stacks. The main powerhouse and associated structures would remain standing.

As with Alternatives A and B, adoption of this alternative would not meet the purpose and need of the project. Therefore, TVA has eliminated Alternative C from further consideration.

2.1.2 Alternatives Carried Forward for Analysis

This section identifies alternatives that TVA carried forward for more detailed analysis.

2.1.2.1 Alternative D1, D2, and D3 – Full Demolition to Grade Resulting in a Brownfield Site with Stack Removal Options

The objective of all of the Alternative D options is to remove all unneeded structures. All environmental issues associated with identified structures would be assessed and abated, including the decontamination of all buildings, structures, conveyers, and tunnels associated with plant operations, to remove hazardous materials. Alternative D includes the decontamination of all buildings, sumps and structures associated with plant operations to remove hazardous materials and demolishing the powerhouse and all associated structures to 3 feet below final grade resulting in a brownfield site. A brownfield site is defined in the Small Business Liability Relief and Brownfields Revitalization Act as “...real property, the expansion, redevelopment, or reuse of which may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant. Cleaning up and reinvesting in these properties protects the environment, reduces blight, and takes development pressures off greenspaces and working lands” (Public Law 107-118).

Demolition activities under Alternative D would create approximately 17,000 cubic yards of demolition debris and ACM and 69,000 cubic yards of scrap metal that would be hauled

offsite by truck, rail or barge to be recycled or disposed at an appropriate facility in accordance with all federal, state, and local regulations. Scrap metal could also be sold to local or regional vendors. No specific disposal site has been identified at this time and ultimate disposition site selection would be determined by the contractor. If hauled by truck, TVA estimates that offsite transport of this material would be to an existing permitted landfill within 30 miles of ALF. Transport by truck would require the use of up to approximately 15 truckloads (30 truck trips) per day during the 12- to 18-month timeframe for the project. If debris is transported by rail or barge, the material would be loaded onto the barge or rail at the ALF site and would be transported to a landfill or recycling facility. The additional rail traffic and barge traffic would be integrated into the existing systems and once loaded would be delivered to a suitable disposal or recycling facility.

Below-grade building areas would be backfilled with suitable concrete/masonry materials or other suitable clean fill material, and the site would be restored to grade while providing proper drainage. All disturbed areas would have topsoil installed and seeded or otherwise permanently stabilized. Restoration of the site would require the addition of approximately 170,000 cubic yards of borrow material to achieve proposed finished grades and provide a suitable medium to support stabilization of the site. TVA estimates that between 80 to 180 truckloads (up to 360 truck trips per day) would be used to transport borrow to ALF when borrow is needed. Borrow would be obtained from one or more previously developed or permitted commercial borrow site(s) within 30 miles of ALF. No specific site has been identified at this time and ultimate site selection will be left up to the contractor.

Buildings and structures that would be demolished are identified below and shown on Figure 2-2. All structures could be removed via mechanical deconstruction, explosive demolition, or a combination of methods.

- Oil and hazardous waste storage building
- Old and new crusher towers
- Coal reclaim hoppers
- Coal yard offices (Coal Yard Foreman Building and Supervisor Building)
- Coal handling assembly room/control room
- Gilbert, Union Boiler, Morrison Knudsen Maintenance Buildings (2 structures)
- Transformer yard
- Stacks 1 through 3
- Ammonia storage area (ammonia tanks, vaporizer, and control room)
- Hydrogen buildings (2 structures)
- Compressor buildings
- Lighting off oil containment area

- Barge unloader facilities and walkway to barge unloader mooring cell
- Mooring cells (possible demolition)
- Yard equipment maintenance building/coal yard maintenance building
- West contractor entrance building
- Powerhouse (boiler house / turbine bay)
- Electrostatic precipitators
- Selective catalytic reduction systems
- Administration office building
- Maintenance and power stores building/soot-blowing compressor buildings and receiver tank
- Truck scale
- Electrical equipment building
- Water treatment plant
- Demineralized water tanks (2 structures)
- ID fan transformers
- Molten sulfur storage and auxiliary boiler
- Powerhouse (turbine bay)
- Water intake structure (selective demolition)
- Coal barge unloaders, conveyers and transfer stations
- Transfer station
- Fuel oil unloading cells and associated structures (possible demolition)
- Old deionization plant
- Security fencing, except CT and switchyard areas

Scrap metal could be sold to local or regional vendors or disposed at a landfill in accordance with all federal, state, and local regulations. Suitable concrete/masonry would be processed and re-used onsite as backfill. All buried utilities would be severed and properly abandoned in place. Sanitary sewer lines and lift stations would be cleaned as deemed necessary and closed in place. Utilities would be abandoned in place. Manholes and catch basins would be demolished to 3 feet below final grade. The firewater loop,

including hydrants around the switchyard and oil barge unloader would be maintained during demolition and may require cutting/capping to maintain system integrity while isolating from the domestic loop where connected. Electrical activities would include:

- Removal of station startup transformer
- De-energizing of affected electrical power distribution components at all structures to be demolished
- Demolition of equipment and associated conductors and conduit

As a component of decommissioning activities, the cooling water intake and discharge tunnels will be abandoned in place and bulk headed when levels in the Mississippi River are low enough to allow such activities.

Stacks of ALF Units 1 through 3, each 400 feet tall, could be removed via three different methods. These methods comprise sub alternatives within Alternative D. The final method for demolition of the stacks and structures would be determined by the construction contractor at a future date. The sub alternatives are described below.



Figure 2-2. ALF Demolition Sites

2.1.2.1.1 *Alternative D1 - Full Demolition of Units 1, 2 and 3 and Related Structures Resulting in a Brownfield Site, Drop Removal of Stacks and Structures*

Under Alternative D1, stacks of Units 1 through 3 and other structures would be demolished by means of dropping by conventional construction methods. Such methods could include the use of controlled demolition to direct the stacks/structures to fall in a specific direction.

2.1.2.1.2 *Alternative D2 – Full Demolition of Units 1, 2 and 3 and Related Structures Resulting in a Brownfield Site, Mechanical Removal of Stacks and Structures*

Under Alternative D2, stacks of Units 1 through 3 and other structures would be removed via mechanical deconstruction or other controlled methods of deconstruction.

2.1.2.1.3 *Alternative D3 - Full Demolition of Units 1, 2 and 3 and Related Structures Resulting in a Brownfield Site, Hybrid Removal of Stacks and Structures*

Under Alternative D3, stacks of Units 1 through 3 and other structures would be demolished through a combination of mechanical deconstruction or other controlled methods for the upper portions of the stack and conventional controlled demolition for the lower portions.

2.1.2.2 *Alternative E – No Action*

Under the No Action Alternative, TVA would not perform any demolition, deconstruction, decontamination, or other disposition activities at ALF. Consequently, the facility would be left in the “as-is” condition. TVA would continue to restrict access to ALF, perform periodic inspections and critical maintenance as needed, and conduct environmental monitoring and reporting as required. If left in this condition, it likely would present a higher risk than Alternatives D1 through D3 with the potential to contaminate soil and groundwater and increased runoff to surface water as systems and structures degrade. In addition, the No Action Alternative would not make the land available for future economic development of the site. As such, this alternative is not a reasonable alternative. However, being the No Action Alternative, it will be discussed in the EA and used as a basis for comparison to the other alternatives.

2.2 Comparison of Alternatives

The environmental impacts of the alternatives are summarized in Table 2-1. These summaries are derived from the information and analyses provided in Chapter 3.

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

Resource	Alternative D1	Alternative D2	Alternative D3	Alternative E – No Action
Air Quality	Temporary minor impacts from fugitive dust and emissions from equipment and vehicles during decontamination and deconstruction activities and transport of debris and borrow material on public roadways.	Similar but less fugitive dust impacts than Alternative D1 due to mechanical deconstruction of stacks. Duration of impacts would be longer than Alternative D1 but shorter than Alternative D3.	Similar but less fugitive dust impacts than Alternative D1 and more than Alternative D2 due to hybrid deconstruction of the stacks. Duration of impacts would be longer than Alternative D1 but shorter than Alternative D2.	Minor impacts due to potential degradation of structures remaining on site.
Climate Change and Greenhouse Gases	Increased CO ₂ emissions associated with deconstruction and trucking operations would not increase regional greenhouse gas levels and therefore would not contribute to climate change.	Same as Alternative D1.	Same as Alternative D1.	No impact.
Geology and Soils	Minor temporary increase in soil erosion, minimized with BMPs.	Same as Alternative D1.	Same as Alternative D1.	Minor impacts due to potential degradation of structures remaining on site.
Groundwater	Minor temporary impacts during deconstruction. Long-term beneficial impacts associated with removal of potential environmental contamination sources relative to the No Action Alternative.	Same as Alternative D1.	Same as Alternative D1.	Minor impacts due to potential degradation of structures remaining on site.

Resource	Alternative D1	Alternative D2	Alternative D3	Alternative E – No Action
Surface Water Resources	Temporary minor impacts due to potential stormwater runoff during decontamination and deconstruction activities.	Similar but reduced impacts as compared to Alternative D1 due to mechanical deconstruction of stacks.	Similar but reduced impacts as compared to Alternative D1, slightly increased impacts as compared to Alternative D2 due to hybrid deconstruction of the stacks.	Minor impacts due to potential degradation of structures remaining on site.
Aquatic Ecology	Minor impacts to aquatic life during removal of the mooring cells and barge unloader. Minor indirect impacts due to potential stormwater runoff.	Same as Alternative D1.	Same as Alternative D1.	Minor adverse impacts due to potential degradation of structures remaining on site.
Vegetation	Minor temporary adverse impact to common plant communities in laydown areas during deconstruction activities. Minor beneficial impact due to site restoration.	Same as Alternative D1	Same as Alternative D1	No impact.
Wildlife	Minor temporary adverse impact during deconstruction activities. Minor beneficial impact due to site restoration	Same as Alternative D1.	Same as Alternative D.1	No impact.
Threatened and Endangered Species	May affect, but not likely to adversely affect threatened or endangered species.	Same as Alternative D1.	Same as Alternative D1.	No effect on threatened or endangered species.

Resource	Alternative D1	Alternative D2	Alternative D3	Alternative E – No Action
Floodplains	Minor temporary adverse impact during deconstruction activities. Minor beneficial impact due to increased flood storage capacity on McKellar Lake.	Same as Alternative D1.	Same as Alternative D1.	No impact.
Wetlands	No impact.	No impact.	No impact.	No impact.
Visual Resources	Minor temporary adverse impact during deconstruction activities. Long-term beneficial impact associated with removal of stacks and powerhouse.	Same as Alternative D1.	Same as Alternative D1.	Minor adverse impacts due to potential degradation of structures remaining on site.
Cultural and Historic Resources	No effect.	No effect.	No effect.	No effect.
Land Use	Temporary minor impacts due to use of laydown and light use areas during deconstruction activities. No alteration of future land use.	Same as Alternative D1.	Same as Alternative D1.	No impact.
Prime Farmland	No impact.	No impact.	No impact.	No impact.
Transportation	Moderate short term localized adverse impact to traffic movement related to increased traffic accessing ALF during	Same as Alternative D1.	Same as Alternative D1.	No impact.

Resource	Alternative D1	Alternative D2	Alternative D3	Alternative E – No Action
Managed and Natural Areas	construction and restoration activities. Short term, minor adverse impact to birds in the Ensley Bottoms Complex during decontamination and deconstruction activities. Indirect adverse impact to natural areas located along haul routes for debris and borrow material.	Same as Alternative D1.	Same as Alternative D1.	No impact.
Parks and Recreation	Short term and minor impacts to recreational boating, fishing, and bird watching activities during decontamination and deconstruction activities. Short term and minor indirect impact to parks located along haul routes for transport of debris and borrow material.	Same as Alternative D1.	Same as Alternative D1.	No impact.
Noise and Vibration	Short term minor adverse impact related to decontamination and deconstruction activities including the drop removal of stacks. Minor indirect impacts to noise receptors along haul routes for transport	Similar to Alternative D1, but less due to no impacts from blasting used to remove the stacks.	Similar but slightly less than Alternative D1 due to hybrid removal of the stacks.	No impact.

Resource	Alternative D1	Alternative D2	Alternative D3	Alternative E – No Action
	of debris and borrow material.			
Hazardous Materials and Solid and Hazardous Waste	Minor impact as hazardous wastes would be managed in accordance with all applicable state and federal regulations.	Same as Alternative D1.	Same as Alternative D1.	Moderate adverse impacts due to potential degradation of structures remaining on site.
Socioeconomics and Environmental Justice	Temporary and minor beneficial impact during deconstruction activities.	Same as Alternative D1.	Same as Alternative D1.	No impact.
	Short-term minor impact if routes to haul construction debris and /or borrow material utilize surrounding local roadways.	Same as Alternative D1.	Same as Alternative D1.	No impact.
Utilities and Service Systems	Minor localized impact.	Same as Alternative D1.	Same as Alternative D1.	No impact.
Public Health and Safety	Temporary and minor adverse impacts, primarily due to blasting activities to remove the stacks.	Similar to Alternative D1, but reduced impacts due to mechanical deconstruction of stacks.	Similar but slightly less than Alternative D1 due to hybrid removal of the stacks.	Minor, long-term adverse impacts as site would remain in an “as-is” condition.
Cumulative Effects	Moderate impacts to transportation and environmental justice communities due to potential for CCR removal activities to occur concurrently.	Same as Alternative D1.	Same as Alternative D1.	No impact.

2.3 Identification of Mitigation Measures

This section provides a summary of best management practices (BMPs) and mitigation measures that TVA would employ to avoid or reduce adverse impacts from the alternatives analyzed. TVA's analysis of potential impacts includes consideration of BMPs and mitigation implemented as required to reduce or avoid adverse effects. BMPs and mitigation measures are discussed in Chapter 3 and summarized below.

2.3.1 Mitigation Measures

- TVA would use applicable BMPs as described in the project-specific SWPPP and the Tennessee Erosion and Sediment Control Handbook-4th Edition, 2012.
- TVA would minimize one-time emissions of fugitive dust from facilities expected to produce large volumes (such as demolition of the stacks) by working with the demolition contractor on a site-specific plan. The demolition contractor would be required to remove ash from the facilities proposed for deconstruction and demolition, prior to removal of that facility and implement dust control measures during demolition to prevent the spread of dust, dirt, and debris. These methods may include wetting equipment and demolition areas, covering waste or debris piles, using covered containers to haul waste and debris, and wetting unpaved vehicle access routes during hauling. TVA also requires onsite contractors to maintain engines and equipment in good working order.
- TVA will notify Shelby County prior to any demolition activities that have the potential to mobilize dust.
- To minimize the potential for impacts to the interior least tern, TVA would implement certain avoidance measures that are outlined in the Section 7 Endangered Species Act consultation with US Fish and Wildlife Service.
 1. Surveys of the ALF D4 project areas would occur in late April of any given year (for the duration of the project) to identify any exposed ash, gravel, or sand-like substrate that could provide nesting habitat for least terns.
 2. Weekly observations of these potential nesting sites would occur beginning in mid-May and ending in mid-August of any given year (for the duration of the project) to identify any terns that return to the area.
 3. If terns return to the ACC and are seen landing in the ACC gravel lot, the area would be vacated immediately. All personnel, equipment, and vehicles would be removed within a few days and the area would no longer be used again until all terns have left the area or until the end of September when birds are finished nesting, whichever comes first.
 4. If terns return to ALF and are seen nesting in the East Ash Pond, no demolition or loud activities would be permitted within 300 feet of the nests.
 5. If any of measures 1-4 cannot be met, TVA would reinitiate consultation with USFWS.
- TVA would conduct presence/absence surveys at least one month prior to demolition of the structures to determine if migratory birds or listed bat species are utilizing these buildings. If active nests of migratory birds are present and demolition activities must occur within the active nesting season, TVA would coordinate with U.S. Department of Agriculture (USDA) Wildlife Services, who assists with

managing any potential impacts to birds, to determine best options for carrying out demolition activities.

- Borrow would be obtained from one or more previously developed or permitted commercial borrow site(s) within 30 miles of ALF. No specific site has been identified at this time and ultimate site selection would be left up to the contractor. However, TVA would perform all necessary due diligence and consultation as required under Section 106 of the National Historic Preservation Act (NHPA) related to any offsite work.
- To mitigate the potential for impacts to public safety, TVA would restrict or close roads in the vicinity should blasting be used to demolish the stack (Alternatives D1 and D3). No barge or boat traffic would be allowed in the area during the demolition activities. TVA would work with the demolition contractor to create a detailed site-specific plan for any public road closures that would be distributed to affected parties, including emergency personnel.
- If determined necessary, TVA would mitigate traffic impacts by implementing measures such as timing of entry and exit to the facility, establishing alternate ingress/egress routes and possible busing of workers.
- TVA would require the demolition contractor to develop and implement a demolition plan to minimize vibration effects at ALF and in the vicinity. Although seismologic analyses of other recent tall chimney demolitions in the United States suggest that vibrations would not impact nearby structures, if deemed necessary during development of the demolition plan, TVA would use site-specific data to evaluate the potential for vibration impacts on structures within a 0.5-mile radius under Alternatives D1 and D3. The vibration model results would be compared to thresholds developed by the U.S. Bureau of Mines for vibration damage. If indicated by the results, imported fill, dirt binder, and geofabric could be used for mitigation of noise and vibration. Explosives would be managed under the direction of a licensed blaster; 24-hour security would be provided to monitor the explosives. Detailed security plans would be developed. Security details, including any information about the transport and storage of explosives, would be limited to authorized personnel only. Activities would be coordinated with local area emergency response agencies as part of measures that would be taken to mitigate potential impacts on the safety of personnel and the public. Site security on the day of the event would be strictly enforced, and trespassing would not be tolerated. Notifications to the public would be issued prior to the use of explosives for demolition. Prior to the demolition, the area would be prepared, and the explosives contractors would establish a circular fall exclusion zone. During the blast event, no personnel would be allowed in the fall exclusion zone.

- If deconstruction activities have the potential to emit pollutants greater than acceptable thresholds in ALF's existing Title V permit, mitigation may include a request to modify the permit, which would be required for the prevention of significant deterioration of air quality.
- To minimize adverse impacts on natural and beneficial floodplain values, demolition and deconstruction material would be disposed of outside of the 100-year floodplain, and concrete and masonry used as backfill in the floodplain would be placed at-grade or below.

2.3.2 Best Management Practices

- The site-specific demolition plan would include BMPs to control dust leaving the site during any demolition activity, site grading, and transportation of demolition debris, as well as during the removal of hazardous and solid waste. TVA would continue to follow dust control BMPs in accordance with its Title V permit and SWPPP.
- TVA would follow dust control BMPs to reduce fugitive dust emissions from roadways and unpaved areas, such as wet suppression (equipment, demolition areas, and unpaved vehicle access routes during hauling), covering waste or debris piles, and using covered containers to haul waste and debris. TVA also requires onsite contractors to maintain engines and equipment in good working order.
- TVA would take precautions to avoid attracting migratory birds, bats and other wildlife to the area by securing inactive structures that could potentially be used as nesting areas. Any openings in structures would be closed to the extent possible and deterrents may be used. At the time of publication of the Draft EA, no threatened or endangered species were identified within inactive structures. As described in Subsection 2.3.1, TVA would conduct presence/absence surveys prior to demolition of the structures to determine if migratory birds or listed bat species are utilizing these buildings.
- Surface water quality impacts resulting from disturbance during demolition would be minimized by the use of stormwater pollution prevention BMPs to reduce the extent of disturbance and erosion. The Tennessee Erosion and Sediment Control Handbook would be referenced to ensure BMPs to be used during demolition are appropriate (TDEC 2012).
- Potential surface water impacts to any jurisdictional waters during demolition would be minimized or avoided by designing demolition activities to minimize any impacts to adjacent waters. Surface water impacts would be minor with the implementation of BMPs, as well as compliance with the requirements of the USACE and TDEC permitting process. The installation of bulkheads in the tunnels would be conducted in accordance with BMPs intended to avoid release of sediments or contaminants to surface water. BMPs and wastewater treatment would be employed, as needed, to mitigate any pollutant discharge. The implementation of BMPs, protocols to respond to onsite spills prior to discharge, and site clean-up would help to reduce the potential for any releases to surface waters.
- The use of BMPs, including safety procedures and security measures, would minimize potential safety impacts.

- TVA would ensure the proper management of all solid waste and hazardous wastes generated from construction activities in accordance with pertinent federal, state, and local requirements. Additionally, any spills would be managed in accordance with site specific procedures for spill prevention and cleanup.
- Construction debris and wastes would be managed in accordance with federal, state, and local requirements. Prior to demolition activities, hazardous materials will require special removal, handling, and disposal by appropriately trained and licensed personnel and contractors. Best management practices, including dust suppression and environmental controls, would be employed to minimize or prevent releases of hazardous materials.

2.4 The Preferred Alternative

TVA's preferred alternative is Alternative D1, D2, or D3 – Full Demolition to Grade Resulting in a Brownfield Site with Stack Removal Options. Under these alternatives, decontamination of all buildings, sumps and structures associated with plant operations would occur to remove hazardous materials. Additionally, the powerhouse and all associated structures would be demolished to 3-feet below final grade, along with removal of the three 400-foot tall stacks, resulting in a brownfield site. Implementation of this alternative would meet the purpose and need of the project to enhance future economic development in the area and would avoid the potential environmental and public safety impacts associated with leaving ALF in the “as-is” condition.

CHAPTER 3 – AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

3.1 Air Quality and Climate Change

3.1.1 Affected Environment

3.1.1.1 Air Quality

The Clean Air Act regulates the emission of air pollutants and, through its implementing regulations, establishes National Ambient Air Quality Standards (NAAQS) for several “criteria” pollutants that are designed to protect the public health and welfare with an ample margin of safety. The criteria pollutants are ozone, particulate matter, carbon monoxide, nitrogen dioxide, sulfur dioxide, and lead (EPA 2019a).

In accordance with the Clean Air Act Amendments of 1990, all counties are designated with respect to compliance, or degree of noncompliance, with the NAAQS. These designations are either attainment, nonattainment, or unclassifiable. An area with air quality better than the NAAQS is designated as “attainment,” whereas an area with air quality worse than the NAAQS is designated as “non-attainment.” Non-attainment areas are further classified as extreme, severe, serious, moderate, or marginal. An area may be designated as unclassifiable when there is a lack of data to form a basis of attainment status. New or expanded emissions sources located in areas designated as nonattainment for a pollutant are subject to more stringent air permitting requirements (EPA 2019b). ALF is located in Shelby County, Tennessee, which is currently in attainment with all NAAQS (EPA 2018b).

Previously, there were three coal-fired generating units in operation at ALF. As of March 31, 2018, TVA has permanently shut down and retired all of these units. Other permitted air emissions sources, such as the ACT Plant, remain at ALF and will remain operational under all alternatives.

The primary mechanisms for causing potential effects to local air quality considered in this assessment are associated with the demolition of buildings and structures and transportation-related activities. Both activities generate fugitive dust, which is commonly measured by the size of particulate matter. Air quality standards of measure for dust are particulate matter that is less than 10 microns in diameter (PM₁₀) and particulate matter that is less than 2.5 microns in diameter (PM_{2.5}). In addition, exhaust from internal combustion engines used to power trucks and demolition equipment result in emissions that can affect local air quality, particularly if the engines are not properly maintained.

The proposed demolition activities would be subject to federal, state (Tennessee Division of Air Pollution Control), and county (Shelby County) regulations. These regulations impose permitting requirements and specific standards for expected air emissions. The Shelby County Air Pollution Control Branch administers the construction/operating air quality permit program, performs facility inspections and air pollution testing, collects and disseminates air pollution information, and enforces violations of the air regulations in Shelby County.

3.1.1.2 Climate Change

“Climate change” refers to any substantive change in measures of climate, such as temperature, precipitation, or wind lasting for an extended period (decades or longer) (EPA

2016). The 2017 National Climate Assessment concluded that global climate is projected to continue to change over this century and beyond (USGCRP 2017). Annual average temperature over the contiguous United States has increased by 1.8°F (1.0°C) for the period 1901–2016. Over the next few decades (2021–2050) and under all future climate scenarios evaluated, annual average temperatures are expected to rise by about 2.5°F for the United States relative to the recent past (average from 1976–2005) (USGRP 2017).

Climate change is primarily a function of excessive carbon dioxide (CO₂) in the atmosphere. CO₂ is the primary greenhouse gas emitted through human activities. Activities associated with the proposed action that produce CO₂ are primarily related to emissions from fossil-fuel-powered equipment (e.g., bulldozers, loaders, haulers, trucks, generators) used during the proposed activities. Forested areas that absorb and store CO₂ from the atmosphere via a process known as carbon sequestration help to reduce levels of CO₂ in the atmosphere. No forested areas will be directly or indirectly impacted under any of the proposed alternatives.

Additional greenhouse gases that contribute to climate change include hydrofluorocarbons used in refrigeration equipment; sulfur hexafluoride used as a gaseous dielectric medium for high-voltage (1-kV and above) circuit breakers, switchgears, and other electrical equipment; and methane. These gases can be released to the atmosphere through seal leaks, especially from older equipment, as well as during equipment manufacturing, installation, servicing, and disposal (U.S. Department of Energy 2006).

3.1.2 Environmental Consequences

3.1.2.1 Alternative D1 – Full Demolition of Units 1, 2 and 3 and Related Structures Resulting in a Brownfield Site, Drop Removal of Stacks and Structures

Under Alternative D1, short term, direct contaminant and greenhouse gas emissions would occur due to the generation of fugitive dust and use of vehicles and equipment in the demolition process and transport of demolition debris and borrow material.

EPA determined estimates of emissions from construction sites are based on particles less than roughly 30 microns which is the effective cut-off size for the capture of construction dust by a standard high-volume filtration sampler (EPA 1995). Based on the EPA analysis, fugitive particulate emissions from demolition activities typically produce particles that are primarily deposited on the property where the structures being demolished are located. The potential drift distance of particles is governed by the initial injection height of the particle, the terminal settling velocity of the particle, and the degree of atmospheric turbulence. Theoretical drift distance, as a function of particle diameter and mean wind speed, has been computed for fugitive dust emissions. Results indicate that, for a typical mean wind speed of 10 miles per hour, particles larger than about 100 microns are likely to settle out within 20 to 30 feet from the point of emission. Particles that are 30 to 100 microns in diameter are likely to settle within a few hundred feet from the point of emission. Smaller particles, particularly PM₁₀ and PM_{2.5}, have much slower gravitational settling velocities and are much more likely to have their settling rate retarded by atmospheric turbulence, and thus be transported offsite (EPA 1995). Direct emissions of fugitive dusts would be generated by general demolition activities, but these emissions would be temporary, and the majority of particulate matter would settle within the immediate vicinity of ALF. The closest residences to the decontamination and deconstruction project area are located approximately 1.5 miles southeast of the project area, and T.O. Fuller State Park is located approximately 0.6 miles southeast of the project area. Given the distance from the plant,

these receptors would not be impacted by fugitive dust emissions. Under Alternative D1, there would also be an intense, short term release of fugitive dust associated with the removal of the stacks or structures by dropping with explosives. Fugitive dust would be released in an uncontrolled manner and would likely be released within a span of minutes, after which these emissions would cease. Dropping the stacks or structures via explosives would likely produce the most particulate matter of any site activity, with the highest potential to travel off the demolition site.

To minimize potential fugitive dust mobilization associated with explosive demolition of stacks or structures, the demolition contractor would be required to remove ash from the facilities proposed for deconstruction and demolition, prior to removal of that facility and implement dust control measures during demolition to prevent the spread of dust, dirt, and debris. These methods may include wetting equipment and demolition areas, covering waste or debris piles, using covered containers to haul waste and debris, and wetting unpaved vehicle access routes during hauling. TVA also requires onsite contractors to maintain engines and equipment in good working order.

Site preparation and vehicular traffic over paved and unpaved roads at the site would result in the emission of fugitive dust during active deconstruction, demolition debris removal, and restoration activities. The largest fraction of fugitive dust emissions would be deposited onsite within the demolition site boundaries. If necessary, emissions from open demolition areas and paved/unpaved roads could be mitigated by spraying water on the roadways to reduce fugitive dust emissions.

Combustion of gasoline and diesel fuels by internal combustion engines (vehicles, generators, demolition equipment, etc.) would generate local emissions of particulate matter, carbon monoxide, nitrogen dioxide, sulfur dioxide, volatile organic compounds, and CO₂, during the site preparation, demolition, and restoration periods. However, new emission control technologies and fuel mixtures have significantly reduced vehicle and equipment emissions. Additionally, it is expected that all vehicles would be properly maintained, which would also reduce emissions.

Demolition debris and any scrap metal would be transported to an offsite vendor, landfill, or recycling facility by truck, rail or barge. Transport of these materials would result in increased emissions for a period of up to 18 months. The transport of demolition debris and scrap metal by truck during decontamination and deconstruction activities would require the use of up to 15 truckloads (30 truck trips) per day to transport the material offsite. The materials would be transported along existing roadways in the vicinity of ALF for a period of approximately 18 months. In addition, the need for borrow material for site restoration would require the transport of approximately 80 to 180 truckloads (up to 360 truck trips) per day of borrow from a previously developed or permitted borrow site within 30 miles of ALF. The borrow would be intermittently transported along existing roadways during the site restoration period of approximately 12 months. The total amount of air emissions associated with this vehicular traffic would be temporary and minor in comparison to traffic in the region and would not adversely affect local air quality. Mitigation measures including implementing BMPs for controlling fugitive dust and proper maintenance of vehicles for controlling emissions would further reduce impacts.

Given the expected capacity of a train or river barge, air emissions from these modes of transport would be minor, temporary and regionally distributed and would not adversely impact regional air quality.

The use of vehicles and demolition equipment in the activities associated with Alternative D1 including offsite vehicle operations (such as debris disposal, the transport of borrow, and workforce transportation) would result in a minor temporary increase in CO₂ emissions. There would also be a small risk of a release of pollutants and/or greenhouse gases associated with handling and removal of refrigeration and electrical equipment during deconstruction and demolition activities. Such emission levels are expected to be *de minimis* in comparison to the regional and world-wide volumes of greenhouse gases. Therefore, local and regional greenhouse gas levels would not be adversely impacted by emissions from demolition activities.

Overall, Alternative D1 is expected to have a minor and temporary impact on air quality and no direct or indirect impact on regional climate change.

3.1.2.2 Alternative D2 – Full Demolition of Units 1, 2 and 3 and Related Structures Resulting in a Brownfield Site, Mechanical Removal of Stacks and Structures

Under Alternative D2, air quality and climate change impacts from all demolition activities, excluding air emissions associated with removal of the stacks, would be the same as under Alternative D1.

Under Alternative D2, emissions of fugitive dust associated with removal of the stacks or structures by controlled mechanical methods would be similar, but less than Alternative D1 as there would be no intense, short term emissions associated with uncontrolled dropping of the stacks. Emissions would occur from the use of hand-held power tools, equipment used to transport debris to waiting trucks, trucks used to haul debris and borrow material, and worker vehicles. The duration of these emissions would be slightly longer than that associated with Alternative D1, because the length of time required to accomplish demolition would be greater. Overall, Alternative D2 is expected to have a minor and temporary impact on air quality and no direct or indirect impact on regional climate change.

3.1.2.3 Alternative D3 – Full Demolition of Units 1, 2 and 3 and Related Structures Resulting in a Brownfield Site, Hybrid Removal of Stacks and Structures

Under Alternative D3, air quality and climate change impacts from all demolition activities, excluding air emissions associated with removal of the stacks, would be the same as under Alternative D1.

However, under Alternative D3, emissions of fugitive dust associated with removal of the stacks or structures by hybrid methods would be relatively greater than those of Alternative D2, but less than those associated with Alternative D1. There may be multiple episodes of short term emissions associated with uncontrolled dropping of portions of the stacks, but none of these would be as intense as the full dropping of the stacks under Alternative D1. Emissions would also occur from the use of handheld power tools, equipment used to transport debris to waiting trucks, trucks used to haul debris and borrow material, and worker vehicles. The duration of these emissions is expected to be longer than that associated with Alternative D1, but shorter than that associated with Alternative D2. Alternative D3 is expected to have a minor and temporary impact on air quality and no direct or indirect impact on regional climate change.

3.1.2.4 Alternative E – No Action

Under the No Action Alternative, TVA would not perform any decontamination, deconstruction or other disposition activities and the site would remain in its current

condition. There would be no impacts to air quality or climate change associated with demolition activities or transport of demolition debris and borrow material. The only active source of emissions that would remain at ALF would be the ACT facility and the activities associated with its continued operation.

Over the long-term, indirect adverse impacts to air quality could occur due to the release of petroleum fuels, volatile organic compounds, hydrofluorocarbons, or other contaminants from leftover equipment within the ALF site. Sulfur hexafluoride could be released from electrical equipment. If such releases occur, they would be limited to the amount of gas in a specific container and would be expected to be negligible. The deterioration of hazardous materials not removed from the facility such as asbestos, lead paint, and dust could also result in the release of contaminants to the air. These would be limited to the amount of hazardous material remaining at the facility, would likely occur slowly over time due to degradation, and would be expected to be negligible. Overall, impacts to air quality as a result of Alternative E would be minor and would have no impact on regional climate change.

3.2 Geology and Soils

3.2.1 Affected Environment

3.2.1.1 Geologic Setting

ALF is located on top of the Mississippi Embayment, in the Mississippi Alluvial Plain section of the Gulf Coast Coastal Plain. The Mississippi embayment is a geologic basin filled with 3,000 feet or more of Cretaceous to Recent age sediments deposited primarily in a Coastal Plain setting. The sedimentary sequence is dominated by unconsolidated sand, silt, and clay with minor lignite (Hosman and Weiss 1991). The plant and surrounding areas are underlain by artificial fill and Quaternary age alluvial deposits (Stantec 2019). The fill generally consists of alluvium dredged from McKellar Lake, materials from cut and fill excavations from the surrounding floodplain, and possibly loess in select locations (Hosman and Weiss 1991). The alluvium consists of irregular lenses of fine sand, silt, and clay in the upper part and coarse sands, gravelly sands, and sandy gravels in the lower part. The alluvium varies in thickness from about a few feet in some areas to 45 feet to 90 feet adjacent to the loess bluffs to as much as 175 feet in the floodplain. The alluvium is underlain by a series of highly consolidated clays and dense sands of the Claiborne Group (Hardeman et al. 1966).

According to the Natural Resources Conservation Service (NRCS) web soil survey (USDA NRCS 2019a), most of the soils in the decontamination and deconstruction project area and adjacent laydown areas are mapped as filled land. Soils in the laydown areas also include Commerce silt loam and Robinsonville fine sandy loam.

3.2.1.2 Geologic Hazards

3.2.1.2.1 Karst Topography

“Karst” refers to a type of topography that is formed when rocks with a high carbonate content, such as limestone and dolomite, are dissolved by groundwater to form sink holes, caves, springs and underground drainage systems. Karst topography forms in areas where limestone and dolomite are near the surface. Due to the lack of carbonate rocks in the region, it is unlikely that karst conditions exist at the site. Furthermore, no evidence of a karst environment near or at the facility has been found in published literature.

3.2.1.2.2 Seismic Events

ALF is located on the southeast edge of the New Madrid Seismic Zone of the central Mississippi Valley. This zone is considered to have high seismic hazard, based on multiple historical records (early 1800s) of earthquakes ranging up to a magnitude of 7 to 8 on the Richter scale. However, ALF is located at the edge of the zone where the seismic hazard is considered to be moderate (Stantec 2009).

3.2.2 Environmental Consequences

3.2.2.1 Alternative D1 – Full Demolition of Units 1, 2 and 3 and Related Structures Resulting in a Brownfield Site, Drop Removal of Stacks and Structures

Under Alternative D1, all identified aboveground structures would be deconstructed to a depth of approximately 3 feet below ground. The stacks and some structures would be demolished by conventional construction methods that may include controlled demolitions. All below-grade building areas would be backfilled and the site would be restored to grade while providing proper drainage. All disturbed areas would have topsoil installed and seeded or otherwise stabilized. Grading and construction activities have the potential to disturb soil stability and increase erosion. Despite these proposed actions, impacts to soil resources associated with surface disturbances related to the proposed deconstruction activities are expected to be minor, as BMPs described in The Tennessee Erosion and Sediment Control Handbook (TDEC 2012), and outlined in the project-specific SWPPP would be implemented to minimize erosion during clearing and site preparation.

Removal of the stacks and structures would result in vibrations at the surface in the immediate vicinity when they are felled. Additional vibrations would be generated throughout the course of deconstruction of the buildings and grading and backfilling of the facility. It is expected that such vibrations would be relatively localized and temporary. No earth-moving or clearing is anticipated within the laydown areas. Therefore, there would be no impacts to geology or soils.

3.2.2.2 Alternative D2 – Full Demolition of Units 1, 2 and 3 and Related Structures Resulting in a Brownfield Site, Mechanical Removal of Stacks and Structures

Under Alternative D2, aboveground stacks and structures would be removed through deconstruction. This would result in minor vibrations at the surface during deconstruction of the stacks and structures and grading and backfilling of the facility. Impacts would be similar to those described above under Alternative D1 except, levels of vibration associated with removal of the stacks and structures by controlled mechanical methods would be significantly lower than the drop removal using explosives in Alternative D1. However, as vibrations would be relatively localized and temporary there would be no impacts to geology and soils.

3.2.2.3 Alternative D3 – Full Demolition of Units 1, 2 and 3 and Related Structures Resulting in a Brownfield Site, Hybrid Removal of Stacks and Structures

Impacts would be the same to those described above for Alternative D1. Hybrid removal of the stacks and structures would not have any additional effect on geology or soils.

3.2.2.4 Alternative E – No Action

No demolition or construction would occur under Alternative E. Under the No Action Alternative, there would be a higher potential for long-term impacts to soils because of the

higher risk of contamination as the structures degrade, without any periodic inspections and maintenance. Overall, the potential impacts of this alternative on geology would be minor, but greater than the other alternatives.

3.3 Groundwater

3.3.1 Affected Environment

3.3.1.1 Regional Aquifers

The principal aquifers of the region include (in descending order): Alluvial aquifer, the Memphis Aquifer (also known as the Memphis Sand Aquifer), and the Fort Pillow Sand. The materials constituting the Alluvial aquifer range in size from coarse gravel to clay. They commonly grade downward from fine sand, silt, and clay at the top, to coarse sand or gravel at the base. The thickness of the alluvium may vary significantly over very short distances (Hosman and Weiss 1991; Brahana and Broshears 2001). Recharge occurs primarily by surface infiltration of rainfall. The alluvium is not a major groundwater source in the Memphis area, even though it is a major water-bearing zone and can supply large quantities of water to wells. This lack of use is related to its limited area of occurrence and to the hardness and high iron concentration of the water (Brahana and Broshears 2001).

These alluvial deposits are composed of a fine- to medium-grained silty sand with intervals of fine-grained silts and clays in the upper portion of the unit and fine- to coarse-grained sand with trace fine- to coarse-grained gravel in the lower portion. The alluvial deposits are underlain by the fine-grained Cook Mountain Formation (hydrogeologically referred to as the upper Claiborne confining unit in this location). The Cook Mountain Formation is underlain by the Memphis Aquifer, which is characterized by predominantly very fine- to very coarse-grained sand with lenses of fine-grained material and is referred to as the Memphis Aquifer (Stantec 2018).

There are no known public water supply wells completed in the alluvial aquifer within at least one mile of ALF (Shelby County Health Department 2016). Two industrial wells, however, are located within one mile that are associated with the Harsco Metal and Minerals industrial water use. A series of four additional wells have been established by TVA in conjunction with the ACC Plant. These wells, however, are being maintained in a non-operational mode as TVA currently purchases water from MLGW to obtain cooling water for the ACC plant.

Monitoring wells installed around the East Ash Impoundment indicate groundwater movement in the alluvial aquifer immediately beneath the site is generally northward to McKellar Lake. Depth to groundwater is generally 10 to 30 feet below ground surface and seasonally fluctuates with lake levels (Stantec 2018).

The Memphis Aquifer is a major regional aquifer and is the source of municipal water for the City of Memphis. The aquifer primarily consists of fine-to-coarse sand with isolated lenses of clay and silt. In Shelby County, the coarsest sand commonly occurs in the upper one-third of the Memphis Sand, which ranges in thickness from approximately 700 to 900 feet (Parks and Carmichael 1990). Based on regional geologic cross sections, the Memphis Aquifer is expected to occur at a depth of at least 250 to 300 feet below ground surface in the vicinity of the ALF (Key Environmental 2013). The Memphis Aquifer is separated from the underlying Fort Pillow aquifer by 0 to 310 feet of clay, silt, and sand sediments of the Flour Island aquitard. The Fort Pillow aquifer is not widely used in the Memphis region

because of the availability of shallower groundwater resources (Brahana and Broshears 2001).

3.3.1.2 Groundwater Monitoring

Sampling events performed subsequent to 2016 have exhibited elevated levels of several constituents above the maximum contaminant levels (MCLs) in water samples taken from the downgradient groundwater monitoring wells around the East Ash Pond Complex at ALF. TVA, under the oversight of TDEC, has been conducting a remedial investigation into the nature and extent of the contamination. TVA will continue to collect groundwater samples from existing monitoring wells and review the analytical results as a part of TDEC Commissioner's Order No. OGC15-0177, the EPA's Final Disposal of Coal Combustion Residuals from Electric Utilities rule (CCR Rule), and other regulatory requirements.

3.3.2 Environmental Consequences

3.3.2.1 Alternative D1 – Full Demolition of Units 1, 2 and 3 and Related Structures Resulting in a Brownfield Site, Drop Removal of Stacks and Structures

Construction activities associated with decontamination and demolition at ALF have the potential to release constituents that may impact shallow groundwater, though would not be expected to impact the deeper Memphis Sands Aquifer. In the long-term, potential environmental contamination sources associated with the buildings and structures at ALF would be removed through the decontamination and demolition activities at ALF. Deconstruction and demolition would therefore limit the potential for contamination of groundwater from these sources and would have a positive impact on groundwater quality relative to the No Action Alternative. Additionally, demolition and environmental abatement would be conducted in accordance with any applicable environmental and safety regulations, minimizing the potential for a release of contaminants. Therefore, the impact to groundwater associated with the actions under this alternative would be minor.

3.3.2.2 Alternative D2 – Full Demolition of Units 1, 2 and 3 and Related Structures Resulting in a Brownfield Site, Mechanical Removal of Stacks and Structures

Impacts would be similar to those described above for Alternative D1. Controlled removal of the stacks and structures would not have any additional effect on groundwater.

3.3.2.3 Alternative D3 – Full Demolition of Units 1, 2 and 3 and Related Structures Resulting in a Brownfield Site, Hybrid Removal of Stacks and Structures

Impacts would be similar to those described above for Alternative D1. Hybrid removal of the stacks and structures would not have any additional effect on groundwater.

3.3.2.4 Alternative E – No Action

All structures would remain in place and, therefore, there would be a higher potential for long-term impacts to groundwater quality because of the higher risk of contamination as the structures degrade. Overall, the potential impacts of this alternative on groundwater would be minor, but they would be greater than those under Alternatives D1, D2 and D3.

3.4 Surface Water Resources

3.4.1 Affected Environment

The proposed decontamination and deconstruction project area is located within the McKellar Lake surface water system. McKellar Lake was created around 1950 when the Tennessee Chute (the Mississippi River side channel flowing around the eastern side of Presidents Island) was blocked by an earthen embankment at the upstream end (Lauderdale 2011). The embankment supports the Jack Carley Causeway, which provides access to the industrial area developed on the island. A separate smaller island, Treasure Island, is located within McKellar Lake. McKellar Lake is a 6.6-mile long, 1,550-acre water body that is connected to the Mississippi River (excluding Treasure Island) (TVA 2014).

The hydrodynamics of McKellar Lake are important for water quality conditions in the lake as it controls mixing and flushing. The hydrodynamic conditions are complex as they are influenced by watershed runoff inflow and river stage changes. River stage changes, and therefore McKellar Lake stages, span a range of greater than 50 feet from low stage to flood stage.

Four laydown facilities are proposed as part of the project and are shown in Figure 1-2. There are no known surface water resources located in these laydown areas.

3.4.1.1 Surface Water Quality

ALF is located in-between two 8-digit hydrologic units (HUC), the Lower Mississippi-Memphis (08010100) and the Nonconnah Creek Basin (HUC 08010211) watersheds. However, the majority of the ALF facilities' permitted discharges go to McKellar Lake, within the HUC 08010100. McKellar Lake is designated for industrial waste supply, fish and aquatic life, recreation and navigation designated uses (TDEC 2013). There are water quality concerns in many of the stream segments in both watersheds. Fish consumption advisories have been issued for McKellar Lake, Mississippi River and Nonconnah Creek upstream from McKellar Lake with chlordane, other organics and mercury listed as the pollutants (TDEC 2018a).

The federal Clean Water Act requires all states to identify all waters where required pollution controls are not sufficient to attain or maintain applicable water quality standards and to establish priorities for the development of limits based on the severity of the pollution and the sensitivity of the established uses of those waters. States are required to submit reports to the EPA. The term "303(d) list" refers to the list of impaired and threatened streams and water bodies identified by the state. McKellar Lake is listed on the TDEC 303(d) list for PCBs, dioxins, *Escherichia Coli* (*E. Coli*), and chlordane from contaminated sediments. It is also listed for *E. Coli*, low dissolved oxygen, Nitrate + Nitrite, and sedimentation/siltation from sanitary sewer overflows and discharges from MS4s. Mercury is also listed due to atmospheric deposition. The nearby Mississippi River and the Horn Lake cutoff are generally listed for similar pollutants from similar sources (TDEC 2018b). TDEC also identified the total maximum daily load (TMDL) priority for all pollutants for McKellar Lake as low priority (TDEC 2018b).

ALF has a number of permitted outfalls that include Outfall 001 (East Ash Impoundment), Outfall 002 (Inactive West Ash Impoundment), and Outfall 003 (Condenser Cooling Water). The surface water limits and regulatory requirements of these outfalls are detailed in the TDEC NPDES Permit No. TN0005355 (TDEC 2008). Additionally, storm water discharges

are authorized by the Tennessee Multi-Sector General Permit No. TNR053184. Until recently, most process flows from the plant were channeled to the East Ash Impoundment including, but not limited to, powerhouse roof, floor and yard drainage, main station sumps (also known as floor drain sumps), coal pile runoff, wash waters, car wash drains, ACC site runoff and process discharges, reverse osmosis discharges and direct precipitation. These flows have been rerouted away from the East Ash Impoundment to meet requirements of the CCR Rule. Because ALF is no longer generating power, most process flows, including sluice water and Harsco Metals and Minerals processing discharges are also no longer being generated. While generating, the average discharge flow from Outfall 001 over the production year (2016-2017) was 11.16 million gallons per day (MGD) based on discharge data collected per NPDES reporting. However, now that the Fossil portion of the site is no longer generating, all process water flows have either ceased or are being discharged to the Memphis Municipal Waste System. Storm water flows have been diverted to Tennessee Multi-Sector General Permit (TMSP) Outfalls and only precipitation driven flows are being discharged from Outfall 001, which has decreased discharge flows to less than 2 MGD.

The ALF NPDES permit requires monitoring at Outfall 001 of flow, total ammonia as nitrogen, total copper, total iron, total lead, total mercury, total manganese, total selenium, total silver, total cadmium, total chromium, and acute toxicity. The NPDES permit also has established limitations on pH (range from 6-9 standard unit); total suspended solids (average monthly concentration 30.0 milligrams per liter (mg/L), and daily max 100.0 mg/L); and oil and grease (average monthly concentration 15.0 mg/L, and daily max 20.0 mg/L).

3.4.2 Environmental Consequences

3.4.2.1 Alternative D1 – Full Demolition of Units 1, 2 and 3 and Related Structures Resulting in a Brownfield Site, Drop Removal of Stacks and Structures

Under Alternative D1, all designated buildings and structures would be decontaminated to remove hazardous materials prior to demolition. All buildings and equipment would be demolished and backfilled to grade, resulting in a brownfield site. The intake and discharge channels would be sealed off and all equipment removed. In addition, environmental issues would be abated, and basements, trenches, and pits would be backfilled to grade. All disturbed areas would be covered with topsoil and seeded or otherwise permanently stabilized. The main network of sewers that serve the ACT units, transmission facilities, water treatment plant, and other remaining buildings would remain. Surface water runoff to the surface impoundments and Coal Yard Runoff Pond has been rerouted to construction storm water outfalls or TMSP permitted outfalls per CCR Rule requirements. Under Alternative D1, stacks and certain structures would be demolished by means of explosive dropping by conventional construction methods. Wastewaters generated during the implementation of Alternative D1 may include construction storm water runoff, dewatering of work areas, domestic sewage, non-detergent equipment washings, dust control, and hydrostatic test discharges.

3.4.2.1.1 Surface Runoff During Demolition

Demolition activities have the potential to temporarily affect surface water quality via storm water runoff. TVA would obtain coverage under the General Permit for Storm Water Discharges Associated with Construction Activities (TDEC 2016) prior to beginning demolition. This permit requires the development of a project-specific SWPPP. During construction/demolition activities, the City of Memphis can inspect the site to ensure it remains in compliance with the City's stormwater ordinances; however, no additional

permitting is required. Additionally, it should be noted in the SWPPP that the site is located in an MS4 area. Surface water quality impacts resulting from disturbance during demolition would be mitigated by the use of storm water pollution prevention BMPs to minimize the extent of disturbance and erosion. The Tennessee Erosion and Sediment Control Handbook would be referenced to ensure BMPs to be used during demolition are appropriate (TDEC 2012). Storm water would discharge either to the TMSP permitted discharge points or designated construction storm water outfalls. BMPs would be installed, inspected, and maintained for the duration of demolition as needed to avoid contamination of surface water adjacent to the proposed decontamination and deconstruction project area. All proposed project activities would be conducted in a manner to ensure that waste materials are contained, and the introduction of pollution materials to the receiving waters would be minimized. Equipment washing and dust control discharges would be handled in accordance with BMPs described in the SWPPP for water-only cleaning, and/or NPDES Permit TN0005355 (TDEC 2008). Monitoring of current industrial storm water outfalls would continue throughout the demolition process, with modifications as directed by the SWPPP. Therefore, only temporary, minor impacts to surface water quality would be expected due to surface water runoff from the demolition site.

Any work conducted in jurisdictional waters, such as the mooring cell removal work and barge unloader removal, could trigger permitting requirements under the CWA. Actions may require a Section 404 permit administered by the USACE and Section 401 Water Quality Certification administered by TDEC through the ARAP permitting program depending on the project impacts and location. Potential surface water impacts during demolition in these areas would be avoided by designing demolition activities to minimize any impacts to adjacent waters. Mitigation measures, such as turbidity curtains in adjacent waters, would be considered to help mitigate any incidental discharge of fill to receiving streams. With the implementation of BMPs, as well as compliance with the requirements of the USACE and TDEC permitting programs, impacts to surface water would be minor. In the event CWA permits are required, any applicable compensatory mitigation for impacts to streams would be identified through the permitting process.

Portable toilets would be provided for the additional construction workforce as needed. These toilets would be pumped out regularly, and the sewage would be transported by tanker truck to a publicly-owned wastewater treatment works that accepts pump out. There would be no discharge to adjacent surface water, and therefore no impacts to surface water quality.

Alternative D1 would potentially release fugitive dust, fill, and residual ash to adjacent surface water during demolition, due to the uncontrolled nature of the dropping of the stack in a single, brief action. This action would result in the generation of fugitive dust and debris, which would then be subject to potential erosion and transport to adjacent surface water. BMPs to control and minimize fugitive dust would be described in the project's SWPPP.

Once decontamination and deconstruction are completed and deconstructed areas are restored, impacts associated with deconstruction activities and storm water runoff would cease. With the implementation of appropriate BMPs and compliance with all federal, state, and local regulations and guidelines, only temporary, minor impacts to surrounding surface waters are expected from deconstruction and demolition activities.

3.4.2.1.2 Sealing of Cooling Water Intake and Discharge

The installation of bulkheads in the tunnels would occur entirely within the tunnels and would be conducted in accordance with BMPs intended to avoid release of sediments or contaminants to surface water. The installation process would not be expected to cause adverse impacts to surface water quality as long as the proper BMPs were utilized. If hydrostatic testing of the bulkheads is required, the resultant discharges would be managed in accordance with NPDES Permit TN0005355 or the TDEC General NPDES Permit for Discharges of Hydrostatic Test Water (TN670000).

3.4.2.1.3 Storm Water and Process Wastewater

Demolition of the facility would result in a change in management of the onsite storm water and process wastewater. With the coal-fired units no longer in operation, the only significant remaining flows at ALF would be storm water flows and some ancillary process water flows, like sump discharges. In order to comply with the CCR Rule, which requires that the CCR units no longer accept flows after April 2019, all process water flows are currently being sent to the Memphis Municipal Waste System, requiring a pre-treatment permit for treatment. Storm water would continue to be discharged from current or new TMSP permitted storm water outfalls or would be discharged out of construction storm water outfalls. As at present, only rain water that would actually fall onto the ponds would be discharged from the onsite CCR ponds. BMPs and mitigation measures would be employed, as needed, to mitigate any adverse pollutant discharges. The specific characteristics of future discharges are unknown at this time. However, the total loadings to McKellar Lake should decrease significantly from previous generating conditions, which would lead to beneficial impacts.

There would be no ongoing potential for direct discharges of chemicals, hazardous waste, or solid waste, because all equipment, structures, and contaminated soil would be removed from the decontamination and deconstruction area. There would be no requirement for periodic inspections, maintenance, or BMPs to ensure that any contaminated equipment would not impact surface water quality.

With the use of proper BMPs and compliance with all federal, state, and local regulations and guidelines, surface water impacts associated with Alternative D1 would be expected to be short term and minor.

3.4.2.2 Alternative D2 – Full Demolition of Units 1, 2 and 3 and Related Structures Resulting in a Brownfield Site, Mechanical Removal of Stacks and Structures

Under Alternative D2, the stacks and structures would be removed via mechanical deconstruction or other controlled method of deconstruction. The scope of Alternative D2 would be the same as that of Alternative D1, except that the stacks would be removed using mechanical removal methods. The type and volume of wastewaters associated with the implementation of Alternative D2 would be the same as those for Alternative D1, and would include construction storm water runoff, dewatering of work areas, domestic sewage, non-detergent equipment washings, dust control, and hydrostatic test discharges.

The types of impacts to surface water from demolition would be the same as described for Alternative D1, however, Alternative D2 would have the lowest potential for the release of fugitive dust, fill, and residual ash to adjacent surface water during demolition because the stacks and structures would be removed in a controlled manner using mechanical or other controlled methods. The use of mechanical removal would minimize the generation of

fugitive dust and debris, thus minimizing the potential erosion and transport of these materials to adjacent surface water.

Therefore, impact to surface water would be the similar, yet somewhat less than Alternative D1. With the use of proper BMPs and compliance with all federal, state, and local regulations and guidelines, surface water impacts associated with Alternative D2 would be expected to be short term and minor.

3.4.2.3 Alternative D3 – Full Demolition of Units 1, 2 and 3 and Related Structures Resulting in a Brownfield Site, Hybrid Removal of Stacks and Structures

Under Alternative D3, the stacks and structures would be demolished through a combination of mechanical deconstruction or other controlled methods for the upper portions of the stacks and conventional controlled demolition for the lower portions. Under Alternative D3, impacts to surface water resources would be similar, yet somewhat less than those described for Alternative D1 and would be short term and minor.

3.4.2.4 Alternative E – No Action

Under the No Action Alternative, it is assumed that TVA would be required to continue operating some sumps and storm water systems at the retired facility. TVA would continue to restrict access to ALF, perform periodic inspections and critical maintenance as needed, and conduct environmental monitoring and reporting as required. Leaving the facility in place would present a higher risk of impacts to surface water than Alternatives D1 through D3 based on the potential for unpermitted releases of sediment, chemicals, and solid waste.

Permits would continue to be renewed with applicable monitoring requirements included. Permits and associated pollution prevention plans would be modified to indicate the changes from current conditions. The scope of this document does not include the long-term management of the onsite surface water impoundments. Discharge of the sumps and storm water have been rerouted away from the impoundments to ensure these discharges are still appropriately handled through the TDEC NPDES permit program regardless of the future status of the impoundments. Minor impacts are anticipated with this alternative as long as facilities are maintained.

3.5 Aquatic Ecology

3.5.1 Affected Environment

ALF is located southwest of downtown Memphis, Tennessee just 1.8 miles east of the Mississippi River (River Mile 725). The plant lies in the river floodplain along the southern shore of McKellar Lake, an oxbow lake that is connected to the Mississippi River. Most of the decontamination and deconstruction project area, laydown areas, and light use area are located behind USACE levees on the southern side of McKellar Lake. However, the intake and discharge tunnels, barge unloader, mooring cells and conveyors, and fuel unloading cell and associated structures are located within the lake or within its 100-year floodplain north of the levee.

Fish are the top of the trophic ladder in most aquatic ecosystems and can be an indicator of biological integrity (Fausch et al. 1990). The fish community in McKellar Lake has been repeatedly evaluated by TVA during electrofishing sampling in 1974 (TVA 2007), entrainment monitoring in 1975 (as cited in TVA 2014), impingement monitoring in 1974 to

1976 (TVA 2007), cove rotenone sampling in 1979 and 1980 (as cited in TVA 2014), and additional impingement monitoring in 2004 to 2006 (TVA 2007). These studies found the fish community of McKellar Lake consisted primarily of warmwater species with a mix of both lake and riverine species due to the proximity and connectivity to the Mississippi River. The community also included a large number of both prey and predator species, indicating a relatively balanced ecosystem. However, as discussed in Section 3.4, reduced water quality due to sedimentation and historic contamination from multiple industrial users has led to the listing of McKellar Lake in the State's CWA Section 303(d) list for impaired waterbodies (TDEC 2018b). The entire lake is listed as impaired for fish consumption due to elevated levels of chlordane, other organics, and mercury (TDEC 2018a). Sources of impairment may include storm water runoff from numerous industrial facilities and urban development in the area, sanitary sewer overflows, dredging for navigation channels, contaminated sediments, and discharges from separate municipal storm sewer systems.

Prior sampling of larval fish and eggs at ALF in 1975 identified fishes belonging to seven families (as cited in TVA 2014). Collections were dominated by fishes more typical of a riverine environment including shad, suckers, minnows, and freshwater drum. Rotenone sampling in the 1979 to 1980 produced a total catch of 45 species including 15 commercially valuable and 21 recreationally valuable species (as cited in TVA 2014):

- Common centrarchid (sunfish) species present at ALF included black crappie, white crappie, bluegill, green sunfish, longear sunfish, orangespotted sunfish and warmouth.
- Benthic invertivore (primarily feed on invertebrates) species were dominated by freshwater drum, while gizzard shad was the dominant species by number and biomass.
- Top carnivore species present included white bass, yellow bass, striped bass, spotted bass, largemouth bass, black crappie, white crappie, sauger, spotted gar, bowfin, black bullhead catfish, walleye, yellow bullhead catfish, channel catfish and flathead catfish (TVA 1995).

Impingement of fishes collected on ALF traveling water screens was monitored during 2004 to 2006 and compared with historical data collected during 1974 to 1976 (TVA 2007). Gizzard shad were the most abundant species collected in both studies, followed by other herring species, and freshwater drum. Notably, silver carp presence began in 2005 to 2006.

Overall, the species composition found in all studies was typical of a warmwater community commonly found in this section of the Mississippi River watershed. Historic and recent analyses concluded that impingement at ALF did not adversely affect the aquatic communities of McKellar Lake or the adjacent Mississippi River. Additionally, the low collection rate of larval fish and eggs suggested that McKellar Lake is not an important spawning area for fish. Recent collections of nuisance species (e.g., Asian carp) are common throughout the Mississippi River and associated tributaries and unrelated to plant activities.

The three ALF coal units were retired in 2018. Virtually all coal unit operational measures were discontinued, and the coal plant is currently subject to basic care and maintenance measures. Primary operational measures that were discontinued include daily coal barge

operations, pumping and use of water from McKellar Lake for condenser cooling, and thermal discharges to the Mississippi River.

Four laydown areas and a light use area are proposed as part of the project and are shown in Figure 1-2. There are no known surface waters or aquatic biota located in or adjacent to these laydown areas.

3.5.2 Environmental Consequences

3.5.2.1 Alternative D1 – Full Demolition of Units 1, 2 and 3 and Related Structures Resulting in a Brownfield Site, Drop Removal of Stacks and Structures

Potential direct impacts to aquatic resources from removal of the mooring cells and barge unloader in McKellar Lake could occur in the vicinity of these facilities. Mobile aquatic biota, such as fish, would be displaced temporarily during demolition activities but would quickly re-establish following these activities. Less mobile aquatic organisms (e.g., aquatic macroinvertebrates) would be directly impacted by the removal of the mooring cells and barge unloader in McKellar Lake. However, the area of impact would be small, and many less mobile species would repopulate quickly. Any construction activities in McKellar Lake would adhere to NPDES permit limit requirements and would utilize mitigation to minimize impacts to aquatic life. Impacts to aquatic life in McKellar Lake are expected to be minor with the implementation of BMPs and compliance with requirements of the USACE and TDEC permitting process. In the event a CWA Section 404 permit or Section 401 water quality certification is required, any applicable compensatory mitigation for impacts to surface waters would be identified through the permitting process.

Potential indirect impacts to aquatic resources could result from storm water runoff during demolition activities. However, surface water runoff from demolition activities would be mitigated through the implementation of storm water erosion controls in accordance with a SWPPP, which will be prepared for this project. Monitoring of current industrial storm water outfalls would continue throughout the demolition process, with modifications as directed by the SWPPP. Therefore, only short-term, minor impacts to aquatic ecology of McKellar Lake would be expected due to surface water runoff during demolition.

There would be no ongoing potential for direct discharges of chemicals, hazardous waste, or solid waste to McKellar Lake, because all equipment, structures, and contaminated soil would be removed from the area. With the use of proper BMPs and compliance with all federal, state, and local regulations and guidelines, impacts to aquatic life would be temporary and minor as these measures are designed to be protective of aquatic life.

3.5.2.2 Alternative D2 – Full Demolition of Units 1, 2 and 3 and Related Structures Resulting in a Brownfield Site, Mechanical Removal of Stacks and Structures

Impacts to aquatic resources under Alternative D2 would be the same as those described under Alternative D1. With the use of proper BMPs and compliance with all federal, state, and local regulations and guidelines, impacts to aquatic life would be short term and minor.

3.5.2.3 Alternative D3 – Full Demolition of Units 1, 2 and 3 and Related Structures Resulting in a Brownfield Site, Hybrid Removal of Stacks and Structures

Impacts to aquatic resources under Alternative D3 would be the same as those described under Alternative D1. With the use of proper BMPs and compliance with all federal, state,

and local regulations and guidelines, impacts to aquatic life associated with direct or indirect impacts would be short term and minor.

3.5.2.4 Alternative E – No Action

Under the No Action Alternative, TVA would not perform any deconstruction or other disposition activities at ALF. As a result, no project-related impacts to aquatic ecology would occur under the No Action Alternative.

3.6 Vegetation

3.6.1 Affected Environment

ALF is located in Shelby County, Tennessee, which is located in the Lower Mississippi Riverine Forest Province (Bailey 1995). The province consists of flat to gently sloping broad floodplain and low terraces made up of alluvium and loess. Historically the vegetation of this province was dominated by bottomland deciduous forest with an abundance of green ash, elm, cottonwood, sugarberry, sweetgum, and water tupelo, as well as oak and bald cypress. Pecan was also present, associated with eastern sycamore and roughleaf dogwood (Bailey 1995).

As summarized in Table 3-1, land use/land cover within the region (i.e., in Shelby County within a 5-mile radius of ALF) is dominated by undeveloped lands with various vegetative cover types including: cultivated crops (9,297 acres or 24.0 percent), woody wetlands (6,457 acres or 16.7 percent), open water (6,365 acres or 16.4 percent), and deciduous forest (2,950 acres or 4.9 percent). Developed lands in the vicinity of ALF are associated with the industrial uses of the Frank C. Pidgeon Industrial Park and the International Port of Memphis and the non-industrial, residential uses in the neighborhoods of southeast Memphis.

The proposed decontamination and deconstruction project area and laydown areas 1 through 3 are located within the ALF property boundary and are characterized by industrial development (Table 3-1). Laydown area 4 is undeveloped and land cover is primarily mowed herbaceous cover. The light use area consists of a gravel parking lot located on the ACC property. Additionally, various impervious road surfaces cross and surround the project areas.

Based on a desktop review and previous site reconnaissance of the proposed decontamination and deconstruction project area and laydown areas, no unique plant communities are present within these areas. Vegetation within these disturbed areas has been managed to maintain its open condition and, as a result, it is dominated by mowed turf grasses and ruderal/early successional non-native and weedy herbaceous species.

Table 3-1. Land Use/Land Cover Within the Proposed Project Site and the Region (acres)

Land Use Type	Decontamination and Demolition Site	Laydown Area 1	Laydown Area 2	Laydown Area 3	Laydown Area 4	Light Use Area	5-Mi Radius
Evergreen Forest							44.9
Mixed Forest							117.6
Herbaceous	1.34	0.7			45.9		138.8
Barren Land							221.3
Emergent Herbaceous Wetlands							236.2
Hay/Pasture							449.7
Shrub/Scrub							503.7
Developed, High Intensity							1,404.6
Developed, Medium Intensity							2,230.0
Developed, Low Intensity	48.0	5.8	11.9	2.4	0.2	5.4	2,930.7
Developed, Open Space	0.08						4,129.0
Deciduous Forest					0.1		4,252.2
Open Water	0.2						6,365.6
Woody Wetlands							6,456.5
Cultivated Crops							9,297.4
Total	49.6	6.5	11.9	2.4	46.1	5.4	38,778.3

Source: Homer et al. 2015

3.6.2 Environmental Consequences

3.6.2.1 Alternative D1 – Full Demolition of Units 1, 2 and 3 and Related Structures Resulting in a Brownfield Site, Drop Removal of Stacks and Structures

Implementation of Alternative D1 would result in direct impacts to vegetation. Impacts to vegetation within the proposed decontamination and deconstruction project area, laydown areas, and light use area would be permanent, but the vegetation found in these areas is composed of common, non-native weeds and early successional species that have little conservation value. Overall, potential impacts are negligible relative to the abundance of similar cover types within the vicinity.

The laydown areas and light use area would be impacted mostly by storage of equipment and materials during construction. Direct impacts from storage and movement of materials would likely result in disturbance of soil and destruction of plants growing in traffic paths or directly under stored materials. Post-construction, these areas would revert to their original use; therefore, the impact to any vegetation present would be short term and minor.

Project-related construction would result in localized disturbances of surface areas that have the potential to increase establishment of invasive plants. However, these sites are all currently disturbed and are characterized by weedy, early successional species. Impacts would be minimized as the site would be revegetated using native or non-invasive species as outlined in The Tennessee Erosion and Sediment Control Handbook (TDEC 2012). Potential indirect impacts on vegetation adjacent to the haul roads to transport borrow material to ALF would include deposition of fugitive dust during transportation. BMPs such as covered loads and equipment maintenance would be implemented as appropriate to minimize impacts. Therefore, direct and indirect adverse impacts to vegetation would be minor.

Following completion of the deconstruction, disturbed areas would be reseeded with native or non-invasive vegetation or otherwise permanently stabilized. This would constitute a minor beneficial impact to vegetation.

3.6.2.2 Alternative D2 – Full Demolition of Units 1, 2 and 3 and Related Structures Resulting in a Brownfield Site, Mechanical Removal of Stacks and Structures

Impacts to vegetation under Alternative D2 would be the same as those described for Alternative D1 and would be minor.

3.6.2.3 Alternative D3 – Full Demolition of Units 1, 2 and 3 and Related Structures Resulting in a Brownfield Site, Hybrid Removal of Stacks and Structures

Impacts to vegetation under Alternative D3 would be the same as those described for Alternative D1 and would be minor.

3.6.2.4 Alternative E – No Action

Under the No Action Alternative, TVA would not perform any deconstruction or other disposition activities at ALF. As a result, no new work would be conducted that would result in the loss or disturbance of vegetation, and therefore no project-related environmental impacts to vegetation would occur under this alternative.

3.7 Wildlife

3.7.1 Affected Environment

The decontamination and deconstruction area, laydown areas, and light use area for the proposed action at ALF have been heavily disturbed and altered for many years due to the construction and operation of ALF. Only small areas of herbaceous vegetation currently exist in these project areas, most of which occurs in the laydown areas.

Important Bird Areas in Tennessee are designated by the Tennessee Wildlife Resources Agency (TWRA), partnered with the National Audubon Society's Audubon Important Bird Area program, and are identified as being important for the conservation of bird populations. The proposed decontamination and deconstruction project area and temporary laydown areas are included within the boundaries of the Ensley Bottoms Complex, part of the Mississippi Alluvial Valley in Tennessee Important Bird Area. The Ensley Bottoms Complex is described as containing sludge treatment ponds, fields for drying sludge, some agricultural experimental plots, industrial area, agricultural fields, lakes, grasslands, and bottomland forest, and includes the ALF surface impoundments, McKellar Lake, Presidents Island Wildlife Management Area north of McKellar Lake, T. O. Fuller State Park, the T.E. Maxson Waste Water Treatment Plant, and other public and private lands in the vicinity of ALF. One of the few breeding populations of painted buntings in Tennessee is found in the Ensley Bottoms Complex, in the scrubby forested lands west of ALF and just south of the plant (TN IBA 2018; eBird 2018). According to the Tennessee Important Bird Areas Program website, the Ensley Bottoms complex is also the most important shorebird site in Tennessee and one of the most important inland shorebird sites in the southeast. In addition, waterfowl (ducks, geese, and swans) are common and the Mississippi River is a major migration corridor for American White Pelicans, raptors, wading birds, gulls, and terns (TN IBA 2018).

Because the decontamination and deconstruction project area, laydown areas, and light use area are predominantly developed, the wildlife communities associated with any small habitat areas remaining in these project areas generally consist of more common species that can easily adapt to disturbed or altered habitats. Therefore, these areas are not expected to support any unique or rare wildlife species. Some wildlife species are known to use man-made structures opportunistically. Common mammals, birds, and reptiles have been observed using parts of buildings abandoned or used infrequently by humans. Several species of bats commonly found in this region may roost in dark or quiet areas of these abandoned buildings. Common species of bat in Tennessee known to use human structures include the big brown bat, evening bat, silver-haired bat, and southeastern bat (Bat Conservation International 2019).

The mowed and early successional habitat of Laydown Area 4 may provide some limited nesting and foraging habitat for common grassland and shrubland bird species and small mammals. Birds commonly observed in urban landscapes with early successional habitat interspersed with human infrastructure and dwellings include killdeer, indigo bunting, gray catbird, northern mockingbird, northern cardinal, eastern bluebird, American goldfinch, European starling, mourning dove, house sparrow, house finch, common grackle, song sparrow, field sparrow, and American robin. Red-tailed hawk and American kestrel also forage along road rights-of-way. Mammals routinely observed in this type of landscape include Virginia opossum, raccoon, eastern cottontail, white-tailed deer, eastern mole, woodchuck, and rodents such as white-footed mouse and hispid cotton rat. Common reptiles include black racer, black rat snake and eastern garter snake.

One heron rookery has been documented by the Tennessee Natural Heritage Program and the TVA Regional Natural Heritage database approximately 3.5 miles from the project footprint (TDEC 2019a; TDEC 2019b; TVA 2018). Based on review of aerial photography, no suitable habitat for heron colonies are available within the proposed decontamination and deconstruction area, laydown areas, or light use area. One osprey nest is known from the project action area. The structure on which the nest is built is proposed for demolition. Review of the TVA Regional Natural Heritage database resulted in no records of caves or any other unique terrestrial habitat within 3 miles of the project area. Should wading bird colonies or caves be identified during decontamination and deconstruction activities, they would be examined, and actions would be taken to minimize or avoid impacts.

Review of the USFWS's Information for Planning and Consultation (IPaC) database (<https://ecos.fws.gov/ipac/>) resulted in identification of twelve migratory birds of conservation concern that have the potential to be impacted by the proposed actions: least tern, American golden-plover, bald eagle, cerulean warbler, Kentucky warbler, Le Conte's sparrow, lesser yellowlegs, prothonotary warbler, red-headed woodpecker, rusty blackbird, semi-palmated sandpiper, and wood thrush. Two species of bird, the lark sparrow and Mississippi kite, that are known to occur within three miles of the proposed decontamination and deconstruction project area (TVA 2018; eBird 2018), were previously listed by the TWRA as "in need of management"; however, they were removed from this list in 2018 (TWRA 2018b). These species are still species of concern as protected migratory birds. None of these species of migratory birds are likely to inhabit or use these buildings and structures or the open and early successional habitat of the laydown areas. However, shorebirds do use the ash ponds immediately adjacent to the proposed project area. Information regarding threatened and endangered species surrounding the project site can be found in Section 3.8.

3.7.2 Environmental Consequences

3.7.2.1 Alternative D1 – Full Demolition of Units 1, 2 and 3 and Related Structures Resulting in a Brownfield Site, Drop Removal of Stacks and Structures

Any wildlife (primarily common, habituated species) found in the proposed decontamination and deconstruction project area would be permanently displaced. Direct effects to common wildlife in all project areas may occur to some individuals that may be immobile during the time of project activities (i.e. juveniles or eggs). This could be the case if project activities took place during breeding/nesting seasons. However, the actions are not likely to affect populations of species common to the area, as use of these buildings by wildlife is opportunistic, and similar industrial buildings and structures exist in the surrounding landscape. At present no species of concern, other than one osprey, are known to use any of the structures within the decontamination and deconstruction area. An extensive survey would be performed between one and three months prior to deconstruction to determine if active nests of migratory birds are present. If active nests of migratory birds are present and decontamination and deconstruction activities must occur within the active nesting season, TVA would coordinate with USDA Wildlife Services, which assists with managing any potential impacts to birds, to determine best options for carrying out demolition activities.

Based on the small amount of fragmented habitat and the significant amount of disturbance in the areas immediately adjacent to the decontamination and deconstruction project area, laydown areas and light use area, populations of migratory birds are not likely to inhabit these areas and therefore are not likely to be impacted. However, one individual osprey built a nest in the action area in the spring of 2019. The osprey nest would need to be

removed as it is on a structure proposed for demolition. The nest would be removed while the nest is inactive to avoid direct impacts to nesting osprey. Osprey returning to nest in the area following demolition would likely select an alternative natural nesting location once this structure is removed. Osprey populations in the Tennessee Valley are increasing. Displacement of one osprey nest would not impact populations of this species. In addition, some species of migratory shorebirds nest and forage at the surface impoundments adjacent to the proposed project areas. Shorebirds present would be flushed by loud decontamination, deconstruction, and restoration activities but are expected to return once the activities cease. No active heronries are known within 660 feet of the proposed actions, so none would be impacted by the proposed actions.

Under this alternative, the common and habituated wildlife found in the decontamination and deconstruction project area, laydown areas, and light use area would continue to use other available habitats within and adjacent to the ALF property. During construction, most wildlife present within the project sites would likely avoid the construction sites and disperse to adjacent and/or similar habitats. Direct impacts to less mobile fauna would be expected. However, given the highly fragmented and disturbed nature of the project areas, such faunal communities are considered to be common and of low quality. As such any adverse impacts during project activities would be minor.

Wildlife that inhabit early successional herbaceous habitats are expected to return following soil and seed installation at the proposed decontamination and deconstruction project area resulting in a minor beneficial impact for wildlife.

3.7.2.2 Alternative D2 – Full Demolition of Units 1, 2 and 3 and Related Structures Resulting in a Brownfield Site, Mechanical Removal of Stacks and Structures

Impacts to wildlife under Alternative D2 would be the same as those described for Alternative D1 and would be minor.

3.7.2.3 Alternative D3 – Full Demolition of Units 1, 2 and 3 and Related Structures Resulting in a Brownfield Site, Hybrid Removal of Stacks and Structures

Impacts to wildlife under Alternative D3 would be to the same as those described for Alternative D1 and minor.

3.7.2.4 Alternative E – No Action

Under the No Action Alternative, TVA would not perform any deconstruction or other disposition activities at ALF. As a result, no new work would be conducted that would result in the loss or disturbance of wildlife habitat. Therefore, no project-related impacts to wildlife would occur.

3.8 Threatened and Endangered Species

3.8.1 Affected Environment

The ESA (16 United States Code [USC] §§ 1531-1543) was passed to conserve the ecosystems upon which endangered and threatened species depend, and to conserve and recover those species. An endangered species is defined by the ESA as any species in danger of extinction throughout all or a significant portion of its range. A threatened species is likely to become endangered within the foreseeable future throughout all or a significant part of its range. Critical habitats, essential to the conservation of listed species, also can

be designated under the ESA. The ESA establishes programs to conserve and recover endangered and threatened species and makes their conservation a priority for Federal agencies. Section 7 of the ESA requires federal agencies to consult with the U.S. Fish and Wildlife Service (USFWS) when their proposed actions may affect endangered or threatened species or their critical habitats.

The State of Tennessee provides protection for species considered threatened, endangered, or deemed in need of management within the state other than those federally listed under the Endangered Species Act. The listings are handled by the TDEC; additionally, the Tennessee Natural Heritage Program and TVA both maintain databases of species that are considered threatened, endangered, special concern, or tracked in Tennessee.

A review of the TVA Regional Natural Heritage database in December 2018 resulted in records for three federally protected species (bald eagle, interior least tern, and piping plover) and two species designated as rare or listed by TDEC (striped whitelip snail and blue sucker) within a 3-mile (terrestrial wildlife species) or 10-mile (aquatic species) radius of ALF (as indicated by asterisks in Table 3-2). Review of the USFWS IPaC website identified two additional federally-listed species, the Indiana bat (*Myotis sodalis*) and the northern long-eared bat (*Myotis septentrionalis*), that have the potential to occur in the proposed decontamination and deconstruction project area, though no records in Shelby County are known to date. TDEC lists a total of 27 species listed as rare in Tennessee that are known to occur in Shelby County (Table 3-2) (TDEC 2019b).

No state- or federally-listed plant species or designated critical habitats have been documented within a 5-mile vicinity of ALF. Additionally, no federally-listed plant species are known to occur in Shelby County, Tennessee.

Table 3-2. Species of Conservation Concern Documented to Occur in Shelby County, Tennessee and Federally-Listed Species With Potential to Occur in Shelby County, Tennessee

Common Name	Scientific Name	Status		Suitable Habitat Present ⁴
		Federal ¹	State ² (Rank ³)	
Birds				
Bald eagle*	<i>Haliaeetus leucocephalus</i>	DM	D (S3)	N
Bell's vireo	<i>Vireo bellii</i>	--	Rare (S1B)	N
Bewick's wren	<i>Thryomanes bewickii</i>	--	D (S1)	N
Cerulean warbler	<i>Dendroica cerulea</i>	--	D (S3B)	N
Interior least tern*	<i>Sterna antillarum athalassos</i>	LE	E (S2S3B)	N
Piping plover*	<i>Charadrius melodus</i>	LT		N
Swainson's warbler	<i>Limnothlypis swainsonii</i>	--	D (S3)	N
Mammals				
Eastern woodrat	<i>Neotoma floridana illinoensis</i>	--	D (S3)	N
Indiana bat ⁵	<i>Myotis sodalis</i>	LE	E (S1)	P (limited)
Northern long-eared bat ⁵	<i>Myotis septentrionalis</i>	LT	T (S1S2)	P (limited)
Reptiles				
Northern pinesnake	<i>Pituophis melanoleucus</i>	--	T (S3)	N
Insects				
Bronze copper	<i>Lycaena hyllus</i>	--	Rare (S3)	N
Ampibians				
Southern cricket frog	<i>Acris gryllus</i>	--	Rare (S2S3)	N
Mollusks				
Fatmucket	<i>Lampsilis siliquoidea</i>	--	Rare (S2)	P (limited)
Southern hickorynut	<i>Obovaria jacksoniana</i>	--	Rare (S1)	N
Striped whitelip*	<i>Webbhelix multilineata</i>	--	Rare (S2)	N
Fish				
Blue sucker*	<i>Cycleptus elongatus</i>	--	T (S2)	N
Naked sand darter	<i>Ammocrypta beani</i>	--	D (S2)	N
Piebald madtom	<i>Noturus gladiator</i>	--	D (S3)	N
Plants				
American ginseng	<i>Panax quinquefolius</i>	--	S-CE (S3S4)	N
Cedar elm	<i>Ulmus crassifolia</i>	--	S (S2)	N
Copper iris	<i>Iris fulva</i>	--	T (S2)	N
Featherfoil	<i>Hottonia inflata</i>	--	S (S2)	N
Harvey's beakrush	<i>Rhynchospora harveyi</i>	--	T (S1)	N
Multiflowered mud-plantain	<i>Heteranthera multiflora</i>	--	S (S1)	N
Ovate catchfly	<i>Silene ovata</i>	--	E (S2)	N
Red starvine	<i>Schisandra glabra</i>	--	T (S2)	N
Sweetbay magnolia	<i>Magnolia virginiana</i>	--	T (S2)	N
Willow aster	<i>Symphotrichum praealtum</i>	--	E (S1)	N

Common Name	Scientific Name	Status		Suitable Habitat Present ⁴
		Federal ¹	State ² (Rank ³)	
Sources: TVA 2018, TDEC 2019, and USFWS IPaC 2019				
¹ Federal Status Codes:				
DM = Delisted, Recovered, and Being Monitored		LE = Listed Endangered		
LT = Listed Threatened;		-- = Not Listed by USFWS		
² State Status Codes:				
E = Listed Endangered		S = Species of special concern		
T = Listed Threatened		Rare = Rare, but not state listed		
D = Deemed in Need of Management		CE = Commercially Exploited		
³ State Rank:				
S1 = Critically Imperiled		S2 = Imperiled		
S3 = Vulnerable		S4 = Apparently Secure		
S#S# = Denotes a range of ranks because the exact rarity of the element is uncertain (e.g., S1S2)				
Migratory Species may have separate ranks for different population segments (e.g. S1B, S2N, S4M);				
S#B = rank of breeding population		S#N = rank of non-breeding population		
⁴ Habitat Codes:				
Y = Yes, species has been documented in existing habitats within proposed decontamination and deconstruction project area boundary, laydown areas, and/or the light use area, and suitable habitat is present				
N = No, no records of species within proposed project areas and no suitable habitat is present				
P = Potentially suitable habitat is present, but no records of species in proposed project areas				
⁵ Federally listed species whose range includes Shelby County, Tennessee, though no records are known from this county.				
*Species documented within 3 miles (terrestrial species), 5 miles (plants) or 10 miles (aquatic species) of ALF by the TVA Natural Heritage Database.				

3.8.1.1 Wildlife

3.8.1.1.1 Terrestrial Animals

Birds

Bald eagles are typically found near large, open bodies of water such as rivers, lakes, and reservoirs. Bald eagles will nest on cliffs or large trees near water (NatureServe 2018). Suitable nesting and foraging habitats exist along the Mississippi River adjacent to ALF. One bald eagle nest was recorded in 2008, west of ALF on the east bank of the Mississippi River (TVA 2018). TWRA observed adult eagles at this nest on March 1, 2019 indicating it is still active. This nest is approximately 0.4 miles from a laydown area and 1.1 miles from any buildings proposed for demolition. Two additional nests near ALF were active from approximately 1999 to 2005 and 2001 to 2005, but they have not been active since and nests were no longer intact at last field survey. There are no trees in the proposed decontamination and deconstruction area, laydown areas, or light use area that would support a bald eagle nest or roosting. However, eagles may be seen flying over and near the project areas as they move between foraging areas along the Mississippi River and McKellar Lake.

Bell's vireo requires scrub-shrub, dense brush, willow thickets, or narrow early successional wooded areas with dense understories such as those often found along small stream corridors (NatureServe 2018). Bell's vireos tend to prefer the above-mentioned habitats if they are scattered within more open grassland or agricultural landscapes versus forest dominated areas. Small blocks of grassland/shrub habitats surrounded by mature forests may be avoided by this species. Due to the lack of dense vegetation, suitable habitat for this species is not present within the proposed decontamination and deconstruction area,

laydown areas, or light use area. In addition, no records of Bell's vireo are known to exist within 3 miles of ALF.

Bewick's wren occurs in farmyards, brushy areas, open woods, and overgrown fields. They typically nest in small cavities, both those naturally occurring in trees and small human made cavities. When not nesting this species can be found in open habitat including weedy fields, farm buildings, fencerows, and pastures (NatureServe 2018). Due to the presence of only maintained open habitat and the lack of tree cavities and brushy areas, the proposed decontamination and deconstruction area, laydown areas, and light use area do not contain Bewick's wren habitat.

Cerulean warblers typically nest in forested areas with numerous large trees, although they have been known to use other types of nesting habitat opportunistically. These migratory birds are only found in Tennessee while nesting or as passing migrants. Their non-breeding habitat is in South America (NatureServe 2018). No known occurrences of cerulean warblers have been recorded in the TVA heritage database within 3 miles of ALF, and due to the presence of only maintained open habitat and the lack of trees, the proposed decontamination and deconstruction area, laydown areas, and light use area do not contain cerulean warbler habitat.

The interior least tern nests and forages on open shorelines, riverine sandbars and mudflats throughout the Mississippi and Missouri river drainages (USFWS 2013). Suitable nesting habitat is sparsely vegetated with sand or gravel substrate and located near an adequate food supply. Fidelity exhibited by terns across years to a particular site is strongly influenced by the dynamic nature of river hydrology, which may change island size and vegetative cover annually. Least terns also have been documented using inland sites created by humans such as dredge spoil and stilling impoundments associated with coal plants, where site characteristics mimic (to some degree) natural habitat (TVA 2016).

The interior least tern is a locally common summer resident in Tennessee along the Mississippi River and a rare migrant elsewhere in Tennessee. Individuals begin arriving in early May and are concentrated in the western half the state. Nesting colonies of least tern have been documented on ALF property and adjacent lands. Summer colonies have been documented adjacent to the decontamination and deconstruction project area at ALF along the banks of the East and West Ash Pond Complexes in 2010, 2011, 2013, and 2019. In 2019 terns were also observed nesting in a gravel lot next to the ACC (including the area proposed for light use). Occurrence of nesting colonies at ALF ash ponds typically coincides with prolonged flooding along the nearby Mississippi River, where more suitable nesting sites (sandy islands, sand bars, and river banks) are rendered inaccessible due to persistent high water levels. Since the first observation of nesting at the West Ash Pond, vegetation has grown up rendering the West Ash Pond no longer suitable for nesting least terns.

The proposed decontamination and deconstruction area and laydown areas do not contain sand bar, mudflat, or ash pond habitat for the interior least tern. However, interior terns were observed nesting in light colored gravel of the area proposed for light use in 2019.

Nesting success by least terns at ALF has been extremely low in past years. Road closures, fencing, and other protective measures put in place to avoid nests have done little to prevent nest failure. In 2010, of 55 observed nests which produced 70 eggs at ALF, only two chicks successfully fledged. Despite all efforts to protect the nests from human

disturbance, predation from species such as coyotes, Canada geese, and great blue herons, as well as heavy rain events that inundated nests, caused 98 percent of the nests to fail. Similarly, of the 48 nests observed in 2019, three chicks hatched, none of which survived to fledgling age.

The piping plover is a small shorebird, and occurrence of this species is limited to fall and summer migration seasons within the Tennessee Valley Region, where the species is considered a rare fall migrant and extremely rare spring migrant. Adult female piping plovers typically migrate from summer to winter grounds during July; adult males and juveniles migrate between late August and early September. The frequency of observance of this species within this region has been less than annual, with time spent averaging two days per stay at interior stopover sites. Piping plovers are routinely observed on islands in the Mississippi River near Memphis (TVA 2016).

Studies of migration ecology suggest that piping plover does not concentrate in large numbers during migration and that most sightings were of individual birds. Although the species uses a variety of habitats, most interior sites used by piping plovers included reservoir shorelines. Piping plovers were noted to move quickly through the southern states during spring, often overflying southern states. The species appears to select stopover sites opportunistically (USFWS 2003). One piping plover was observed foraging along the East Ash Impoundment Complex adjacent to the decontamination and deconstruction project area in 2010. Given the infrequency of occurrence by this species in the region and no sand bar, or mudflat shoreline habitat within the proposed decontamination and deconstruction project area, laydown areas, or light use area, it is unlikely that the piping plover would occur in the proposed project areas during the time of deconstruction.

Swainson's warbler nests in areas with dense, shrub vegetation. It is a very secretive bird and is infrequently observed. It is most commonly seen nesting in cane breaks, low floodplain forests, and rhododendron and mountain laurel thickets. Tennessee is within the breeding range of the Swainson's warbler (NatureServe 2018). Due to the lack of dense vegetation within the proposed decontamination and deconstruction project area, laydown areas, or light use area, it is unlikely that the Swainson's warbler would be found in these areas, and the TVA heritage database has no records of this species within 3 miles of ALF.

Mammals

Bats

The Indiana bat is found throughout much of the eastern half of the United States and has been listed as a federally endangered species since March 11, 1967. It is also listed in Tennessee as endangered. Per the 2018 Range-Wide Indiana Bat Summer Survey Guidelines, "suitable summer habitat for Indiana bats consists of a wide variety of forested/wooded habitats where they roost, forage, and travel and may also include some adjacent and interspersed non-forested habitats such as emergent wetlands and adjacent edges of agricultural fields, old fields and pastures. This includes forests and woodlots containing potential roosts (i.e., live trees and/or snags greater than 5 inches in diameter at breast height that have exfoliating bark, cracks, crevices, and/or hollows" (USFWS 2018). Other summer habitat may include riparian zones, bottomlands, floodplains, wooded wetlands, and adjacent upland forests (USFWS 2007). Individual trees may be considered suitable habitat when they exhibit characteristics of suitable roost trees and are within 1,000 feet of other forested habitat (USFWS 2018). Tree species that Indiana bats have been known to roost and establish maternity colonies in include hickory (*Carya* spp.), oak

(*Quercus* spp.), elm (*Ulmus* spp.), ash (*Fraxinus* spp.), maple (*Acer* spp.), and poplar (*Populus* spp.) trees. Some tree species, primarily hickories and, to a lesser extent, oaks, provide adequate bark characteristics in living trees. Space between exfoliating bark and the trunk of the tree appear to be the primary characteristic needed for bats to use a particular tree (USFWS 2007). Occasionally, Indiana bats have used buildings for summer roosting or for maternity colonies (Bat Conservation International 2019). In winter, Indiana bats hibernate in caves or abandoned mines (USFWS 2007). There are no records of caves occurring within 5 miles of ALF (TVA 2018).

The closest summer record of Indiana bat to the project site occurs in Benton County, Mississippi, within Holly Springs National Forest, which is located approximately 50 miles to the southeast of the proposed decontamination and deconstruction project area. This record is of a roost tree identified by tracking a female Indiana bat during spring migration from a cave in White County, Tennessee, in 2013. The closest winter record of Indiana bat to the project site is of a hibernaculum (winter habitat) greater than 100 miles to the east in Tishomingo County, Mississippi. No Indiana bats have been observed at this location, since 1939. However, this hibernaculum is no longer thought to be active, due to the collapse of the mine in which it occurred (TVA 2016).

The northern long-eared bat occurs statewide in Tennessee but is now uncommon in the state after the introduction of the fungus causing the deadly disease known as white-nose syndrome has caused dramatic declines in populations of this species. They were federally-listed as a threatened species in April of 2015 and are also listed as threatened by the state of Tennessee. In summer months, northern long-eared bats roost singly or in colonies within cavities, underneath bark, crevices, or hollows of both live and dead trees that typically have a diameter at breast height greater than or equal to 3 inches. Northern long-eared bats appear to be opportunistic, selecting trees based on the presence of cavities, crevices, or peeling bark. If suitable roost trees are not available, northern long-eared bats have been known, although rarely, to roost in manmade structures such as barns, bridges, and sheds. Northern long-eared bats emerge from their roosts at dusk to forage through the understory of forested hillsides and ridges feeding on insects (USFWS 2015).

Suitable summer habitat for the northern long-eared bat includes a wide variety of forested lands to roost, forage, and travel. This includes forests containing potential roosts such as woodlots, fencerows, riparian forests, and other wooded corridors. These wooded areas may be dense or loose aggregates of trees with variable amounts of canopy closure. Individual trees may be considered suitable habitat when they exhibit characteristics of suitable roost trees and are within 1,000 feet of other forested habitat. Non-forested foraging habitats may include adjacent emergent wetlands and edges of agricultural fields, old fields, and pastures. Northern long-eared bats typically occupy their summer habitat from mid-May through mid-August (USFWS 2018). In winter, the northern long-eared bat hibernates underground in caves or other manmade structures such as mines (USFWS 2015).

There are no trees greater than 3 inches diameter at breast height in the decontamination and deconstruction project area, laydown areas, or light use area that would represent suitable summer roosting habitat for the Indiana bat or northern long-eared bat; however, there is potential for summer roosting habitat or opportunistic short-term roosting sites during migration in the buildings within the proposed decontamination and deconstruction project area. No suitable winter roosting or hibernacula sites are present within the project areas. Low quality foraging habitats may be present within the proposed project areas

(surface impoundments) for the Indiana bat and northern long-eared bat. However, larger, higher quality foraging habitats are available in surrounding areas that would provide adequate foraging areas for bats that may utilize these areas.

Other Mammals

The eastern woodrat is generally found in forested areas, caves, and rocky outcrops (TWRA 2019a). The geographic range of this species includes Illinois, Missouri, Arkansas, Tennessee, Kentucky, Alabama, Mississippi, Florida, and Louisiana (IDNR 2010). No suitable habitat for this species is present within the proposed decontamination and deconstruction project area, laydown areas, or light use area.

Reptiles

Northern pinesnakes are egg laying snakes that breed in spring, with hatchlings emerging in late summer. The northern pinesnake's preferred habitat is characterized by xeric, pine or pine-oak dominated woodlands with open understory and sandy soils for burrowing (NatureServe 2018). As no pine or pine oak dominated woodlands are within the project boundaries, no suitable habitat for this species is present within the proposed decontamination and deconstruction project area, laydown areas, or light use area. No records of this species are known within 3 miles of the project area (TVA 2018).

Insects

The bronze copper is a butterfly that is found in herbaceous wetlands, including marshes, sedge meadows, moist to wet grassy meadows, ditches, fens, and pondshore wetlands (NatureServe 2018). There are no known records of this species within a 3-mile vicinity of ALF. The decontamination and deconstruction project area and vegetated laydown areas for the proposed project do not contain wetlands; therefore, there is no suitable habitat for this species within the proposed decontamination and deconstruction project area, laydown areas, or light use area.

Amphibians

Southern cricket frogs inhabit grassy margins of swamps, ponds, ditches, and temporary pools. Reproduction occurs in shallow water (NatureServe 2018). According to the TVA Natural Heritage Database, an occurrence of this species was observed approximately 8.5 miles southeast of ALF in 1940. However, there are no ponds or wetlands in the proposed decontamination and deconstruction project area, laydown areas, or light use area. This species may opportunistically use the surface impoundments; however, this low quality habitat is not known to sustain populations of this species.

Mollusks

Striped whitelip is a terrestrial snail that is associated with lowland forest, sedge meadows, and fens (NatureServe 2018). Records within Tennessee occur within coastal plain habitat near the Mississippi River and within a 10-mile radius of ALF. Suitable habitat is not expected to occur within the proposed decontamination and deconstruction project area, laydown areas, or light use area.

3.8.1.1.2 Aquatic Animals

Mollusks

Fatmucket is a mussel usually found in quiet or slow-moving water with a mud bottom (NatureServe 2018). Lake McKellar could provide marginal habitat for fatmucket; however, the lake has impaired water quality and there are no known records for this species within a 10-mile radius of ALF.

Southern hickorynut is a mussel that is found on gravel in small to large rivers with low to moderate currents (NatureServe 2018). There is no habitat for this species within the proposed decontamination and deconstruction project area, laydown areas, or light use area, and no records of this species exist within a 10-mile radius of ALF.

Fish

Blue sucker is a bottom feeding fish that can be found in large rivers and lower parts of major tributaries in channels and flowing pools with moderate current. Occasionally they can be found in impoundments. Adults migrate upstream to spawn in riffles (NatureServe 2018). One blue sucker was captured in 1976 and one was captured 1979 during gill netting sampling in the Mississippi River near the Memphis Bridge. This species likely occurs within the Mississippi River in the vicinity of the condenser cooling water discharge. Because of the infrequency of this species in the region, the lack of current records in McKellar Lake, and the impaired water quality of the reservoir, it is unlikely that the blue sucker would occur in the proposed decontamination and deconstruction project area within McKellar Lake immediately adjacent to ALF.

Naked sand darter is a small fish that can be found on sandy bottoms of clean, medium to large streams, creeks, and small to medium rivers (NatureServe 2018). There is no habitat for the naked sand darter within the proposed decontamination and deconstruction project area, laydown areas, or light use area.

Piebald madtom is a small fish that inhabits small to medium mainstream rivers and lower parts of major tributaries with moderate depth and velocities. This species is usually found in areas with a clean, sandy or clay bottom and in areas associated with debris cover (NatureServe 2018). There is no habitat for the piebald madtom within the proposed decontamination and deconstruction project area, laydown areas, or light use area.

3.8.1.2 Plants

A review of the TVA Regional Natural Heritage database indicated that no state- or federally-listed plant species, or associated designated critical habitat, are known to occur on or within 5 miles of ALF (TVA 2018). Ten species of plants listed by the TDEC as threatened, endangered, or species in need of management in Tennessee are known to occur within Shelby County (see Table 3-2). No federally-listed plant species are known to exist in Shelby County. Preferred habitat for each species and the possibility of habitat within the proposed decontamination and deconstruction project area, laydown areas, or light use area are addressed in Table 3-3. Lands associated with the ALF decontamination and deconstruction area, laydown areas, and light use area have been extensively disturbed by current and/or previous land use. These areas are currently used for industrial purposes and do not contain intact, high-quality native plant communities (TVA 2014; AmecFW 2017).

Table 3-3. Habitat Requirements for Plant Species of Conservation Concern within Shelby County

Common Name	Habitat Requirements	Habitat within Project Areas*
American ginseng	Slopes of shaded, rich woodlands. ¹	N
Cedar elm	Bottomlands, along streams and rivers ¹	N
Copper iris	Swamps, bottomlands, along edges of sloughs, ditches, and ponds ²	N
Featherfoil	Roadside ditches, unprotected sloughs and swamps ¹	N
Harvey's beakrush	Damp to wet acidic sedge meadows, barrens, oak savannas, and flatwoods ³	N
Multiflowered mud-plantain	Shallow water and mud flats ²	N
Ovate catchfly	Open or forested with sandy or pebbly substrates, including floodplains ¹	N
Red starvine	Rich woods in bottomlands or bluffs along creeks and rivers ¹	N
Sweetbay magnolia	Acidic, forested wetlands ²	N
Willow aster	Moist prairies and marshes ²	N

Source:

¹ NatureServe 2018² TDEC 2019³ Chester 2015

*Habitat Codes:

Y = Yes, species has been documented in existing habitats in proposed project areas, and suitable habitat is present

N = No, no records of species within proposed project areas, and no suitable habitat is present

3.8.2 Environmental Consequences

3.8.2.1 Alternative D1 – Full Demolition of Units 1, 2 and 3 and Related Structures Resulting in a Brownfield Site, Drop Removal of Stacks and Structures

Foraging habitat for Indiana bat and northern long-eared bat occurs over McKellar Lake. Additionally, low quality foraging habitats for bat species may be present over the surface impoundments. No potential summer roosting trees for the Indiana and northern long-eared bats exist in the project areas.

Buildings proposed for demolition have the potential to provide suitable summer roosting habitat or migration stop-over roosting sites for the Indiana bat and northern long-eared bat. TVA would conduct presence/absence surveys prior to demolition of the structures to determine if listed bat species are utilizing these buildings. A number of activities associated with the proposed project, including building demolition, were addressed in TVA's programmatic consultation with the USFWS on routine actions and federally listed bats in accordance with ESA Section 7(a)(2) and completed in April 2018. For those activities with potential to affect bats, TVA committed to implementing specific conservation measures. These activities and associated conservation measures are identified on pages

5-7 of the TVA Bat Strategy Project Screening Form (Appendix B) and would be implemented as part of the proposed project.

The interior least tern was documented at the West Ash Pond in 2010; however, because the site has been substantially vegetated since that time the area is no longer considered suitable for nesting. The interior least tern has the potential to nest at the East Ash Pond Complex adjacent to the decontamination and deconstruction project area and in the light use area should water levels in the Mississippi River force them to abandon more suitable sand bars there as occurred in the summer of 2019. Although the surface impoundments would not be directly affected under this alternative there is a potential for indirect effects to nesting individuals at the adjacent impoundments due to the loud, potentially ground disturbing activities involved in demolition. There is also a potential for the terns to nest in the light use area. TVA has determined that the proposed actions may affect, but are not likely to adversely affect interior least terns. Consultation with USFWS under Section 7 of the Endangered Species Act was initiated on August 16, 2019 regarding potential impacts to least terns. In this consultation TVA proposed several avoidance measures to reduce the potential for impacts to least terns attempting to nest at ALF in future years.

1. Surveys of the ALF D4 project areas would occur in late April of any given year (for the duration of the project) to identify any exposed ash, gravel, or sand-like substrate that could provide nesting habitat for least terns.
2. Weekly observations of these potential nesting sites would occur beginning in mid-May and ending in mid-August of any given year (for the duration of the project) to identify any terns that return to the area.
3. If terns return to the ACC and are seen landing in the ACC gravel lot, the area would be vacated immediately. All personnel, equipment, and vehicles would be removed within a few days and the area would no longer be used again until all terns have left the area or until the end of September when birds are finished nesting, whichever comes first.
4. If terns return to ALF and are seen nesting in the East Ash Pond, no demolition or loud activities would be permitted within 300 feet of the nests.
5. If any of measures 1-4 cannot be met, TVA would reinitiate consultation with USFWS.

On September 12, 2019, TVA received concurrence from USFWS for proposed actions with adherence to the outlined avoidance measures; the consultation letters are included in Appendix C.

Although piping plovers routinely utilize islands in the Mississippi River near Memphis for migratory stopover sites, only one piping plover has been observed within ALF ash impoundments within the last five years. Given the infrequency of occurrence for the piping plover in this area, short duration of stopover, and lack of suitable mud flat or sand bar shoreline habitat within the decontamination and deconstruction project area, laydown areas, or light use area, no impacts to this species are anticipated.

There is no suitable nesting habitat for the bald eagle within the decontamination and deconstruction area, laydown areas, or light use area. There is an active nest approximately 0.4 miles from a laydown area and 1.1 miles from the closest building proposed for demolition. This nest is 1.25 miles from the closest stack proposed for demolition. Per the National Bald Eagle Management Guidelines, all proposed blasting and extremely loud noises would be greater than 0.5 miles from the nest. All other actions

would be greater than 660 feet from the nest. These actions are in compliance with the National Bald Eagle Management Guidelines (USFWS 2007).

McKellar Lake has the potential to provide low-quality habitat for the blue sucker and the fatmucket mussel. However, the Lake has impaired water quality and there are no records of the fatmucket occurring within 10 miles of ALF and no records of the blue sucker occurring in McKellar Lake. While blue sucker is likely to occur in the Mississippi River in the vicinity of the condenser cooling water discharge, no impacts to this species would occur as no project activities would be conducted in the river. Therefore, no impacts to the blue sucker or the fatmucket are anticipated under this alternative.

The proposed decontamination and deconstruction area, laydown areas, and light use area at ALF do not provide suitable habitat for the remaining listed species in Table 3-2; therefore, the project would have no impacts on the remaining rare, threatened and endangered species.

3.8.2.2 Alternative D2 – Full Demolition of Units 1, 2 and 3 and Related Structures Resulting in a Brownfield Site, Mechanical Removal of Stacks and Structures

Impacts to threatened and endangered species or their habitats under Alternative D2 would be the same as described for Alternative D1.

3.8.2.3 Alternative D3 – Full Demolition of Units 1, 2 and 3 and Related Structures Resulting in a Brownfield Site, Hybrid Removal of Stacks and Structures

Impacts to threatened and endangered species or their habitats under Alternative D3 would be the same as described for Alternative D1.

3.8.2.4 Alternative E – No Action

Under the No Action Alternative, TVA would not perform any deconstruction or other disposition activities at ALF. Facilities and structures would continue to be maintained in their current state. Under this alternative, there would be no impacts to threatened and endangered species or their habitats.

3.9 Floodplains

3.9.1 Affected Environment

A floodplain is the relatively level land area along a stream or river that is subject to periodic flooding. The area subject to a one percent chance of flooding in any given year is normally called the 100-year floodplain. The area subject to a 0.2 percent chance of flooding in any given year is normally called the 500-year floodplain. It is necessary to evaluate development in the 100-year floodplain to ensure that the project is consistent with the requirements of EO 11988, Floodplain Management. Floodplains within the decontamination and deconstruction project area are shown in Figure 3-1.

The proposed decontamination and deconstruction project area is located between McKellar Lake miles 1.6 and 2.1, left descending bank, in Shelby County, Tennessee, and shown in Figure 3-1. According to Profile 75P of the 2013 Shelby County Flood Insurance Study, at this location the 100-year flood elevation on McKellar Lake would be 225.0 feet above mean sea level (msl) and the 500-year flood elevation would be 230.5 feet msl (TVA 2014).

The four laydown areas and light use area proposed for use for this project are shown in Figure 3-1. Laydown area 4 would be located adjacent to the Mississippi River and behind the Ensley Levee, between Mississippi River Miles (MRM) 724.2 and 725.1. Laydown areas 1, 2, and 3 would be located between McKellar Lake miles 1.4 and 2.1. Based on Profile 75P of the 2013 Shelby County Flood Insurance Study, 100-year flood elevations on the Mississippi River would vary from 222.6 feet at MRM 724.2 to 224.9 feet at MRM 725.1. As stated, the 100- and 500-year flood elevations on McKellar Lake would be 225.0 and 230.5 feet. Elevations are referenced to NAVD 1988.

The Ensley Levee extends from about MRM 721.4 to MRM 725.1, left descending bank. As shown in Figure 3-1, the area behind the Ensley Levee is protected from the Mississippi River 100-year flood. The top of the Ensley Levee ranges from 237 to 238 feet (TVA 2014). The USACE has determined the 100-year flood level within the levee to be at elevation 204.0 with a coincidence high flood stage on the river, whereas the 500-year flood level within the levee has not been determined. Based on a review of the topographic map of this area, the Horn Lake Cutoff and one unnamed tributary are the only streams within the levee boundary. The existing ground elevation of the light use area is at about elevation 215 feet msl. The existing ground elevation of laydown area 4 is at about elevation 210 feet msl.

Laydown areas 1, 2, and 3 are located outside of the 100-year floodplain. Laydown area 4 and the light use area are located at or above elevation 210 feet msl which is above the “within levee” 100-year flood elevation of 204 feet. Therefore, each of these locations is consistent with EO 11988.

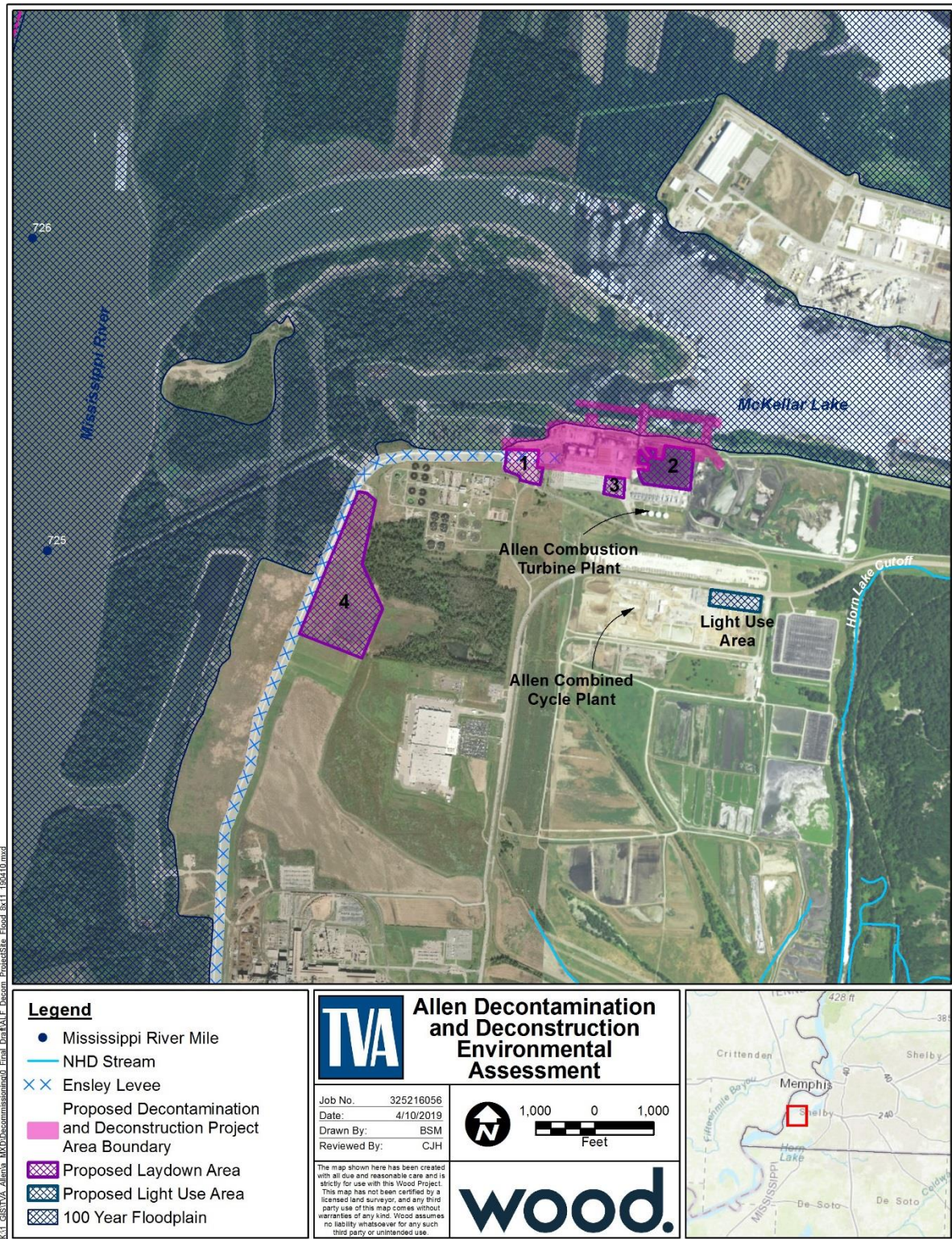


Figure 3-1. Floodplain and Streams within the Vicinity of ALF

3.9.2 Environmental Consequences

As a federal agency, TVA adheres to the requirements of EO 11988, Floodplain Management. The objective of EO 11988 is “to avoid to the extent possible the long- and short term adverse impacts associated with the occupancy and modification of floodplains and to avoid direct and indirect support of floodplain development wherever there is a practicable alternative” (EO 11988, Floodplain Management). The EO is not intended to prohibit floodplain development in all cases, but rather to create a consistent government policy against such development under most circumstances (U.S. Water Resources Council 1978). The EO requires that agencies avoid the 100-year floodplain unless there is no practicable alternative.

3.9.2.1 Alternative D1 – Full Demolition of Units 1, 2 and 3 and Related Structures Resulting in a Brownfield Site, Drop Removal of Stacks and Structures

Alternative D1 would include the decontamination and deconstruction of many existing structures at ALF. Of the structures and facilities proposed for deconstruction under Alternative D1, only the intake and discharge tunnels, barge unloader, mooring cells and conveyors, and fuel unloading cell and associated structures are located within the 100-year floodplain. Installing bulkheads within the intake and discharge tunnels would result in no changes to conditions found within the floodplain. Removing the other structures and facilities would have a slight beneficial impact on floodplains by increasing flood storage capacity on McKellar Lake. Scrap metal would be removed from the site, and concrete and masonry would be used onsite as backfill. To minimize adverse impacts from using concrete and masonry as backfill in the floodplain, the backfill would be placed at or below grade (at or below the ground surface), to not result in fill modifying the grade of the floodplain. There would be no changes to conditions found within the floodplain by abandoning utilities in place.

The stacks are located outside the 100-year floodplain of McKellar Lake. Removal of the stacks or other structures by drop removal may result in demolition debris that could potentially land within the floodplain. This would be a temporary impact because demolition debris would be removed from the ALF site. To minimize adverse impacts from using construction debris refuse as backfill in the floodplain, the backfill would be placed at-grade or below, to not result in fill within the floodplain.

To minimize adverse impacts on natural and beneficial floodplain values, the following mitigation measures would be implemented:

- Standard BMPs would be used during demolition and deconstruction activities
- Demolition and deconstruction material would be disposed of outside of 100-year floodplains
- Scrap concrete and masonry used as backfill in the floodplain would be placed at-grade or below

Based upon implementation of the above standard mitigation measures, the proposed deconstruction and demolition of ALF would have no significant impact on floodplains and their natural and beneficial values.

3.9.2.2 Alternative D2 – Full Demolition of Units 1, 2 and 3 and Related Structures Resulting in a Brownfield Site, Mechanical Removal of Stacks and Structures

Under Alternative D2, potential impacts to floodplains from all decontamination and deconstruction activities would be the same as those described under D1.

3.9.2.3 Alternative D3 – Full Demolition of Units 1, 2 and 3 and Related Structures Resulting in a Brownfield Site, Hybrid Removal of Stacks and Structures

Under Alternative D3, potential impacts to floodplains from all decontamination and deconstruction activities would be the same as those described under D1.

3.9.2.4 Alternative E – No Action

Under the Alternative E all existing buildings, structures, and equipment within the proposed decontamination and deconstruction project area would remain in place and would result in no changes to the existing conditions found within the local floodplains. Therefore, there would be no physical changes to the current conditions found within the local floodplains.

3.10 Wetlands

3.10.1 Affected Environment

The USACE regulates the discharge of dredged or fill material into waters of the United States, including wetlands, under the CWA Section 404 Permit [33 US Code § 1344]. Additionally, Executive Order 11990—Protection of Wetlands requires federal agencies to avoid possible long and short term impacts to wetlands and minimize their impact in order to preserve and enhance their natural and beneficial values.

As defined in Section 404 of the CWA, wetlands are those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support a prevalence of vegetation typically adapted for life in saturated soil conditions. Types of wetlands generally include swamps, marshes, bogs, and similar areas. Wetlands and wetland fringe areas can also be found along the edges of many watercourses and impounded waters (both natural and man-made). Wetland habitat provides valuable public benefits including flood storage, erosion control, water quality improvement, wildlife habitat, and recreation opportunities [33 CFR 328.39(b)].

The proposed decontamination and deconstruction project area is located near McKellar Lake and the Mississippi River in the Northern Mississippi Alluvial Plain Level IV Ecoregion (73a), a subdivision of the Mississippi Alluvial Plain Level III Ecoregion (73) where the land use and land cover are dominated by agriculture (Griffith et al. 2001). Bottomland deciduous forests were prominent in the region before they were cleared for agricultural use. Within the project area these forests are not present due to the ALF and ACC Plants and associated development in the area.

Based on a review of the National Wetlands Inventory mapping and recent aerial photography in January 2019, the proposed decontamination and deconstruction project area and laydown areas 1, 2, and 3 do not contain any wetlands as they have been heavily disturbed and developed for operation of ALF. A wetland delineation was conducted for the 2014 ALF Emission Control Project EA that includes areas common to the proposed laydown area 4 and the light use area. Potential jurisdictional wetlands were evaluated within these areas in accordance with the Regional Supplement to the Corps of Engineers

Wetland Delineation Manual: Atlantic and Gulf Coastal Plain Region (Version 2.0). Both of these areas have been heavily disturbed by current and/or previous land use and no wetlands were present. Although NWI mapping includes 8.1 acres of forested wetland within laydown area 4, based on the 2014 field delineation, wetlands are not present there, nor in the area designated for light use (TVA 2014).

3.10.2 Environmental Consequences

3.10.2.1 Alternative D1 – Full Demolition of Units 1, 2 and 3 and Related Structures Resulting in a Brownfield Site, Drop Removal of Stacks and Structures

Alternative D1 would not adversely affect wetlands as no wetlands are present within the decontamination and deconstruction project area or the laydown and light use areas.

3.10.2.2 Alternative D2 – Full Demolition of Units 1, 2 and 3 and Related Structures Resulting in a Brownfield Site, Mechanical Removal of Stacks and Structures

Under Alternative D2, impacts to wetlands would be the same as those described for Alternative D1 and there would be no impact to wetlands.

3.10.2.3 Alternative D3 – Full Demolition of Units 1, 2 and 3 and Related Structures Resulting in a Brownfield Site, Hybrid Removal of Stacks and Structures

Under Alternative D3, impacts to wetlands would be the same as those described for Alternative D1 and there would be no impact to wetlands.

3.10.2.4 Alternative E – No Action

Alternative E would not result in impacts to wetlands as the decontamination and deconstruction project area and associated laydown and light use areas would remain in their current condition.

3.11 Visual Resources

3.11.1 Affected Environment

This assessment provides a review and classification of the visual attributes of existing scenery, along with the anticipated attributes resulting from the proposed action. The classification criteria used in this analysis are adapted from a scenic management system developed by the U.S. Forest Service (USFS) and integrated with planning methods used by TVA (USFS 1995). Potential visual impacts to cultural and historic resources are not included in this analysis as they are assessed separately in Section 3.12.

The visual landscape of an area is formed by physical, biological, and man-made features that combine to influence both landscape identifiability and uniqueness. Scenic resources within a landscape are evaluated based on a number of factors that include scenic attractiveness, integrity and visibility. Scenic attractiveness is a measure of scenic quality based on human perceptions of intrinsic beauty as expressed in the forms, colors, textures, and visual composition of each landscape. Scenic integrity is a measure of scenic importance based on the degree of visual unity and wholeness of the natural landscape character. The varied combinations of natural features and human alterations both shape landscape character and help define their scenic importance. The subjective perceptions of a landscape's aesthetic quality and sense of place is dependent on where and how it is viewed.

Scenic visibility of a landscape may be described in terms of three distance contexts: foreground, middleground, and background. In the foreground, an area within 0.5 mi of the observer, individual details of specific objects are important and easily distinguished. In the middleground, from 0.5 to 4 mi from the observer, object characteristics are distinguishable, but their details are weak, and they tend to merge into larger patterns. In the distant part of the landscape, the background, details and colors of objects are not normally discernible unless they are especially large, standing alone, or have a substantial color contrast. In this assessment the background is measured as 4 to 10 mi from the observer. Visual and aesthetic impacts associated with a particular action may occur as a result of the introduction of a feature that is not consistent with the existing viewshed. Consequently, the character of an existing site is an important factor in evaluating potential visual impacts.

For this analysis, the affected environment includes the proposed decontamination and deconstruction project area, laydown areas, and light use area, as well as the physical and biological features of the landscape. The existing ALF facility is located in an industrial region on the south end of Memphis. The surrounding topography ranges from gently sloping near the banks of the Mississippi River and McKellar Lake to moderately sloping at T.O. Fuller State Park to the east. Industrial activities including the ACT, Nucor Steel, Electrolux, the Maxson WWTP, CN/CSX Intermodal facility, the ACC Plant, and the City of Memphis Earth Complex are visible to the south of the proposed project area at ALF, as part of the Frank C. Pidgeon Industrial Park. Forested areas within T.O. Fuller State Park are visible to the east and southeast. To the north of the proposed demolition boundary area, across McKellar Lake, is a mix of undeveloped land and industrial developments associated with the International Port of Memphis.

The three existing ALF stacks, the powerhouse, and the existing transmission lines leaving the plant site are the dominant elements in the landscape that are visible to motorists on nearby roadways within the foreground and middleground. Within the immediate vicinity of the plant site, the landscape character is distinctly industrial. Based on the above characteristics, the scenic attractiveness of the affected environment is considered to be minimal to common, whereas the scenic integrity is considered to be low. The rating for scenic attractiveness is due to the ordinary or common visual quality. The scenic integrity has been lowered by the industrial nature of the surrounding area. However, in the background these alterations are not substantive enough to dominate the view of the landscape. Based on the criteria used for this analysis, the overall scenic value class for the affected environment is considered to be fair.

3.11.2 Environmental Consequences

3.11.2.1 Alternative D1 – Full Demolition of Units 1, 2 and 3 and Related Structures Resulting in a Brownfield Site, Drop Removal of Stacks and Structures

Minor visual impacts may occur during decontamination and deconstruction of the facilities. During the decontamination and deconstruction phase of the proposed project, there would be additional visual discord due to an increase in personnel and equipment in the area. Impacts from additional vehicular traffic are expected to be insignificant as the roads are already predominately used for industrial activity. This increase in visual discord would be temporary and only last until all activities have been completed by TVA.

Although only the stacks are visible from most vantage points in the area, cranes and other tall and colorful equipment may be visible at ALF during deconstruction activities. Observers from McKellar Lake would most likely be able to see the construction equipment

operating at the stacks, barge unloader and mooring cells, and the coal handling facilities as these are tall and/or near the lake. Because of the screening effect of terrain associated with the forested bluff line, visibility of the proposed project site by residents southeast of the proposed plant site is expected to be very limited. As potential visual disturbances would only be visible to a few people and due to the temporary nature of the activities, visual impacts during demolition of the facilities would be considered minor.

Removal of the ALF stacks and structures under Alternative D1 would enhance the visual environment of both the fore- and middleground distances. The stacks and powerhouse are visible as a major visual intrusion from only a few locations, the industrial areas surrounding the facility and from McKellar Lake and the industrial areas across the lake. The overall impacts of this alternative would be beneficial, but minor due to the limited number of observers in the area around ALF.

3.11.2.2 Alternative D2 – Full Demolition of Units 1, 2 and 3 and Related Structures Resulting in a Brownfield Site, Mechanical Removal of Stacks and Structures

Impacts to visual resources under Alternative D2 would be the same as those described for Alternative D1 and would be beneficial, but minor.

3.11.2.3 Alternative D3 – Full Demolition of Units 1, 2 and 3 and Related Structures Resulting in a Brownfield Site, Hybrid Removal of Stacks and Structures

Impacts to visual resources under Alternative D3 would be the same as those described for Alternative D1 and would be beneficial, but minor.

3.11.2.4 Alternative E – No Action

Under the No Action Alternative, no construction or deconstruction activities would occur and there would be no impact to visual resources. As TVA would only perform critical maintenance as needed, minor adverse impacts to visual resources would occur over time as the buildings at ALF begin to deteriorate.

3.12 Cultural and Historic Resources

3.12.1 Affected Environment

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 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.

The Area of Potential Effect (APE) is defined at 36 CFR §800.16(d) (a section of the federal regulations implementing Section 106 of the NHPA) as “the geographic area or areas within which an undertaking may directly or indirectly cause alterations in the character or use of historic properties, if any such properties exist.” TVA has determined that APE for the proposed project consists of all areas that would be directly affected by decontamination and deconstruction. This is the area indicated as “decontamination and deconstruction project area boundary” and proposed laydown and light use areas shown in Figure 1-2. With regards to cultural resources, the APE will be considered as the affected environment for purposes of this EA. As the project would not include any new construction, TVA does not consider the ALF decontamination and deconstruction project to have potential for

indirect effects on any above-ground historic structures that may be present in the viewshed. TVA completed a cultural resources survey of ALF in 2014, which included an architectural assessment. Based on that assessment, TVA and the Tennessee SHPO agreed that ALF is ineligible for inclusion in the National Register of Historic Places (NRHP) as an above-ground resource. SHPO's agreement with this finding is documented in their letter dated to TVA July 9, 2014 (Appendix C).

The decontamination and deconstruction boundary portion of the APE has not been included in any previous archaeological survey, and no archaeological sites have been identified previously within this part of the APE. Nearly the entire decontamination and deconstruction boundary portion of the APE is covered with asphalt, concrete, or buildings, making it impossible to investigate using conventional survey techniques. In order to evaluate the potential for intact archaeological sites in the APE, TVA Cultural Compliance staff relied on background information relating to the APE's geology and history of development. TVA reviewed geological maps, historic maps, TVA's engineering report on the construction of ALF, soil maps available through the USDA NRCS's Web Soil Survey (USDA NRCS 2019a), and current satellite imagery available through Environmental Systems Research Institute ArcGIS.

These sources indicate that the decontamination and deconstruction project area was within the main channel of the Mississippi River from 1765 through at least 1880 (Fisk 1944). At some time after 1880 the Mississippi River channel migrated west, leaving the decontamination and deconstruction boundary portion of the APE above normal river flow levels but within the flood zone. In the 1920s the APE was characterized as "subject to overflow by Mississippi River" and as consisting of unconsolidated alluvial silts and sands (USGS 1925). This geologic history precludes the presence of soils or natural deposits pre-dating 1765 in the decontamination and deconstruction boundary APE; most soils and natural deposits in the APE are likely younger than 100 years. Given this geologic history, the likelihood of human habitation in the APE between the mid-eighteenth century and 1956, when construction on ALF began, is very low. In addition, much of the decontamination and deconstruction boundary portion of the APE, including the dikes surrounding ALF impoundments and land along McKellar Lake, consists of artificial lands created in the mid- to late-20th century from dredge spoils (Moore and Diehl 2004).

ALF construction required extensive grading. An area of 200,000 cubic yards was excavated for the plant; the project required 3,784,116 cubic yards of construction fill and 53,252 cubic yards of concrete (TVA 1968). Additional construction activities have taken place in the past six decades, including construction of the ash precipitators, a power stores building, a new crusher house, security buildings, sheds, a hazardous materials building, and a dozer garage. Therefore, TVA finds that the potential for intact archaeological sites in the decontamination and deconstruction project area is extremely low. TVA consulted with the Tennessee SHPO and federally-recognized Indian tribes on October 24, 2018. The SHPO concurred with TVA's findings in a letter dated November 1, 2018 (Appendix C).

TVA also consulted with the SHPO on previous projects at ALF that included areas containing laydown areas 1 and 4 and the light use area. These areas are surfaced in asphalt or graded and surfaced with gravel. The light use area is located within the parking lot of the recently constructed ACC Plant. Laydown area 4 is located in an area that does not appear to have been affected by previous ground-disturbing activities. TVA has previously conducted a Phase I archaeological survey of this area. This investigation included a pedestrian survey and systematic shovel testing and was conducted by

professional archaeologists. Background research conducted prior to the field investigation indicated that no archaeological sites have been recorded previously in this proposed laydown area. The field investigation identified no archaeological sites. The SHPO concurred with TVA's findings on these areas in letters dated July 9, 2014 and July 7, 2017 (Appendix C).

Laydown area 2 is located in the former coal yard, which was graded and compacted during ALF construction and has been compacted further by the use of heavy equipment over the past several decades. Laydown area 3 is also surfaced in asphalt and previously disturbed. Given the low potential for such areas to contain archaeological sites and the previous effects that grading, surfacing, and coal operations have had, TVA finds that these two areas have very low potential for the presence of archaeological sites that are eligible for the NRHP. The SHPO concurred with TVA's findings on these areas in a letter dated February 21, 2019 (Appendix C).

3.12.2 Environmental Consequences

3.12.2.1 Alternative D1 – Full Demolition of Units 1, 2 and 3 and Related Structures Resulting in a Brownfield Site, Drop Removal of Stacks and Structures

As there are no archaeological resources located within the proposed decontamination and deconstruction project area portion of the APE, Alternative D1 would not result in effects on any NRHP-eligible archaeological site. Use of the proposed temporary laydown areas 1, 2, and 3 and the light use area would not result in significant ground disturbance. TVA does not consider the temporary use of laydown yards on paved, graveled, compacted or fill-covered surfaces to have potential to result in adverse effects on archaeological sites. As there are no archaeological sites at proposed temporary laydown area 4 and the light use area there would be no adverse effects to archaeological sites. TVA has determined, in consultation with SHPO, that no historic architectural resources included or eligible for inclusion in the NRHP are located within the decontamination and deconstruction area, laydown areas, and the light use area or its viewshed (Appendix C).

Borrow would be obtained from one or more previously developed or permitted commercial borrow site(s) within 30 miles of ALF. No specific site has been identified at this time and ultimate site selection would be left up to the contractor. However, TVA would perform all necessary due diligence and consultation as required under Section 106 of the NHPA related to any offsite work. Therefore, TVA finds that the undertaking as currently proposed would not affect historic properties.

3.12.2.2 Alternative D2 – Full Demolition of Units 1, 2 and 3 and Related Structures Resulting in a Brownfield Site, Mechanical Removal of Stacks and Structures

Under Alternative D2, impacts to cultural and historic resources would be the same as those described above for Alternative D1.

3.12.2.3 Alternative D3 – Full Demolition of Units 1, 2 and 3 and Related Structures Resulting in a Brownfield Site, Hybrid Removal of Stacks and Structures

Under Alternative D3, impacts to cultural and historic resources would be the same as those described for Alternative D1.

3.12.2.4 Alternative E – No Action

Under the Alternative E, the areas within the proposed decontamination and deconstruction project area, laydown areas, and light use area would remain in their current condition. As a result, adoption of the No Action Alternative would not affect any cultural and historic resources because no project related activities would occur.

3.13 Land Use

3.13.1 Affected Environment

ALF is located in the southwest portion of the city of Memphis in Shelby County, Tennessee. It is located within the Frank C. Pidgeon Industrial Park, which has been zoned for heavy industrial use by both the city of Memphis and Shelby County (Memphis City Council 1981; City of Memphis and Shelby County 2010). According to the Memphis and Shelby County zoning code, a heavy industrial district is intended to accommodate high-impact manufacturing, industrial or other uses, that by their nature create some nuisance, and which are not properly associated with or are compatible with nearby residential districts or other less intense mixed use or industrial districts (Memphis and Shelby County 2010). Current uses of the Frank C. Pidgeon Industrial Park include manufacturing, sewage and wastewater treatment and intermodal freight transportation. In addition, the International Port of Memphis is located on the opposite side of McKellar Lake at Presidents Island and consists of 37 water-fronted terminal facilities moving products such as petroleum, tar, asphalt, cement, steel, coal, salt, fertilizers, rock, and grain (International Port of Memphis 2019a).

No residential or commercial land uses occur in the immediate vicinity of ALF. The nearest single-family residential areas occur approximately 1.5 miles to the southeast of the proposed project areas.

The area for this evaluation consists of approximately 121.9 acres on which decontamination and deconstruction activities may take place shown on Figure 1-2 and Table 3-1 (the 49.6-acre decontamination and deconstruction project area, four laydown areas, and one light use area). The project area and laydown areas 1 through 3 are located within the ALF property boundary and are characterized by industrial development. Laydown area 4 consists of approximately 46.1 acres of undeveloped, mowed herbaceous land and the light use area consists of a gravel parking lot located on the ACC Plant property.

3.13.2 Environmental Consequences

3.13.2.1 Alternative D1 – Full Demolition of Units 1, 2 and 3 and Related Structures Resulting in a Brownfield Site, Drop Removal of Stacks and Structures

Under Alternative D1, all buildings, structures, conveyers, and tunnels associated with the coal plant operations, identified in the decontamination and deconstruction project area in Figure 2-2, would be decontaminated and demolished to 3 feet below final grade, resulting in a brownfield site. All disturbed areas would be backfilled and re-seeded or otherwise stabilized. The land use would be changed from a developed, industrial use to a vacant vegetated area. It would become available for potential redevelopment, allowing for future industrial or other economically beneficial use. While the extent of the potential future development is unknown, it is assumed that any future development would comply with

uses allowed under the current zoning designation. No adverse impacts to land use within the proposed project area are anticipated under Alternative D1.

Deconstruction activities would also result in short term land use impacts associated with the temporary conversion of land for the purposes of laydown areas and a light use area to support various demolition-related activities. These short term impacts would include the utilization of new construction parking lots, laydown and stockpile areas, and temporary crew trailers and offices. Upon completion of deconstruction activities, it is anticipated that these areas would be restored to their previous state. Therefore, land use impacts in the laydown areas and light use area are anticipated to be short term and minor.

Demolition debris removed from the decontamination and deconstruction project area would be transported to an existing offsite permitted landfill or to an offsite recycling facility. Additionally, fill material used during site restoration would be obtained from a previously permitted offsite borrow area. Therefore, there would be no changes to existing land use at the disposal or borrow sites. The haul routes to the offsite landfill and borrow area would utilize previously constructed roads which are already subjected to vehicular traffic and no new roads would need to be constructed. Therefore, there would be no indirect impacts to land use associated with disposal of demolition debris or obtaining and transporting borrow material to ALF.

3.13.2.2 Alternative D2 – Full Demolition of Units 1, 2 and 3 and Related Structures Resulting in a Brownfield Site, Mechanical Removal of Stacks and Structures

Under Alternative D2, impacts to land use would be the same as those described above for Alternative D1 and would be short term and minor.

3.13.2.3 Alternative D3 – Full Demolition of Units 1, 2 and 3 and Related Structures Resulting in a Brownfield Site, Hybrid Removal of Stacks and Structures

Under Alternative D3, impacts to land use would be the same as those described above for Alternative D1 and would be short term and minor.

3.13.2.4 Alternative E – No Action

Under the No Action Alternative, TVA would not perform any decontamination, deconstruction or other disposition activities and the site would remain in its current condition. Therefore, there would be no changes in land use.

3.14 Prime Farmland

3.14.1 Affected Environment

The 1981 Farmland Protection Policy Act (7 CFR Part 658) requires all federal agencies to evaluate impacts to prime and unique farmland prior to permanently converting to land use incompatible with agriculture. Prime farmland soils have the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops. These characteristics allow prime farmland soils to produce the highest yields with minimal expenditure of energy and economic resources. In general, prime farmlands have an adequate and dependable water supply, a favorable temperature and growing season, acceptable acidity or alkalinity, acceptable salt and sodium content, and few or no rocks. Prime farmland soils are permeable to water and air, not excessively erodible or saturated for extended period, and are protected from frequent flooding.

Prime farmland soils within the proposed decontamination and deconstruction project area and within a 5-mile radius of ALF are summarized in Table 3-4. Of the 121.9 acres that make up the proposed project area, four laydown areas, and light use area, approximately 50.1 acres (41 percent of the total area) are considered prime farmland soils. Prime farmland within these areas consists of Commerce silt loam, Robinsonville fine sandy loam, and Robinsonville silt loam (USDA NRCS 2019a). Overall, the prime farmland soils within the proposed project area, laydown areas, and light use area comprise 0.25 percent of the total prime farmland soils found within a 5-mile radius of the project area.

Table 3-4. Acres of Prime Farmland Soils Mapped Within the Decontamination and Deconstruction Project Area, Laydown Areas, and Light Use Area

	Prime Farmland Soils (acres)	Non-Prime Farmland Soils (acres)	Total Acreage
Decontamination and Deconstruction Project Area	4.4	45.2	49.6
Laydown Area 1	6.5	0	6.5
Laydown Area 2	0	12.0	12.0
Laydown Area 3	0	2.4	2.4
Laydown Area 4	33.8	12.3	46.1
Light Use Area	5.4	0	5.4
Total	50.1	71.8	121.9
Shelby County, within 5-Mile Radius of ALF	20,030.2	18,003.6	38,773.1*

Source: USDA NRCS 2019a

*Includes 739.3 acres that are not classified as either Prime Farmland or Non-Prime Farmland Soils, as no digital data was available

Although some of the soils within the proposed decontamination and deconstruction project area, laydown areas, and light use area have the physical characteristics of prime farmland, the sites have been zoned for industrial use, thereby removing them from the prime farmland category under the Farmland Protection Policy Act and its implementing regulations.

3.14.2 Environmental Consequences

3.14.2.1 Alternative D1 – Full Demolition of Units 1, 2 and 3 and Related Structures Resulting in a Brownfield Site, Drop Removal of Stacks and Structures

Based on NRCS soil mapping, there are a total of approximately 50.1 acres of prime farmland with the potential to be impacted by the proposed project. However, the 4.4 acres of prime farmland soils mapped within the proposed decontamination and deconstruction project area and the 6.5 acres mapped within Laydown Area 1 have previously been impacted by the construction and operation of existing ALF facilities and therefore, would no longer be considered prime farmland. Similarly, the 5.4 acres of prime farmland soils mapped within the light use area have previously been converted to a parking area associated with the ACC Plant, and would no longer be considered prime farmland.

Laydown area 4 is currently undeveloped, and 33.8 acres within this area are considered prime farmland. Under Alternative D1, impacts to laydown area 4 would be temporary and would not include substantial ground disturbance activities. Upon completion of the decontamination and deconstruction activities, the area would be restored to the original

condition. Furthermore, the area is included in the Frank C. Pidgeon Industrial Park which has been zoned for industrial use, thereby removing it from the prime farmland category under the Farmland Protection Policy Act and its implementing regulations. Impacts to prime farmland under Alternative D1 would be insignificant due to the short term nature of the actions, the minimal acreage affected, and the zoning of the land for industrial use.

3.14.2.2 Alternative D2 – Full Demolition of Units 1, 2 and 3 and Related Structures Resulting in a Brownfield Site, Mechanical Removal of Stacks and Structures

Under Alternative D2, impacts to prime farmland would be the same as those described above for Alternative D1. Therefore, there would be no impacts to prime farmland.

3.14.2.3 Alternative D3 – Full Demolition of Units 1, 2 and 3 and Related Structures Resulting in a Brownfield Site, Hybrid Removal of Stacks and Structures

Under Alternative D3, impacts to prime farmland would be the same as those described above for Alternative D1. Therefore, there would be no impacts to prime farmland.

3.14.2.4 Alternative E – No Action

Under the No Action Alternative, TVA would not perform any decontamination, deconstruction or other disposition activities and the site would remain in its current condition. Therefore, there would be no impacts to prime farmland.

3.15 Transportation

3.15.1 Affected Environment

ALF is located within the Frank C. Pidgeon Industrial Park which is served by highway, railway and waterway modes of transportation.

3.15.1.1 Roadways

Major traffic generators within the Frank C. Pidgeon Industrial Park include Nucor Steel, Electrolux Corporation, ALF, and the CSX intermodal facility. Traffic generated by these facilities is composed of a mix of cars and light duty trucks (such as a Fedex trucks), as well as medium duty (larger delivery trucks) to heavy duty trucks (semi-tractor trailers).

Two service interchanges provide access to ALF from Interstate 55 (Interstate 55). One is at West Mallory Avenue (a Single-Point Urban Interchange), the other is a partial (half-diamond) interchange at Kansas Street. The access at Kansas Street is to/from the west only. From Kansas Street, Rivergate Drive provides access between Kansas Street and Riverport Road (also known as Paul R. Lowry Road, hereinafter referred to as Riverport Road) From West Mallory Avenue, Riverport Road provides direct truck and automobile access to ALF. Riverport Road varies from two to four lanes, whereas Rivergate Drive is two lanes. Table 3-5 presents the 2017 Average Annual Daily Traffic measured in vehicles per day (veh/day) counts for roadways in the vicinity of ALF. Primary routes to ALF are shown on Figures 1-1 and 1-2.

Table 3-5. Average Annual Daily Traffic Counts of Roadways in the Vicinity of ALF

Roadway	2017 Average Daily Vehicle Use (veh/day) ¹	Number of Lanes	Existing Level of Service ²
Riverport Rd. between ALF and Rivergate Dr.	9,952	4	A
Riverport Rd. just south of W. Mallory	9,484	4	A
Kansas St. S. of I55	11,335	4	A
Interstate 55 between W. Mallory and Kansas St.	63,203	6	C

¹ Source: TDOT 2019² Source: TRB 2008

Levels of service (LOS) on the roadways in the vicinity of ALF calculated for 2017 ranged from LOS A to LOS C. LOS is a quality measure describing operational conditions within a traffic stream, generally in terms of such service measures as speed and travel time, freedom to maneuver, traffic interruptions, and comfort and convenience. LOS is described accordingly:

- LOS A: describes free flow traffic conditions;
- LOS B: free flow conditions although presence of other vehicles begins to be noticeable;
- LOS C: increases in traffic density become noticeable but remain tolerable to the motorist;
- LOS D: borders on unstable traffic flow; the ability to maneuver becomes restricted; delays are experienced;
- LOS E: traffic operations are at capacity; travel speeds are reduced, ability to maneuver is not possible; travel delays are expected; and
- LOS F designates traffic flow breakdown where the traffic demand exceeds the capacity of the roadway; traffic can be at a standstill.

3.15.1.2 Railway

ALF is served by a variety of rail lines that traverse the Memphis area. The Canadian Railroad operates rail line which directly serves ALF (CN 2019). This line runs east from ALF, parallel and to the north of Riverport Road, for approximately 2 miles where it crosses to the south of the road. From there it continues eastward on the south side of the road for approximately 1.5 miles where it reaches the Canadian National Harrison Yard, which has access to several carriers that serve destinations throughout the country.

3.15.1.3 Barge

The ALF barge unloading area is located on McKellar Lake, which has direct access to the Mississippi River. When in operation, ALF received coal deliveries by barge. Currently ACT receives fuel oil by barge. The barge facilities at ALF are not configured with an intermodal terminal or loading systems that would be required to handle demolition debris and/or construction equipment.

3.15.2 Environmental Consequences

3.15.2.1 Alternative D1 – Full Demolition of Units 1, 2 and 3 and Related Structures Resulting in a Brownfield Site, Drop Removal of Stacks and Structures

Alternative D1 would involve removal of potential contaminant sources and removal of structures within the project site. Traffic generated by these activities would consist of the shipment of goods and equipment, the construction workforce, transport of demolition debris from the facility to an offsite landfill or recycling operation, and transport of borrow material from an offsite location to the project site.

The construction workforce traveling to and from ALF would contribute to the traffic on the local transportation network. TVA estimates that the workforce needed for decontamination would range in size from 40 to 150 personnel over a 12 to 18-month period. The deconstruction workforce of approximately 50 personnel would be needed for approximately 12 months which could overlap the decontamination work phase. Assuming one person per commuting vehicle, there would be a daily morning inbound traffic volume of up to 200 vehicles and a daily outbound traffic volume of up to 200 vehicles per day. The traffic volume generated by the construction workforce would be relatively minor and would only occur for up to 18 months. Further, it is assumed that these motorists would disperse throughout the transportation network and use interstate highways or major arterial roadways as much as possible.

Construction-related vehicles (dozers, cranes, backhoes, graders, loaders, etc.) would be delivered to the decontamination and deconstruction area on flatbed trailers during both the mobilization and demobilization stages of the project, causing an increase in truck traffic in the vicinity. However, as this increase would primarily occur during the mobilization and demobilization phases, impacts to the surrounding transportation network are not anticipated. Barges could be used for hauling construction equipment and/or debris; however, unloading would have to occur at the adjacent USACE unloading area or a nearby port. Given the hauling capability of individual barges and the short duration of construction mobilization, the use of barges to transport construction equipment would not appreciably change the existing level of barge traffic in the area.

Alternative D1 could result in approximately 17,000 cubic yards of demolition debris and ACM, and 69,000 cubic yards of scrap metal, that would need to be hauled from ALF and disposed in accordance with all federal, state, and local regulations. Scrap metal could also be sold to a local or regional vendor and hauled offsite. Masonry debris would be used for fill material for the basements at the site with any excess hauled to an offsite landfill or recycling facility by truck, rail, or barge to one or more previously permitted commercial landfills. Material could also be hauled to an offsite hazardous waste landfill. If hauled by truck, TVA estimates that 15 trucks per day would utilize local roads and arterial and interstate highways to transport demolition debris to a permitted landfill within 30 miles of ALF (reasonable trucking distance from ALF) during the decontamination and deconstruction phase, equating to a temporary (18 months) increased daily traffic count of 30 truck trips in the vicinity of the ALF site. Barges could be used for hauling scrap demolition debris and scrap metal; however, barge loading would have to occur at the adjacent USACE loading area or a nearby port. Given the hauling capability of individual barges, the use of barges to transport demolition materials would not appreciably change the existing level of barge traffic in the area.

Road traffic on Interstate 55 and other roads in the vicinity of ALF could experience minor delays due to the hauling of debris. The existing levels of service on all of the roads that would likely be utilized are LOS A, except for Interstate 55, which is LOS C. Anticipated traffic increases from transport of demolition debris are shown in Table 3-6. The extent of additional truck trips is minor, with forecasted traffic increases of less than 1 percent on area roadways. These additional trips are within the threshold for existing levels of service and would not result in a degradation of service levels.

Table 3-6. Traffic Impacts Associated with Alternative D1

Roadway	2017 Traffic ¹ (AADT)	Existing Traffic Plus Demolition Debris Phase Traffic (AADT)	Traffic Increase (Percent)
Riverport Rd. between ALF and Rivergate Dr.	9,952	9,982	0.30
Riverport Rd. just south of W. Mallory	9,484	9,514	0.32
Kansas St. S. of I-55	11,335	11,365	0.27
I-55 between W. Mallory and Kansas St.	63,203	63,233	0.05

¹ Source: TDOT 2019

Potential disruption of traffic on Riverport Road may occur as a result of heavy construction traffic. The construction traffic coupled with existing truck traffic accessing other areas within the Frank C. Pidgeon Industrial Park could result in congestion along Riverport Road during peak hours of the day. Ingress/egress turning movements of construction traffic at ALF may at times be difficult and lead to unsafe conditions especially during peak hours. However, traffic impacts could be mitigated by timing of entry and exit to the facility, managing access to ALF to include both Plant Road and Riverport Road, and possible busing of workers if necessary. The transport of borrow material to ALF to support site restoration activities would occur after decontamination and deconstruction is complete (12 months). Borrow would be hauled by truck from one or more previously permitted commercial sites within 30 miles of ALF. TVA estimates that 80 to 180 truckloads of borrow per day would be required to transport borrow material to ALF when borrow is needed, equating to up to 360 additional truck trips on roads and highways in the vicinity of ALF. Although the exact location of borrow sites is not known, it is assumed that haul routes would use arterial or interstate roadways whenever possible. It may be necessary for some routes to utilize local roads in the vicinity of ALF. However, the transport of borrow is intermittent in nature and not expected to result in heavy volumes of traffic for extended periods of time.

Should barges or rail be utilized, given hauling capability of individual barges and rail cars and the frequency of barge and rail traffic in the area, and the expected waste quantities, impacts to the river and railroad transportation networks would not be anticipated from the proposed actions.

Under Alternative D1, the stacks and certain structures would be demolished via explosives, the use of which would necessitate increased security measures that would affect transportation in the immediate vicinity of the project site. During blasting events, select public roadways could be closed for public safety and to facilitate site security. River traffic would be restricted as well due to the potential for demolition debris to fall into the river. Traffic closures would vary from approximately 3 hours before and up to 3 hours after

the blast. The closures would not affect a large number of local residents due to the sparse population in the area. The demolition contractor would create a detailed plan for road closures that would be coordinated with affected parties, including emergency personnel.

Therefore, given the localized impact associated with increased traffic on Riverport Road, temporary nature of construction, and implementation of mitigation measures to address ingress/egress from ALF, the impact of this alternative on transportation would be moderate.

3.15.2.2 Alternative D2 – Full Demolition of Units 1, 2 and 3 and Related Structures Resulting in a Brownfield Site, Mechanical Removal of Stacks and Structures

Under Alternative D2, impacts to transportation would be the same as those described for Alternative D1 and would be moderate; however, due to the mechanical removal of the stacks and structures, increased security measures and potential road closures would not be necessary during stack demolition.

3.15.2.3 Alternative D3 – Full Demolition of Units 1, 2 and 3 and Related Structures Resulting in a Brownfield Site, Hybrid Removal of Stacks and Structures

Under Alternative D3, impacts to transportation would be the same as those described for Alternative D1 and would be moderate.

3.15.2.4 Alternative E – No Action

Under the Alternative E, TVA would not perform any decontamination or deconstruction activities. As the ALF plant would be left in place in its current condition, there would be no effect on traffic and transportation in proximity to the site.

3.16 Managed and Natural Areas

3.16.1 Affected Environment

Natural areas include managed areas such as Wildlife Management Areas, National Wildlife Refuges and Habitat Protection Areas, ecologically significant sites, and Nationwide Rivers Inventory streams. Managed areas include lands held in public ownership that are managed by an entity (e.g., TVA, National Park Service, U.S. Forest Service, state or county) to protect and maintain certain ecological and/or recreational features. Ecologically significant sites are tracts of privately-owned land that are recognized by resource biologists as having significant environmental resources or identified tracts on TVA lands that are ecologically significant, but not specifically managed by TVA's Natural Areas Program. The Nationwide Rivers Inventory is a listing of more than 3,200 free-flowing river segments in the United States that are believed to possess one or more outstandingly remarkable natural or cultural values judged to be of more than local or regional significance. Designated Nationwide Rivers Inventory segments are thus potential candidates for inclusion in the federally recognized National Wild and Scenic River System.

This section addresses managed and natural areas that are on, immediately adjacent to (within a 0.5-mile radius), or within the region of the proposed decontamination and deconstruction project area (within a 5-mile radius). As noted in Table 3-7 and illustrated on Figure 3-2, several managed and natural areas are located in the region around ALF. There are no Nationwide Rivers Inventory streams or Wild and Scenic Rivers present in the region.

There are no managed or natural areas present within the proposed decontamination and deconstruction project area, laydown areas, or light use area with the exception of the Ensley Bottoms Complex, an ecologically significant site. All of the project areas are included within the boundaries of the Ensley Bottoms Complex, which is part of the Mississippi Alluvial Valley Important Bird Area. Important Bird Areas in Tennessee are designated by the TWRA, partnered with the National Audubon Society's Audubon Important Bird Area program, and are identified as being important for the conservation of bird populations.

Table 3-7. Natural and Managed Areas Within 5 Miles of the Decontamination and Deconstruction Project Area

Natural Area	Managing Agency	Distance from the Proposed Project Areas
Ensley Bottoms Complex	Tennessee Wildlife Resources Agency	Encompasses ALF and proposed laydown and light use areas
Presidents Island Wildlife Management Area	Tennessee Wildlife Resources Agency	0.7 mile
939.2-acre Wetlands Reserve Program Conservation Easement	Private Ownership with easement held by Natural Resources Conservation Service (NRCS)	2.1 miles
1,313.8-acre Wetlands Reserve Program Conservation Easement	Private Ownership with easement held by NRCS	4.6 miles

Sources: TVA 2018; Tennessee Wildlife Resources Agency 2019; National Conservation Easement Database 2019

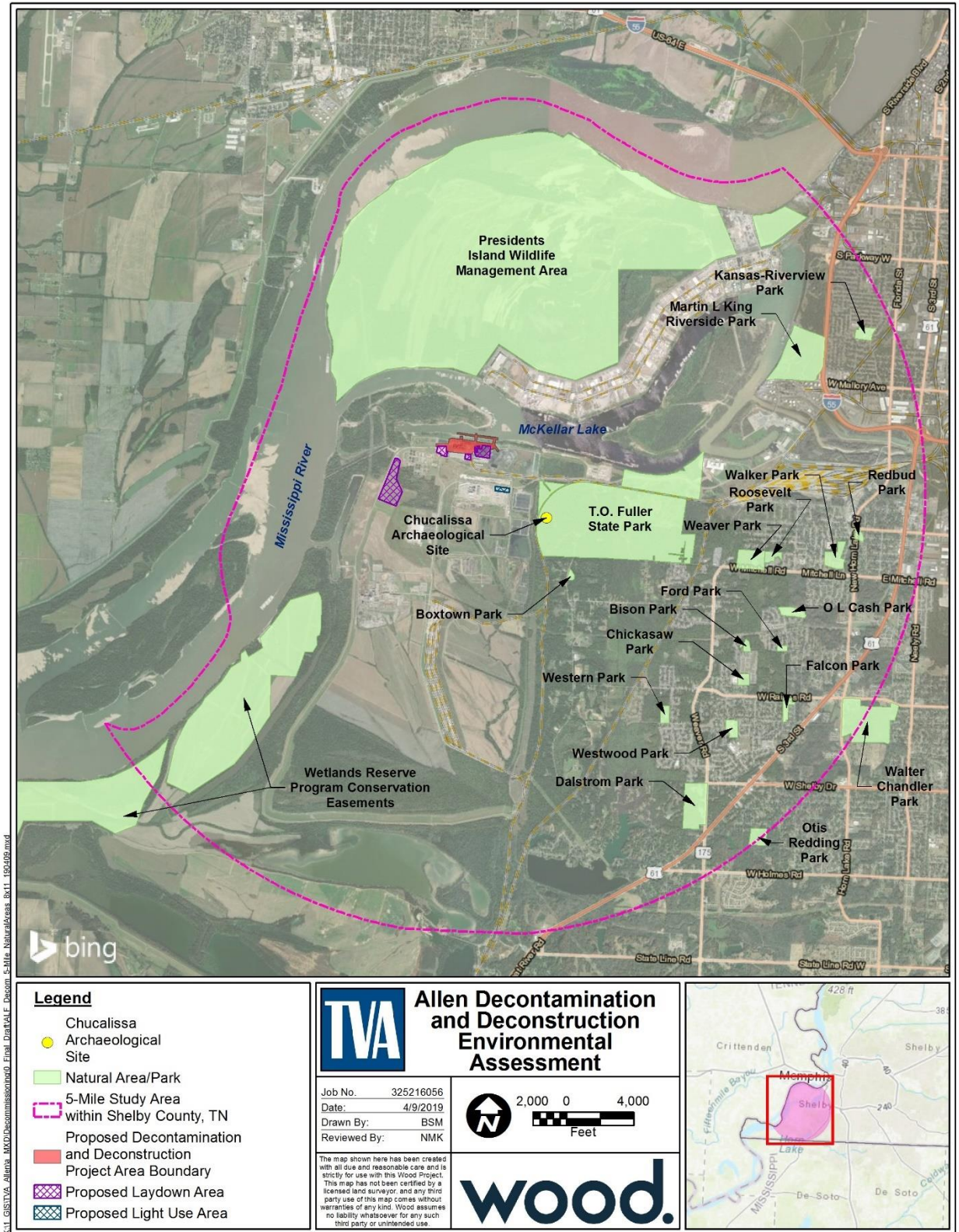


Figure 3-2. Natural Areas, Parks, and Recreation Facilities within 5 Miles of the Decontamination and Deconstruction Project Area

The Ensley Bottoms Complex is described as containing sludge treatment ponds, fields for drying sludge, some agricultural experimental plots, industrial areas, agricultural fields, lakes, grasslands, and bottomland forest, and includes the ALF ash impoundments, McKellar Lake, Presidents Island north of McKellar Lake, T. O. Fuller State Park, the T.E. Maxson Waste Water Treatment Plant, and other public and private lands in the vicinity of ALF. One of the few breeding populations of painted buntings in Tennessee is found in the Ensley Bottoms Complex, in the scrubby forested lands west of ALF and just south of the plant (TN IBA 2018; eBird 2018). According to the Tennessee Important Bird Area Program website, the Ensley Bottoms complex is also the most important shorebird site in Tennessee and one of the most important inland shorebird sites in the southeast (TN IBA 2018).

Presidents Island Wildlife Management Area, managed by TWRA, is located north of ALF on the opposite side of McKellar Lake. The 6,300-acre Wildlife Management Area allows deer hunting with archery equipment during authorized times of the year and is also a popular area for bird watching (TWRA 2018a; TWRA 2019b).

Southwest of ALF and located along the eastern bank of the Mississippi River, there are two privately owned properties that have conservation easements held by the NRCS through enrollment in the Wetlands Reserve Program. The Wetlands Reserve Program is a voluntary program that offers landowners the opportunity to protect, restore, and enhance wetlands on their property with technical and financial support from NRCS, in exchange for retiring eligible land from agriculture (USDA NRCS 2019b). Together, the two Wetlands Reserve Program conservation easements in the region of the proposed project encompass 2,253 acres (NCED 2019).

3.16.2 Environmental Consequences

3.16.2.1 Alternative D1 – Full Demolition of Units 1, 2 and 3 and Related Structures Resulting in a Brownfield Site, Drop Removal of Stacks and Structures

Under Alternative D1, deconstruction of the project site would have a direct impact on the Ensley Bottoms Complex, as ALF is located within the boundaries of this Important Bird Area. The decontamination and deconstruction activities would likely result in a temporary displacement of birds in the immediate vicinity of ALF due to the disruptive noise, fugitive dust, and heavy machinery operation associated with demolition activities. However, the project area itself is heavily developed, provides little to no suitable habitat for bird species, and is not an area where significant numbers of birds have been known to flock. The majority of the temporary laydown areas are also previously developed, and none contain ponds or wetland habitat where the majority of shorebird species are typically found. The Ensley Bottoms Complex Important Bird Area covers a large area, most of which would remain unaffected by project activities. As the birds, and those who bird watch recreationally, would be able to relocate to other areas of the complex during the deconstruction activities, and as the area impacted by deconstruction does not provide optimal habitat for shorebirds, direct impacts to the Ensley Bottoms Complex under Alternative D1 are anticipated to be minor.

For all remaining managed and natural areas in the region, there would be no direct or indirect impacts from onsite decontamination and deconstruction activities given the existing industrial setting of the project location and the distance between the managed and natural areas and the proposed project area.

Under Alternative D1, demolition debris and scrap metal would be hauled to an offsite landfill or recycling facility by truck, rail or barge. Removal and transport of this material would require the use of up to 15 truckloads (30 truck trips) per day for approximately 18 months. In addition, up to 180 truckloads (360 truck trips) per day would be needed to transport borrow material to ALF. Transport of borrow material would occur intermittently to support restoration activities over a period of approximately 12 months. The exact haul routes for demolition debris and borrow material are not known. While haul routes would use arterial or interstate roadways whenever possible, it may be necessary for some routes to utilize local roads within the vicinity of ALF. Therefore, there is potential for indirect impacts to managed and natural areas within the vicinity of ALF associated with increased traffic, noise, and potential fugitive dust from the transport vehicles during the deconstruction and site restoration phases. The impact would be negligible to managed areas along arterial and interstate roadways where the additional truck traffic would not have a substantial impact on existing traffic volume, or consequently, traffic noise or fugitive dust emissions. On the lower functioning roadways closest to ALF, increased traffic would be temporary and would likely resemble traffic patterns that were present when the plant was operational. Due to the short term nature of the transport of demolition debris offsite and temporary and intermittent nature of the transport of borrow material onsite, indirect impacts to managed and natural areas under Alternative D1 would be short term and minor.

Transport of demolition debris and scrap metal by rail or barge would be along existing rail lines and waterways and would be integrated within the existing rail freight system and waterways. As such potential effects to managed and natural areas from the transport of debris from ALF are not anticipated.

3.16.2.2 Alternative D2 – Full Demolition of Units 1, 2 and 3 and Related Structures Resulting in a Brownfield Site, Mechanical Removal of Stacks and Structures

Under Alternative D2, impacts to managed and natural areas would be the same as those described above for Alternative D1 and would be short term and minor.

3.16.2.3 Alternative D3 – Full Demolition of Units 1, 2 and 3 and Related Structures Resulting in a Brownfield Site, Hybrid Removal of Stacks and Structures

Under Alternative D3, impacts to managed and natural areas would be the same as those described above for Alternative D1 and would be short term and minor.

3.16.2.4 Alternative E – No Action

Under the No Action Alternative, TVA would not perform any deconstruction or other disposition activities at ALF and the project area and vicinity would remain in its current condition. No impacts to natural areas or parks would be anticipated should the No Action alternative be selected.

3.17 Parks and Recreation

3.17.1 Affected Environment

Parks and developed recreation facilities include open areas, boat ramps, community centers, swimming pools, and other public places. This section addresses parks and recreation facilities that are on, immediately adjacent to (within a 0.5-mile radius), or within the region (5-mile radius) of the proposed decontamination and deconstruction project area,

laydown areas, and light use area. Parks and recreation facilities within 5 miles of the project area are noted in Table 3-8 and illustrated on Figure 3-2 (above).

Table 3-8. Parks and Recreation Facilities within 5 miles of Project Area

Park Name	Managing Agency
Bison Park	City of Memphis
Boxtown Park	City of Memphis
Chickasaw Park	City of Memphis
Chucalissa Archaeological Site	University of Memphis
Dalstrom Park	City of Memphis
Falcon Park	City of Memphis
Ford Park	City of Memphis
Kansas-Riverview Park, Community Center and Swimming Pool	City of Memphis
Martin L King Riverside Park and Marina	City of Memphis
O.L. Cash Park	City of Memphis
Otis Redding Park	City of Memphis
Redbud Park	City of Memphis
Roosevelt Park	City of Memphis
T.O. Fuller State Park	State of Tennessee
Walker Park	City of Memphis
Walter Chandler Park	City of Memphis
Weaver Park	City of Memphis
Western Park	City of Memphis
Westwood Park, Community Center and Swimming Pool	City of Memphis

Sources: City of Memphis, TN 2019 and TVA 2018

T.O. Fuller State Park, which contains the Chucalissa Archaeological Site, is located within 0.5 mile of the proposed light use area and is approximately 0.6 mile from the proposed decontamination and deconstruction project area. T.O. Fuller State Park consists of 1,138 acres of forest, including floodplains, wetlands and six miles of hiking trails. Recreation facilities at the park include a picnic area, campground, swimming pool, and tennis courts. The Chucalissa Archaeological Site is located within the boundaries of the state park, and includes a Native American village, preserved archaeological excavations, and a modern museum (Tennessee State Parks 2019).

There are 17 City of Memphis parks located within 5.0 miles from the proposed project area. These parks range in size from approximately 3 acres to over 150 acres, and provide varying amenities including playgrounds, swimming pools, walking trails, sports fields and courts, community centers, pavilions, and picnic areas (City of Memphis 2019).

In addition to developed recreation facilities, there are also opportunities for dispersed recreation in the region around ALF. Dispersed recreation occurs in an undeveloped setting and includes informal activities such as hiking, nature observation, primitive camping, backpacking, horseback riding, cycling, boating, canoeing, fishing, rock climbing, off-road all-terrain vehicle use, and driving for pleasure. McKellar Lake is located immediately north of ALF and is occasionally utilized for recreational boating and fishing. However, it is part of

the International Port of Memphis and is primarily characterized by industrial rather than recreational use.

Additionally, the Ensley Bottoms Complex is adjacent to the proposed decontamination and deconstruction project area and includes the ALF surface impoundments, McKellar Lake, Presidents Island Wildlife Management Area north of McKellar Lake, T. O. Fuller State Park, the T.E. Maxson Waste Water Treatment Plant, and other public and private lands in the vicinity of ALF. The Ensley Bottoms Complex is known to be utilized by recreational bird watchers, as shorebirds and waterfowl frequent this area (TWRA 2019c). Although the ALF facilities are not open to the public, TVA allows birders to view the East Ash Pond Complex from surrounding roadways.

3.17.2 Environmental Consequences

3.17.2.1 Alternative D1 – Full Demolition of Units 1, 2 and 3 and Related Structures Resulting in a Brownfield Site, Drop Removal of Stacks and Structures

There are no parks or developed recreation facilities within the proposed decontamination and deconstruction project area, laydown areas, or light use area, borrow material would be obtained from a previously permitted borrow site, and demolition debris would be disposed of at an existing permitted offsite landfill. Therefore, there would be no direct impact to parks or developed recreational areas under Alternative D1.

Deconstruction activities could cause some temporary shifts in recreational boating and fishing in the waters immediately adjacent to the plant, but any impacts should be negligible due to the short duration of demolition and limited recreational use of McKellar Lake. Deconstruction activities would also have a temporary impact on bird watchers who frequent the areas immediately adjacent to the plant. However, additional bird watching opportunities are present at multiple locations in the vicinity of ALF, including T.O. Fuller State Park, Presidents Island Wildlife Management Area, and the Earth Complex sewage ponds just southeast of the ACT plant. Therefore, Alternative D1 is anticipated to have a short term and minor impact on dispersed recreation.

Under Alternative D1, demolition debris and scrap metal would be hauled to an offsite landfill or recycling facility by truck, rail or barge. Removal and transport of this material would require the use of up to 15 truckloads (30 truck trips) per day for approximately 18 months. In addition, up to 180 truckloads (360 truck trips) per day would be needed to transport borrow material to ALF. Transport of borrow material would occur intermittently over a period of approximately 12 months. As the exact hauling routes for demolition debris and borrow material are not known, there is potential for indirect impacts to parks and recreation facilities that may be located along the haul routes used to transport of these materials during the demolition and restoration phases. Increased traffic, noise, and potential fugitive dust from the vehicle use (workforce, debris disposal, borrow) may have temporary effects on parks and recreation facilities adjacent to transportation routes. However, vehicles would utilize existing arterial and interstate roadways as much as possible, where the additional traffic would not have a significant impact on existing traffic volume or traffic noise. T.O. Fuller State Park is located approximately 0.6 mile to the east of the ALF and any routes used to haul construction debris offsite or borrow onsite may require the utilization of roadways adjacent to this park. In order to minimize impacts to users of the park, transportation of demolition debris and borrow material would not utilize the roadways within the park. Due to the short term nature of the transport of demolition debris offsite and temporary and intermittent nature of the transport of borrow material

onsite, indirect impacts to users of T.O. Fuller State Park and any other parks or recreation facilities adjacent to haul routes would be minor.

As described in Section 3.16.2.1, impacts to parks and recreation facilities are not anticipated if demolition debris and scrap metal are transported from ALF via rail or barge.

3.17.2.2 Alternative D2 – Full Demolition of Units 1, 2 and 3 and Related Structures Resulting in a Brownfield Site, Mechanical Removal of Stacks and Structures

Under Alternative D2, impacts to parks and recreation would be the same as those described above for Alternative D1 and would be short term and minor.

3.17.2.3 Alternative D3 – Full Demolition of Units 1, 2 and 3 and Related Structures Resulting in a Brownfield Site, Hybrid Removal of Stacks and Structures

Under Alternative D3, impacts to parks and recreation would be the same as those described above for Alternative D1 and would be short term and minor.

3.17.2.4 Alternative E – No Action

Under the No Action Alternative, TVA would not perform any decontamination, deconstruction or other disposition activities at ALF and the project area and vicinity would remain in its current condition. Therefore, there would be no impacts to parks or recreation.

3.18 Noise and Vibration

3.18.1 Affected Environment

3.18.1.1 Noise

Noise is unwanted or unwelcome sound usually caused by human activity and added to the natural acoustic setting of a locale. It is further defined as sound that disrupts normal activities or that diminishes the quality of the environment. Community response to noise is dependent on the intensity of the sound source, its duration, the proximity of noise-sensitive land uses, and the time of day the noise occurs (i.e., higher sensitivities would be expected during the quieter overnight periods).

Sound is measured in logarithmic units called decibels (dB). Given that the human ear cannot perceive all pitches or frequencies of sound, noise measurements are typically weighted to correspond to the limits of human hearing. This adjusted unit of measure is known as the A-weighted decibel (dBA) which filters out sound in frequencies above and below human hearing. A noise level change of 3 dBA or less is barely perceptible to average human hearing. However, a 5 dBA change in noise level is clearly noticeable. The noise level associated with a 10-dBA change is perceived as being twice as loud; whereas the noise level associated with a 20-dBA change is considered to be four times as loud and would therefore represent a “dramatic change” in loudness.

To account for sound fluctuations, environmental noise is commonly described in terms of the equivalent sound level. The equivalent sound level is the constant noise level that conveys the same noise energy as the actual varying instantaneous sounds over a given period. Fluctuating levels of continuous, background, and/or intermittent noise heard over a specific period are averaged as if they had been a steady sound. The day-night sound level (L_{dn}), expressed in dBA, is the 24-hour average noise level with a 10-dBA correction penalty for the hours between 10 p.m. and 7 a.m. to account for the increased sensitivity of people

to noises that occur at night. Typical background day-night noise levels for rural areas is anticipated to range between an L_{dn} of 35 and 50 dB, whereas higher-density residential and urban areas background noise levels range from 43 dB to 72 dB (EPA 1974).

There are no federal, state, or locally established quantitative noise-level regulations specifying environmental noise limits in Shelby County, Tennessee. However, the EPA noise guideline recommends outdoor noise levels do not exceed L_{dn} of 55 dBA, which is sufficient to protect the public from the effect of broadband environmental noise in typical outdoor and residential areas. These levels are not regulatory goals but are “intentionally conservative to protect the most sensitive portion of the American population” with “an additional margin of safety” (EPA 1974). The U.S. Department of Housing and Urban Development (HUD) considers an L_{dn} of 65 dBA or less to be compatible with residential areas (HUD 1985).

Should explosive demolition be used to remove the stacks and other structures, noise would be generated both from the explosion and from the collapse of the stack onto the ground. The fact that this noise generation from demolition would be a one-time event removes it from the continuous, background, and intermittent noise category that defines equivalent sound level, L_{dn} , and corresponding levels of sensitivity within the community. For example, a jet flyover at 1,000 feet has a high sound pressure level of approximately 105 dB (Arizona DOT 2008), but in most environments, is not a recurring event that would contribute to typical noise levels. Similarly, a single explosive blast event may be equivalent to a thunderclap (120 dB) at the source whereas ongoing noise generated by heavy equipment used during deconstruction activities would fall under the standard continuous, background, and intermittent noise category that determines L_{dn} and associated community sensitivity.

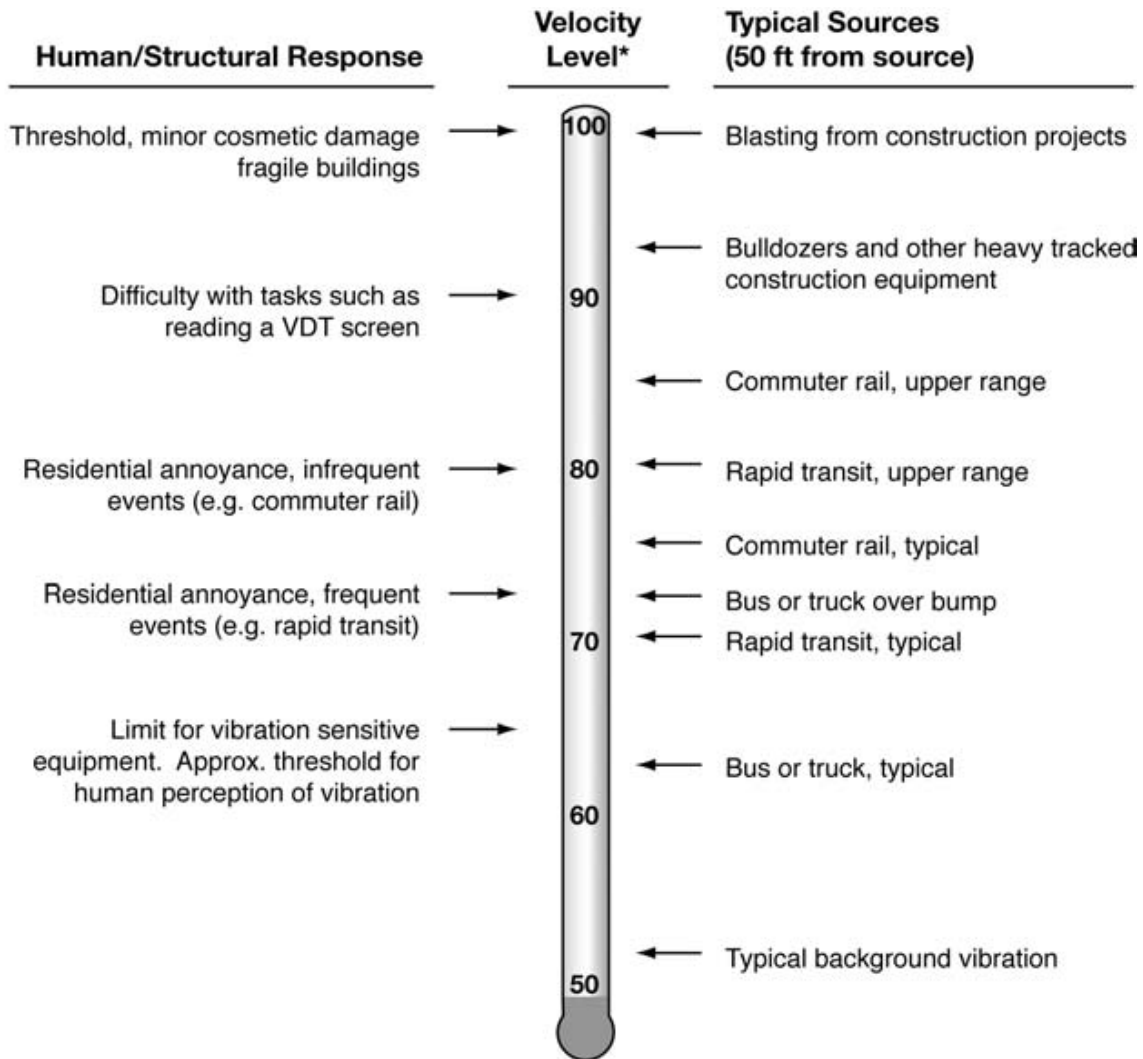
ALF is located south of McKellar Lake in an area used for industrial purposes. ALF’s three coal fired units and associated coal facilities were retired on March 31, 2018 and do not generate any significant noise. However, ambient noise in the area is characterized by operations at the ACT and ACC plants, the existing combustion turbine units, and other industrial operations. The closest residences are located approximately 1.5 miles southeast of the project area, and T.O. Fuller State Park is located approximately 0.6 miles southeast of the project area. T.O. Fuller State Park and the surrounding residential area are situated on lands at a higher elevation than ALF and densely forested areas of T.O. Fuller State Park separate residential areas from the project area.

3.18.1.2 Vibration

Construction and demolition activities, including the operation of heavy machinery, construction-related vehicles, and blasting, can create ground vibration. There are three primary types of receivers that can be adversely affected by ground vibration: people, structures, and equipment. Ground vibrations and ground noise can cause annoyance to people who live or work near sources of vibration. Additionally, if the vibration amplitudes are high enough, there is the possibility of physical and cosmetic damage to structures, and the possibility of interference with the functioning of sensitive machinery. The length of time and strength of vibration varies with the equipment used. For example, the vibration from blasting has a high amplitude and short duration, whereas vibration from grading or highway traffic is lower in amplitude but longer in duration (Caltrans 2013).

The Federal Transit Authority developed a noise and vibration impact assessment manual for estimating vibrations generated by common transportation and construction sources,

possible damage levels, and dampening distances. Figure 3-3 presents typical levels of ground-borne vibration at 50 feet for a variety of common transportation and construction equipment. At 50 feet from the source, community annoyance begins at a velocity level of 70 vibration decibels (VdB) for frequent events. Damage to structures occurs at 100 VdB for one-time activities such as blasting operations (FTA 2006). There are no residences or privately-owned structures located within 50 feet of any of the proposed actions at the ALF project area.



* RMS Vibration Velocity Level in VdB relative to 10^{-6} inches/second
Source: FTA 2006

Figure 3-3. Typical Levels of Ground-Borne Vibration

3.18.2 Environmental Consequences

3.18.2.1 Alternative D1 – Full Demolition of Units 1, 2 and 3 and Related Structures Resulting in a Brownfield Site, Drop Removal of Stacks and Structures

Under Alternative D1, decontamination activities would last approximately 12 to 18 months and deconstruction would last approximately 12 months and may overlap with the decontamination phase. This would be followed by a restoration period of approximately 12 months during which borrow material would be transported to the site. Work would occur during daytime hours, between 6:00 am and 6:00 pm, up to seven days a week. Noise impacts under this alternative would be associated with the site decontamination and deconstruction, drop removal of stacks 1-3, workforce vehicle traffic, transport of deconstruction debris offsite, and transport of borrow material to ALF.

During the decontamination and deconstruction phases, noise would be generated by a variety of construction equipment and vehicles including front-end loaders, dozers, excavators, graders and dump/haul trucks. Typical noise levels from this equipment is expected to be 85 dBA or less at a distance of 50 feet from the construction equipment (FHWA 2016). Based on straight line noise attenuation, it is estimated that noise levels from these sources would attenuate to 49.3 dBA at T.O. Fuller State Park, southeast of the proposed decontamination and deconstruction area, and 41.1 dBA at the nearest residence, also southeast of the decontamination and deconstruction area. These noise levels are below both the EPA L_{dn} guideline of 55 dBA and the HUD L_{dn} guideline of 65 dBA.

The noise associated with the explosive drop removal of the stacks and certain structures would be temporary, short-term events and would each be the equivalent of a thunderclap at the source. The noise associated with the collapse of the structures would follow closely behind and would be perceived as a single boom. Due to the distance (1.5 miles) to the nearest residence and the lack of sensitive receptors within 0.5 mile, this single noise occurrence would be considerably muted for members of the general public. In addition, notifications to the public, including area emergency services, would be issued prior to the use of explosives for demolition. With warning to the public prior to blasting activities, residents would be prepared for a single loud noise. Therefore, direct impacts to noise levels in the area associated with blasting would be minor and temporary.

There is a potential for indirect noise impacts associated with a temporary increase in traffic related to the workforce vehicle traffic, transport of deconstruction debris offsite, and transport of borrow material to ALF. TVA estimates that the workforce needed for decontamination would range in size from 40 to 150 personnel over a 12 to 18-month period. The deconstruction workforce of approximately 50 personnel would be needed for approximately 12 months which could overlap the decontamination work phase. Assuming one person per commuting vehicle, there would be a daily morning inbound traffic volume of up to 200 vehicles and a daily outbound traffic volume of up to 200 vehicles per day for up to 18 months. Workforce traffic noise would only occur twice per day as workers are entering and leaving the project site and would be dispersed among the surrounding roadways.

Under Alternative D1, during deconstruction and demolition activities, demolition debris and scrap metal would be hauled to an offsite permitted landfill or recycling facility by truck, rail or barge. Following deconstruction and demolition, borrow material would be transported to ALF when needed to support site restoration. The exact haul routes that would be used to

transport demolition debris and borrow material are not known. While haul routes would use arterial or interstate roadways whenever possible, it may be necessary for some routes to utilize local roads within the vicinity of ALF. Therefore, there is potential for indirect impacts to sensitive noise receptors along these routes. Routes that use interstate highways or major arterial roadways would not result in a noticeable increase in traffic volume and consequently, traffic noise in the vicinity of these major roadways. On the lower functioning roadways closest to ALF, increased traffic would be short term and dispersed among local roadways and therefore would have a minor impact on sensitive receptors in the vicinity of roadways.

Transport of demolition debris and scrap metal by rail or barge would not have a noticeable effect on sensitive noise receptors along the rail or waterway as transport of material via these modes of transportation are expected to be integrated into existing systems.

Vibrations from heavy machinery use and most deconstruction activities would be minor, and due to the distance to the nearest receptors (over 0.5 mile), would not cause structural or cosmetic damage or be perceptible to members of the community. Vibrations from explosive demolition events, however, could potentially affect nearby structures. If deemed necessary during development of the demolition plan, TVA would evaluate the potential for vibration impacts. TVA would use site-specific data provided by the blasting contractor to prepare a vibration model simulating the effects of discharge of the explosives or vibrations due to the stacks hitting the ground. The model results would be compared to thresholds developed by the U.S. Bureau of Mines for vibration damage (Siskind et al. 1980). The study would assess structures within a 0.5-mile radius of the stacks. The installation of imported fill, dirt binder and geofabric could also serve as a form of noise/vibration control.

Seismologic analyses carried out at recent demolitions of other tall industrial chimneys in the United States strongly suggest that the vibrations would not result in measurable effects on nearby structures (Protec 2013). These seismological analyses were conducted to measure the effects from demolition-related vibrations on standing structures in the vicinity of the chimney demolitions. In each case, vibrations were below the recommended limits set by the U.S. Bureau of Mines Report (Siskind et al. 1980). The report authors concluded the vibrations from the demolitions would not cause damage to structures as close as 526 feet from the blast area. Vibrations resulting from the demolition of ALF stacks and structures are anticipated to be of similar or lesser magnitude, as the 400-foot stacks at ALF are several hundred feet shorter than those discussed in the report. Therefore, no damage to surrounding structures is anticipated. In order to add further protection, TVA would require the demolition contractor to develop and implement a demolition plan in order to minimize vibration effects at ALF and in the vicinity. Due to the temporary nature of the operation, implementation of the demolition plan, the site's industrial location, and distance to nearest receptors (over 0.5 mile), noise and vibration effects on the environment are expected to be short term and minor.

3.18.2.2 Alternative D2 – Full Demolition of Units 1, 2 and 3 and Related Structures Resulting in a Brownfield Site, Mechanical Removal of Stacks and Structures

Under Alternative D2, noise and vibration impacts from all deconstruction and hauling activities, excluding noise and vibration impacts associated with removal of the stacks and structures, would be the same as under Alternative D1.

Under Alternative D2, levels of noise and vibration associated with removal of the stacks and structures by controlled mechanical methods would be significantly lower than drop

removal using explosives under Alternative D1. Overall, impacts to noise and vibration as a result of Alternative D2 would be short term and minor.

3.18.2.3 Alternative D3 – Full Demolition of Units 1, 2 and 3 and Related Structures Resulting in a Brownfield Site, Hybrid Removal of Stacks and Structures

Under Alternative D3, noise and vibration impacts from all deconstruction and hauling activities, excluding noise and vibration impacts associated with removal of the stacks and structures, would be the same as under Alternative D1.

Under Alternative D3, the stacks for Units 1 through 3 would be removed by a hybrid approach of dismantling the uppermost portions of the stacks and structures by mechanical methods and then using explosives to remove the remaining lower portions. This method of stack removal would result in levels of noise and vibration similar but slightly lower than Alternative D1, as the lower portions of the stacks and structures would require fewer explosives and have a shorter falling distance. Overall, impacts to noise and vibration as a result of Alternative D3 would be short term and minor.

3.18.2.4 Alternative E – No Action

Under the No Action Alternative, TVA would not perform any deconstruction or other disposition activities and the site would remain in its current condition. There would be no impacts to noise or vibration under this alternative.

3.19 Solid and Hazardous Waste

3.19.1 Affected Environment

In July through August of 2018, Wood performed a hazardous materials survey of the decontamination and deconstruction project area for TVA. The hazardous materials survey focused primarily on building materials that might have been constructed using asbestos, lead paint, PCB bulk products, and inorganic metals along with Resource Conservation and Recovery Act (RCRA) characteristic organic compounds. These materials may require abatement, proper disposal, or decontamination prior to demolition (Wood 2019).

The hazardous materials survey recorded quantities and locations of hazardous materials, focusing primarily upon areas of the plant scheduled for demolition. In addition to bulk sample collection and analysis, the hazardous materials survey used historical documentation to estimate hazardous materials quantities for inaccessible materials. Additional sampling of inaccessible materials, such as liquids or residual solids in sumps, tanks, or storage containers, may be required prior to demolition activities.

The following materials are known or expected to be present at ALF:

- ACM
- Mercury in equipment switches and gauges
- Lead-containing materials including paint, coatings, roof vents, circuit boards, batteries, and cathode ray tubes
- Polychlorinated Biphenyls (PCBs) in replacement bushings and light ballasts

- Materials such as glaze, caulk, building siding, roofing materials, electrical cable, cable trays, etc.
- Other construction waste (e.g., concrete, scrap metal, etc.)
- Universal waste (fluorescent light bulbs, batteries, etc.)
- Aboveground storage tanks
- Containerized petroleum products or chemicals
- Refrigerants and ozone depleting substances
- Tritium exit signs
- Radioactive sources from equipment
- Various oils and fuels
- Antifreeze
- Batteries in bulk and associated fixtures including deep cycle series uninterruptible power supply batteries and lead batteries from emergency lighting
- Street lighting
- Heavy metals
- Batteries
- Creosote (in railroad ties)
- Technologically Enhanced Naturally Occurring Radioactive Materials (TENORM)

ACM are located throughout the site. In addition to use as a thermal system insulator in the powerhouse, asbestos is present in a variety of materials throughout the site. Estimated ACM at ALF, including insulation, caulking, heat shielding, and plaster, is summarized in Table 3-9 (Wood 2019).

Table 3-9. Estimated ACM at ALF

Asbestos Containing Material	Estimated Areas	Unit
Asbestos Piping	At least 90,000 ¹	linear feet
Asbestos Tank Insulation	15,000	SF
Asbestos Heat Shielding	3,000	SF
Galbestos Siding ²	160,000	SF
Asbestos Roofing Material	10,000	SF
Floor Tile and Mastic	9,000	SF
Window Glazing and Caulk	900	linear feet
Lab Countertop	1,200	SF

Source: Wood 2019

SF = Square feet

¹ Based on inconsistent labeling and limited sample volume, accurate quantities for piping and duct insulation are not available.² Galbestos siding is corrugated steel coated with an asphalt-asbestos material providing protection against corrosion.

Sampling of lead-containing paint was not conducted for the hazardous materials survey. TVA has assumed all paint within the decontamination and deconstruction project area to be metal-containing paint. During the survey, other lead-containing articles such as lead-containing batteries, and lead cable areas were inventoried when accessible. Potential lead-containing electronic wastes included cathode ray tubes and printed circuit boards.

The hazardous materials survey noted 151 individual aboveground storage tanks with capacity greater or equal to 55 gallons at ALF. None of the aboveground storage tanks or containers were reported to have had any historical releases or were observed to show signs of releases during the site reconnaissance (Wood 2019). Universal waste and potentially regulated materials were also inventoried in the hazardous materials survey. An estimated summary of these materials is presented in Table 3-10. According to plant personnel no pesticides or herbicides were stored on the site during the time of the site reconnaissance; all pesticides used on the site were brought onsite from offsite storage and maintenance facilities. No underground storage tanks remain on the site.

Table 3-10. Estimated Quantity of Universal Waste and Potentially Regulated Items at ALF

Inventory	Estimated Quantity (each)
Fluorescent mercury-containing light tubes	3,300
High intensity discharge lamps	230
High pressure sodium lights	160
Fluorescent lamps	1,150
Compact Fluorescent lamps	8
Halogen lamps	60
Cooling systems containing refrigerant	132
Mercury switches and gauges	311
Emergency exit signs	44
Lead roof vents	12
Station battery cells	232
Source: Wood 2019	

PCB-containing equipment at the site was estimated in the hazardous materials survey. There were 1,300 light ballasts and three replacement bushings that potentially contain PCBs (Wood 2019). No PCBs were detected in tested bulk samples of caulking and coatings. According to TVA personnel, no transformers or capacitors containing PCBs remain at the facility (Wood 2019).

A naturally occurring radioactive material (NORM)/Technically Enhanced Naturally Occurring Radioactive Materials (TENORM) survey was performed by Wood over the period of July 9-13, 2018. The survey was a radiological screening survey to provide information of radiation levels for decommissioning planning, and no regulatory criteria exists for NORM detected on building materials for demolition. Gamma radiation measurements were compared to the local background gamma radiation levels as an indicator for potential presence of NORM/TENORM. The measurements were performed in areas of the plant that are most probable to have NORM/TENORM, such as boiler brick, bottom ash, ash sluice pipes, stack brick, and breach brick, among others. Background for ALF was estimated to be 9 microRem per Hour ($\mu\text{R/hr}$). One area in Building 2, three areas in Building 15, and one area in Building 19 were found to have elevated measurement readings collected during the survey (Wood 2019).

In addition to the radiation screening, a total of six samples were collected and analyzed for total RCRA metals. High levels of chromium were detected for paint samples collected from panels on the conveyors and from doors on the east side of the hydrogen buildings (Wood 2019).

3.19.2 Environmental Consequences

3.19.2.1 Alternative D1 – Full Demolition of Units 1, 2 and 3 and Related Structures Resulting in a Brownfield Site, Drop Removal of Stacks and Structures

Alternative D1 would involve removal of potential contaminant sources from the various structures, deconstruction of the structures identified in Chapter 2, and drop removal of stacks. TVA would remove hazardous materials to secure the facility prior to implementation of any action taken to demolish structures. While most painted steel

material would be recycled as scrap, loose and flaking paint chips that may contain high levels of PCBs or RCRA metals including lead must be managed as a separate waste stream, thus requiring Toxicity Characteristic Leaching Procedure metal analysis to determine proper disposal options. Hazardous materials that would be addressed prior to demolition include ACMs, lead-containing materials, aboveground storage tanks, TENORM, and other hazardous materials identified throughout the survey area. Specific oil stains or areas that may contain materials of concern would be addressed prior to demolition as well. Because samples taken during the 2018 Hazardous Materials Survey exceeded disposal criteria for TENORM or exhibited high levels of chromium, a more representative average as determined from additional samples, along with radiation screening and leachate analysis, may be needed to determine the best use and proper disposal of these limited materials from the decontamination and deconstruction project area.

Along with TVA BMPs, all materials determined to be waste would be evaluated (e.g. waste determinations) and managed (e.g. inspections, container requirements, permitted transport) in accordance with applicable federal and state rules including TDEC Solid and Hazardous Waste Rules and Regulations as described in TDEC Division of Solid Waste Management Rule 0400 Chapters 11 and 12, respectively. Prior to demolition activities, hazardous waste, PCB, ACM, lead paint, and universal waste would require special removal, handling, labeling and disposal by appropriately trained and licensed personnel and contractors. These materials would be disposed of at a facility designed and permitted to receive hazardous materials. Brick, block, and concrete demolition debris not contaminated by ACM or other hazardous materials could be used as clean fill in the basements and lower levels of the facility. Removed materials would be transported to a landfill or other approved disposal facility operated by a company under TVA contract. Thus, direct impacts would be minor due to the limited potential for hazardous waste to be discharged and/or released into the environment under this alternative.

In addition, demolition activities under Alternative D1 would create demolition debris and scrap metal that would be hauled to a permitted landfill or recycling facility. Although a specific landfill has not been identified, given that material would be disposed in a permitted landfill that has the capacity to receive waste materials, and the potential that scrap metal would be recycled, it is expected that disposal of demolition debris would have a negligible effect on the long-term ability to meet disposal needs of the region.

3.19.2.2 Alternative D2 – Full Demolition of Units 1, 2 and 3 and Related Structures Resulting in a Brownfield Site, Mechanical Removal of Stacks and Structures

Impacts under Alternative D2 would be to the same as those described under Alternative D1 and would be minor.

3.19.2.3 Alternative D3 – Full Demolition of Units 1, 2 and 3 and Related Structures Resulting in a Brownfield Site, Hybrid Removal of Stacks and Structures

Impacts under Alternative D3 would be to the same as those described under Alternative D1 and would be minor.

3.19.2.4 Alternative E – No Action

Under the No Action Alternative, the potential risk to contaminate soil and groundwater as systems and structures degrade would be higher than Alternatives D1, D2, and D3. Peeling lead-based paint, failing concrete, buckling floor tiles, and deteriorating asbestos and ACM are examples of the onsite hazard risk. There would also be issues with the long-term

functionality of sump pumps, which are maintained to remove water from floor drains. If these sump pumps are allowed to become inoperative, water would build up in the sumps, become stagnant, and leach potentially contaminated water into the groundwater.

Concerns regarding trespassing and vandalism would also be higher than with the other alternatives. The presumed presence of materials that could be salvageable might attract thieves. Unauthorized persons at the site could presumably be exposed to potential contaminants or physical injury. Although TVA personnel have removed all PCB transformers as well as deactivated, drained, and decommissioned the majority of aboveground storage reservoirs and disposed of mobile containers, drums, and totes as part of the plant closure process, materials present in the remaining structures (including lead-based paint, wiring, and plumbing) would remain. Over time, degradation of hazardous materials on the ALF site could result in potential releases to the environment (e.g., through leaching to soils, surface water, or groundwater), and would be likely to have moderate long-term impacts. Overall, impacts from hazardous and solid waste are anticipated to be moderate under Alternative E.

3.20 Socioeconomics and Environmental Justice

3.20.1 Affected Environment

ALF is located in the city of Memphis, southwest of the downtown area, in Shelby County, Tennessee. It is located on the southern shore of McKellar Lake within the Frank C. Pidgeon Industrial Park, which is characterized by heavy industrial use.

For the socioeconomic and environmental justice analysis, potentially affected communities were defined as any census block group that falls within a 10-mile radius of ALF, within the boundaries of Shelby County. Due to distance and separation by the Mississippi River, communities to the west of ALF in Crittenden County, Arkansas, will neither be directly impacted by decontamination and deconstruction activities nor indirectly impacted by associated transportation activities. Therefore, the study area is appropriately limited to Shelby County, as these populations are local to the project and have the potential for exposure to human health or environmental hazards related to noise, fugitive dust, traffic, and air emissions. Included as secondary geographic areas of reference are the City of Memphis, Shelby County, and the state of Tennessee. Comparisons at multiple spatial scales provide a more detailed picture of populations that may be affected by the proposed actions including any environmental justice populations (e.g., minority and low-income). Demographic and economic characteristics of populations within the study area were assessed using the 2013-2017 American Community Survey five-year estimates provided by the U.S. Census Bureau (USCB) (USCB 2019a).

3.20.1.1 Demographics

Memphis is a densely populated metropolitan area with a total population of 654,723. The population of Memphis accounts for approximately 70 percent of the total population for Shelby County and 10 percent for all of Tennessee (Table 3-11). Collectively, the block groups that make up the study area have a total population of 204,970. This population represents approximately 31 percent of the total population of Memphis and 22 percent of Shelby County. It should be noted that the block group that contains the project area, all laydown areas, the light use area, and the western portion of the anticipated haul route along Riverport Road is an industrial area with no residential population.

Table 3-11. Demographic Characteristics

	10-mile Radius (Shelby County)	City of Memphis	Shelby County	State of TN
Population^{1,2}				
Population, 2017 estimate	204,970	654,723	937,847	6,597,381
Population, 2010	209,722	646,889	927,644	6,346,105
Percent Change 2010-2017	-2.3%	1.2%	1.1%	4.0%
Persons under 18 years, 2017	21.8%	25.2%	25.3%	22.7%
Persons 65 years and over, 2017	13.6%	11.8%	12.2%	15.4%
Racial Characteristics¹				
Not Hispanic or Latino				
White alone, 2017 (a)	17.0%	26.1%	36.5%	74.3%
Black or African American, 2017 (a)	77.9%	63.7%	53.2%	16.7%
American Indian and Alaska Native, 2017 (a)	0.2%	0.1%	0.1%	0.2%
Asian, 2017 (a)	1.2%	1.6%	2.5%	1.7%
Native Hawaiian and Other Pacific Islander, 2017 (a)	0.0%	0.0%	0.0%	0.1%
Some Other Race alone, 2017 (a)	0.2%	0.2%	0.2%	0.1%
Two or More Races, 2017	1.0%	1.4%	1.5%	1.9%
Hispanic or Latino, 2017	2.5%	7.0%	6.1%	5.2%
Housing and Income¹				
Housing units, 2017	101,806	298,310	403,206	2,903,199
Median household income, 2013-2017	\$34,649	\$38,230	\$48,415	\$48,708
Persons below poverty level, 2013-2017	30.6%	26.9%	20.8%	16.7%
Persons below low-income threshold, 2013-2017 (b)	56.1%	51.0%	40.8%	37.3%

(a) Includes persons reporting only one race.

(b) Low-income threshold is defined as two times the poverty level

Sources: ¹USCB 2019a; ²USCB 2011

Minority populations represent the primary component of the population of the project area. Specifically, blacks or African Americans represent 77.9 percent of the population within the study area (Table 3-11), 63.7 percent of the population of Memphis, and 53.2 percent of the population of Shelby County. These percentages are notably greater than the state-wide value for Tennessee (16.7 percent). In contrast, whites account for 17.0 percent of the population within the study area, even though they represent 36.5 percent and 74.3 percent of Shelby County and Tennessee, respectively. Other minority racial and ethnic groups are present in the study area but are at or below comparative rates for Shelby County and Tennessee.

The average median household income of the block groups that comprise the study area is \$34,649. In comparison, the median household incomes for Memphis, Shelby County and Tennessee are \$38,230, \$48,415, and \$48,708, respectively (Table 3-11).

3.20.1.2 Economic Conditions

Shelby County contains a total employed labor force of 430,218 workers (Table 3-12). Business sectors providing the greatest employment include: Education, Health Care and Social Assistance (22.8 percent); Transportation, Warehousing and Utilities (12.0 percent); Retail Trade (11.4 percent); and Professional, Scientific, Management, and Administrative Services (10.3 percent).

Table 3-12. Largest Employers by Sector Within Shelby County, Tennessee

Sector	Number of Employees	Percent
Education, Health Care and Social Assistance	97,957	22.8%
Transportation, Warehousing and Utilities	51,826	12.0%
Retail Trade	48,879	11.4%
Professional, Scientific, Management, and Administrative Services	44,113	10.3%
Arts, Entertainment, Recreation, Accommodation and Food Services	40,288	9.4%
Manufacturing	38,817	9.0%
Finance, Insurance, Real Estate, Rental and Leasing	23,364	5.4%
Public Administration	20,446	4.8%
Construction	20,099	4.7%
Wholesale Trade	14,412	3.3%
Subtotal	400,201	93.0%
Total Employed Population	430,218	100%

Source: USCB 2019a

The total employed civilian population within the block groups that make up the study area is 82,589, with the unemployment rate at 13,406 people, or 14.0 percent of the civilian labor force. This unemployment rate is noted to be higher relative to the unemployment rates of the city of Memphis (10.4 percent), Shelby County (8.6 percent) and the State of Tennessee (6.6 percent) (Table 3-13).

Table 3-13. Employment Characteristics of the Resident Labor Force

Employment Status	Population			
	10-mile Radius (Shelby County)	City of Memphis	Shelby County	State of TN
Population >16 years	165,158	506,705	726,932	5,270,257
Civilian Labor Force	95,995	321,611	470,615	3,207,366
Employed	82,589	288,253	430,218	2,996,610
Unemployed	13,406	33,358	40,397	210,756
Unemployment				
% of Total Population > 16 years	8.1%	6.6%	5.6%	4.0%
% of Civilian Labor Force	14.0%	10.4%	8.6%	6.6%

Source: USCB 2019a

3.20.1.3 Environmental Justice

On February 11, 1994, President Clinton signed EO 12898 Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations. EO 12898 mandates some federal-executive agencies to consider environmental justice as part of the NEPA. Environmental justice has been defined as the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income (EPA 2018a) and ensures that minority and low-income populations do not bear disproportionately high and adverse human health or environmental effects from federal programs, policies, and activities. Although TVA is not one of the agencies subject to this order, TVA routinely considers environmental justice impacts as part of the project decision-making process.

Guidance for addressing environmental justice is provided by the Council on Environmental Quality's (CEQ) Environmental Justice Guidance under the National Environmental Policy Act (CEQ 1997). The CEQ defines minority as any race and ethnicity, as classified by the USCB, that is: Black or African American; American Indian or Alaska Native; Asian; Native Hawaiian and Other Pacific Islander; some other race (not mentioned above); two or more races; or a race whose ethnicity is Hispanic or Latino (CEQ 1997). Low-income populations are based on annual-statistical poverty thresholds also defined by the USCB.

Identification of minority populations requires analysis of individual race and ethnicity classifications as well as comparisons of all minority populations in the region. Minority populations exist if either of the following conditions is met:

- The minority population of the impacted area exceeds 50 percent of the total population
- The ratio of minority population is meaningfully greater (i.e., greater than or equal to 20 percent) than the minority population percentage in the general population or other appropriate unit of geographic analysis (CEQ 1997)

The nationwide poverty level is determined annually by the USCB and varies by the size of family and number of related children under 18 years of age. The 2018 USCB Poverty Thresholds state the poverty threshold as an annual household income of \$25,900 for a family of four. For an individual, an annual income of \$13,064 is the poverty threshold (USCB 2019b). For the purposes of this assessment, low-income individuals are those whose annual household income is less than two times the poverty level. This broader low-income threshold is an appropriate measure for environmental justice consideration because current poverty thresholds are often too low to adequately capture the populations adversely affected by low income levels, especially in high-cost areas. For example, the effects of income on baseline health and other aspects of susceptibility are not limited to those below the poverty thresholds; those from one to two times the poverty level also have worse health overall than those with higher incomes (Centers for Disease Control and Prevention 2011). A low-income population exists if either of the following two conditions is met:

- The low-income population exceeds 50 percent of the total number of households
- The ratio of low-income population significantly exceeds (i.e., greater than or equal to 20 percent) the appropriate geographic area of analysis

Based on a preliminary review of the EPA's EJSCREEN tool, the majority of communities in the vicinity of ALF meet the criteria for consideration as minority and/or low-income populations. A more detailed evaluation was completed using the 2013-2017 American Community Survey data to identify specific block groups within the study area that exceed environmental justice thresholds. Figure 3-4 identifies the block groups that meet the specified criteria as environmental justice minority populations or low-income populations.

Minority populations make up 83.0 percent of the total population within the study area. Comparatively, minorities comprise 73.9 percent of the population of the city of Memphis, 63.5 percent of Shelby County, and 25.7 percent of Tennessee (see Table 3-11). The minority communities identified in Figure 3-4 are primarily comprised of Black or African American populations, which frequently represented more than 75 percent of the total population within each block group.

As shown in Table 3-11, the percentage of the population living below the low-income threshold within the study area is 56.1 percent. This percentage is slightly greater than that of the city of Memphis (51.0 percent) and notably greater than that of Shelby County (40.8 percent) and the state of Tennessee (37.3 percent). Figure 3-4 identifies individual block groups determined to meet the criterion for consideration as low-income population groups subject to environmental justice considerations.

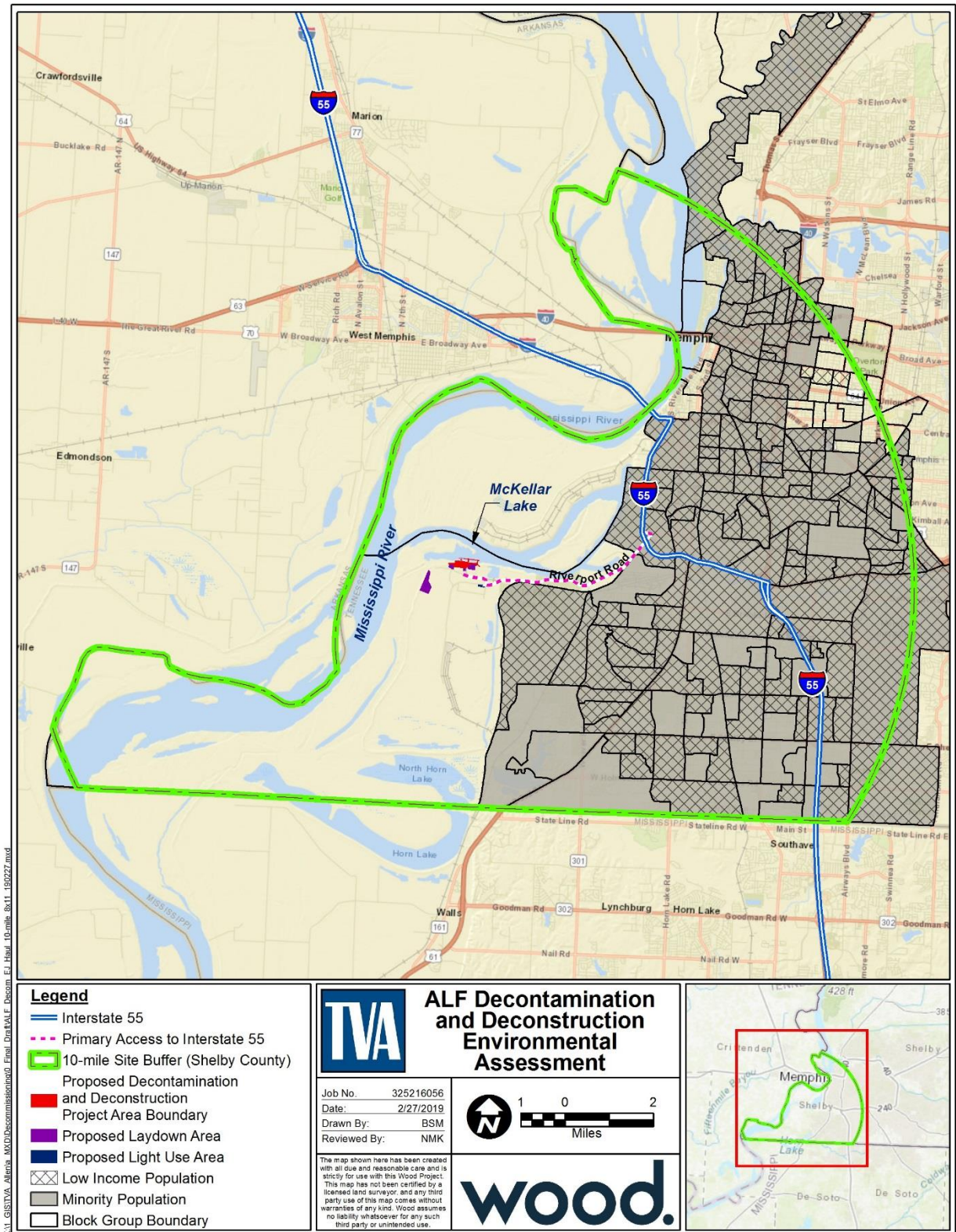


Figure 3-4. Environmental Justice Populations Within the Study Area

3.20.2 Environmental Consequences

3.20.2.1 Alternative D1 – Full Demolition of Units 1, 2 and 3 and Related Structures Resulting in a Brownfield Site, Drop Removal of Stacks and Structures

3.20.2.1.1 Socioeconomic Impacts

Demographic characteristics of the project area are expected to change temporarily in response to the in-migration of a transient construction workforce. Implementation of Alternative D1 would require a decontamination workforce ranging in size from 40 to 150 personnel over 12 to 18 months, as well as a separate deconstruction workforce of approximately 50 personnel for approximately 12 months, which could overlap with the decontamination phase of the project. Workers could be drawn from the labor force that currently resides in the study area. However, specialty workers and laborers not available within the area would be expected to temporarily relocate to the project area to support decontamination or deconstruction activities. However, given that most of the workers would be drawn from the existing labor force, the impact would be minor.

Construction activities would entail a temporary increase in employment and associated payrolls, the purchases of materials and supplies, and procurement of additional services. Revenue generated by income tax and sales tax from new workers would benefit the local economy. Additionally, beneficial secondary impacts would result from expenditure of the wages earned by the workforce involved in decontamination and deconstruction activities. For example, the hospitality and service industries would benefit from the demands brought by the influx of the construction workforce.

In addition, full demolition of the site would allow the deconstructed area to be redeveloped in the future for industrial or commercial use. While a specific future use has not been determined at this time, economic redevelopment of the site would be in line with the growth and improvements envisioned for the Frank C. Pidgeon Industrial Park, which would ultimately contribute to the region's economic health. Overall, socioeconomic impacts from Alternative D1 are anticipated to be positive, although minor relative to the total economy of the county.

3.20.2.1.2 Environmental Justice

As indicated in Figure 3-4, the majority of block groups that make up the study area meet the criteria for consideration as minority and/or low-income populations under Executive Order 12898. However, the project area, laydown area, and light use area are located in an area reserved for heavy industry, in a block group that has no residential population. Additionally, in the closest block group with a residential population, just east of ALF, T.O. Fuller State Park serves as a buffer between the residential neighborhoods and these industrial areas. The nearest residences are located approximately 1.5 miles to the southeast and, therefore, would not experience any direct impacts from onsite decontamination and deconstruction activities. Consequently, there would be no direct impacts to the surrounding communities or environmental justice populations as the result of decontamination and deconstruction activities.

Transportation activities associated with Alternative D1 include hauling demolition debris to an existing permitted landfill, hauling debris offsite to be recycled and obtaining borrow material from a previously permitted site for use in site restoration. Demolition debris may be transported along existing roadways in the vicinity of ALF for a period of approximately 18 months. In addition, the need for borrow material for site restoration would require the

transport of borrow from a previously developed or permitted borrow site within 30 miles of ALF. The borrow would be intermittently transported along existing roadways during the site restoration period of approximately 12 months.

These activities would temporarily result in increased traffic, transportation related noise, exposure to fugitive dust, and exhaust emissions for those communities located along the transportation routes. Although the exact locations of the landfill and borrow site are not known, it is assumed that transport of these materials would use existing arterial or interstate roadways whenever possible. Given the location of ALF, Riverport Road would have to be used to access the site and Interstate 55 would be the primary route used to reach Riverport Road, via an interchange at West Mallory Avenue. The segment of Riverport Road between ALF and Interstate 55 is bounded by industrial and commercial development and uninhabited areas like T.O. Fuller State Park. Project-related traffic is anticipated to fit in with familiar traffic patterns along this route and the residential communities located along the interstate and other arterial routes are generally set back at a distance from the roadway, minimizing impacts from noise and dust emissions.

While haul routes will use arterial or interstate roadways whenever possible, it may be necessary for some routes to utilize local roads through residential areas. For example, local workforce traffic and borrow material transport may utilize alternative routes through the environmental justice communities to the southeast of ALF to reach Riverport Road, as these areas are not accessible via higher-capacity, urban roadways. However, the transport of borrow and demolition debris is intermittent in nature and not expected to result in heavy volumes of traffic through residential areas for extended periods of time. Mitigation measures including implementing BMPs for controlling fugitive dust and proper maintenance of vehicles for controlling emissions would further reduce impacts to these communities.

Due to the short term and intermittent nature of the transport of demolition debris and borrow material, indirect impacts from transportation-related activities would be short term and minor and mitigated with the use of BMPs designed to minimize emissions of fugitive dust.

3.20.2.2 Alternative D2 – Full Demolition of Units 1, 2 and 3 and Related Structures Resulting in a Brownfield Site, Mechanical Removal of Stacks and Structures

Under Alternative D2, impacts to socioeconomics and environmental justice populations would be similar to those described above for Alternative D1.

3.20.2.3 Alternative D3 – Full Demolition of Units 1, 2 and 3 and Related Structures Resulting in a Brownfield Site, Hybrid Removal of Stacks and Structures

Under Alternative D3, impacts to socioeconomics and environmental justice populations would be similar to those described above for Alternative D1.

3.20.2.4 Alternative E – No Action

Under the No Action Alternative, ALF would be left in “as is” condition. Consequently, employment at the plant would remain at existing levels and would not substantially change the local demographics or economy. Additionally, environmental justice populations would not be disproportionately affected by the No Action Alternative.

3.21 Utilities and Service Systems

3.21.1 Affected Environment

Current utilities and service systems at ALF include drinking water, process wastewater and cooling water, sanitary wastewater, electrical, fiber optics, compressed air, and natural gas. The ACT Plant and the 161 kV switchyard, along with the 22-inch buried gas main and 12-inch potable water loop, both owned by MLGW, will remain at ALF under all alternatives.

3.21.2 Environmental Consequences

3.21.2.1 Alternative D1 – Full Demolition of Units 1, 2 and 3 and Related Structures Resulting in a Brownfield Site, Drop Removal of Stacks and Structures

Implementation of Alternative D1 would require that all aboveground utilities and service systems be removed. All buried utilities, with the exception of the 22-inch gas main and the 12-inch domestic water loop, would be cut and properly abandoned in place. Only safety-necessitated utilities, including lighting, security, and fire protection, would be active. Utilities constructed of hollow pipe would be decommissioned by placing a mechanical cap or plug and/or concrete in an open end. Sanitary sewer lines and lift stations would be cleaned as deemed necessary and closed in place. Utilities would be abandoned in place. Manholes and catch basins would be demolished to 3 feet below final grade. The firewater loop, including hydrants around the switchyard and oil barge unloader would be maintained during deconstruction and may require cutting/capping to maintain system integrity while isolating from the domestic loop where connected.

Overall, the impacts of Alternative D1 on utilities and service systems are expected to be minor. No impacts would be anticipated beyond the proposed decontamination and deconstruction area.

3.21.2.2 Alternative D2 – Full Demolition of Units 1, 2 and 3 and Related Structures Resulting in a Brownfield Site, Mechanical Removal of Stacks and Structures

Under Alternative D2, impacts to utilities and service systems would be the same as those described for Alternative D1 and would be minor and localized.

3.21.2.3 Alternative D3 – Full Demolition of Units 1, 2 and 3 and Related Structures Resulting in a Brownfield Site, Hybrid Removal of Stacks and Structures

Under Alternative D3, impacts to utilities and service systems would be the same as those described for Alternative D1 and would be minor and localized.

3.21.2.4 Alternative E – No Action

Under Alternative E, the facility would remain in place to degrade from its current condition. With the exception of active utilities described in Section 3.21.1, only utilities necessitated by safety, such as lighting, security, and fire protection, would be active on the ALF site.

If the facility remains in the “as-is” condition, it would likely present a higher risk than Alternatives D1, D2, and D3, as utilities would not be maintained and would degrade over time, resulting in the potential to contaminate soil and groundwater. Impacts related to Alternative E would occur over the long-term and are expected to be minor.

3.22 Public Health and Safety

3.22.1 Affected Environment

ALF is located on the southern shore of McKellar Lake, approximately 5 miles southwest of downtown Memphis, Tennessee. The plant is located in an area that supports industrial land use, with the closest residences located approximately 1.5 miles southeast of the project area and T.O. Fuller State Park located approximately 0.6 mile southeast of the project area.

There are two points of access to ALF from Interstate 55. One is a Single-Point Urban Interchange with a diamond configuration at West Mallory Avenue. From West Mallory Avenue, Riverport Road provides direct truck and automobile access to ALF. The other is a partial (half-diamond) interchange at Kansas Street. The access at Kansas Street is to/from the west only. From Kansas Street, Rivergate Drive provides access between Kansas Street and Riverport Road. ALF is surrounded by chain link security fence, with the entrance gates guarded.

3.22.2 Environmental Consequences

TVA would maintain security at the facility under all alternatives, but at a greater level with Alternative E than Alternatives D1 through D3, as these alternatives would have fewer facilities and structures to monitor. TVA would also periodically assess the condition of remaining site facilities as they deteriorate.

3.22.2.1 Alternative D1 – Full Demolition of Units 1, 2 and 3 and Related Structures Resulting in a Brownfield Site, Drop Removal of Stacks and Structures

Under Alternative D1, all hazardous materials associated with buildings and structures would be removed and disposed of, and ALF and additional structures and facilities shown in Figure 2-2 would be demolished. Structures would be demolished to grade or at least 3 feet below grade, which would result in the current property becoming a brownfield. Contamination of soil and groundwater would be unlikely. This action would result in the lowest risk to soil and groundwater, as contaminants would be removed from the site. Decontamination activities would last approximately 12 to 18 months and deconstruction would last approximately 12 months and may overlap with the decontamination phase. This would be followed by a restoration period of approximately 12 months during which borrow material would be transported to the site. As part of the structure removal, the stacks and certain structures would be demolished via explosives. Safety precautions would be employed to prevent the general public from accessing explosives and detonators, minimizing increases in public risk due to the use of explosives. Minor increases in risk to worker safety would occur under this alternative due to the use of explosives. However, these risks would be minimized through implementation of safety measures such as those described below.

Prior to demolition of the stacks and structures, the area would be prepared, and a circular fall exclusion zone equal to 1.5 times the height of the chimney would be established. During the blast event, no personnel would be allowed in the fall exclusion zone. A targeted fall zone would be established. A fall exclusion zone area would also provide a sufficient safety buffer for debris and dust control around the area as well as a control zone for any unlikely change in the intended fall direction. All worker activity would comply with federal and state safety regulations, including donning appropriate personal protective equipment,

maintaining equipment in good working order, and adequate training for work performed, which minimizes safety risks.

Explosives would be managed under the direction of a licensed blaster. Security would be a very important component of this event to eliminate any threats to public health or safety as much as possible. Once explosives arrive onsite, 24-hour security would be provided to monitor the explosives. Detailed security plans would be developed and provided to area emergency response agencies. Security details, including any information about the transport and storage of explosives, would be limited to authorized personnel only. Site security on the day of the event would be strictly enforced, and trespassing would not be tolerated. Notifications to the public would be issued prior to the use of explosives for demolition.

Public health and safety concerns related to hazardous materials would be low under this alternative. The potential for contaminants from the facility to reach soil and groundwater would be almost nonexistent. Potential contaminants removed prior to structure deconstruction would be hauled to an offsite landfill. Brick, block, and concrete demolition debris not contaminated by asbestos or other hazardous materials would be used as clean fill onsite. Other demolition debris would be hauled by truck to an offsite landfill within 30 miles of ALF or to an offsite recycling facility. The materials would be transported along existing roadways in the vicinity of ALF for a period of approximately 18 months. In addition, site restoration would require the transport of borrow material from a previously developed or permitted borrow site within 30 miles of ALF for a period of approximately 12 months. These hauling activities would cause an increase in truck traffic to and from the facility intermittently during the construction and restoration periods.

Increased traffic could lead to a slightly higher risk of traffic accidents in the ALF vicinity during decontamination, demolition and restoration phases of the project due to the increase in the number of vehicle miles traveled on surrounding roadways. This increase in vehicle miles is a factor in injury and fatal traffic crash rates. Therefore, there would be a temporary minor impact related to increased traffic and driver safety. Trespassing and vandalism would not be a notable issue under this alternative because there would be little to attract unauthorized persons.

Transport of demolition debris and scrap metal by rail or barge would be along existing rail lines and waterways and would be integrated within the existing rail freight system and waterways. As such potential effects public health and safety are not anticipated.

Deconstruction activities within McKellar Lake, including removal of mooring cells and barge facilities, could pose risks to construction workers in the water, recreational river traffic in the area, and river traffic accessing the Port of Memphis. However, any impacts should be negligible due to the short duration of demolition and limited recreational use of McKellar Lake. It is TVA policy that all contractors have in place a site-specific health and safety plan prior to conducting construction activities at TVA properties. With the high level of safety awareness and preparation during demolition and removal of facilities, safety and security plans and safety awareness would reduce potentially large safety risk (felling of stacks and demolition of buildings and water structures) down to a minor and temporary impact.

Use of BMPs, safety procedures, and security measures along with ongoing environmental maintenance activities would minimize possible safety effects. Therefore, impacts to public health and safety under Alternative D1 are expected to be minor and short term.

3.22.2.2 Alternative D2 – Full Demolition of Units 1, 2 and 3 and Related Structures Resulting in a Brownfield Site, Mechanical Removal of Stacks and Structures

The activities for this alternative are the same as for Alternative D1 with the exception that the stacks and structures would be dismantled through mechanical means rather than by demolition using controlled explosives. Impacts to human health and safety for this alternative would be the same as for Alternative D1 except for not having the explosives-related safety and security issues. With the preparation and execution of safety plans and training, overall impacts to safety would be minor and short term.

3.22.2.3 Alternative D3 – Full Demolition of Units 1, 2 and 3 and Related Structures Resulting in a Brownfield Site, Hybrid Removal of Stacks and Structures

The activities for this alternative are the same as for Alternative D1, with the exception that the stacks and structures would be dismantled through use of controlled explosive demolition and dismantlement. This method of stack removal involves the need for increased security measures during a blast event as described for Alternative D1 as well as risks of accidents during dismantlement as described for Alternative D2. However, the risks of Alternative D3, as compared to Alternative D2, would be lower since the dismantlement would be used for only the upper part of the stacks. Additionally, the risks of Alternative D3 as compared to Alternative D1 would be lower as controlled explosive demolition would be limited to only the lower part of the stacks and structures. With the preparation and execution of safety plans and training, overall impacts to safety would be minor and short term.

3.22.2.4 Alternative E – No Action

Under the No Action Alternative, TVA would not perform any deconstruction or other disposition activities at the ALF. If the facility remains in “as-is” condition, it likely would present a higher potential safety risk than Alternatives D1, D2 and D3 to contaminate soil and groundwater as systems and structures degrade. In addition, the risk of trespassing and injury to trespassers would likely increase due to a perception that salvageable materials are present on the site as well as the increased level of environmental contaminants. TVA would maintain security at a higher level at the facility due to remaining structures. Fencing and security personnel would remain, and TVA would also periodically assess the condition of remaining site facilities as they deteriorate. Due to the site location and distance to the nearest residences (approximately 1.5 miles), effects on safety to the general public would be minor.

3.23 Cumulative Impacts

The CEQ regulations (40 CFR 1500-1508) implementing the procedural provisions of the NEPA of 1969, as amended (42 USC 4321 et seq.) define cumulative impact as:

“...the impact on the environment which results from the incremental impact of the action when added to other past, present and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions” (40 CFR § 1508.7).”

TVA evaluated a full range of environmental resource issues for inclusion in the cumulative effects analysis. The proposed actions and their connected actions identified under Alternatives D1, D2 and D3 would occur mostly on land that was previously disturbed and is used for industrial purposes. The surrounding landscape is already subject to environmental stressors associated with continuing industrial operations. Consequently, as has been described in prior subsections of this EA, the existing quality of environmental resources with the potential to be directly or indirectly affected by project activities is generally low. The proposed transportation of demolition debris from the facility to an offsite landfill or recycling operation would utilize existing roadways and this material would be managed on land developed as a landfill or operated as an industrial facility. Additionally, borrow would be obtained from a previously permitted site. As such, impacts associated with these actions are confined to those associated with the transportation of materials from ALF for disposal or the transport of borrow to ALF to be used for site restoration.

3.23.1 Geographic Area of Analysis

The appropriate geographic area over which past, present, and future actions could reasonably contribute to cumulative effects is variable and dependent on the resource evaluated. The cumulative impact analysis is based on the resources of potential concern and the geographic area in which potential adverse effects from site-specific activities have the potential to alter (degrade) the quality of the regional environmental resources. For air quality, the geographic area is the county. Based upon the defined list of resources potentially affected by cumulative effects, the following geographic areas were considered appropriate for consideration in this analysis.

1. *Lands within Shelby County in the Vicinity of ALF and the ACC facility.* This geographic area provides an appropriate framework for the consideration of potential cumulative effects to terrestrial vegetation. This geographic area includes the 10-mile radius within Shelby County and encompasses lands on the ACC site, ALF decontamination and deconstruction project area and near off site areas proposed for use as laydown during construction.
2. *Lands and associated resources within 2 miles surrounding ALF.* This geographic area contains water resources (surface water and groundwater) and aquatic resources potentially impacted by runoff from operations of the ACC and ACT and decontamination and deconstruction activities at ALF.
3. *Regional Landfills.* This geographic area encompasses regional landfills that may accept solid and/or hazardous wastes associated with potential future actions. This geographic area extends for a distance of 30 miles (reasonable trucking distance) and includes established permitted landfills such as North Shelby Landfill, South Shelby Landfill and Tunica Landfill. For analysis of rail or barge transport to landfills, this geographic area extends for a distance of 600 miles as both of these modes of transport support shipping over longer distances.
4. *Surrounding Environmental Justice Communities.* This geographic area encompasses identified low income and minority populations near ALF that may be subject to effects from multiple actions. Such actions may include the transport of borrow material through environmental justice communities from candidate sites within a distance of approximately 10 miles from ALF.

3.23.2 Identification of “Other Actions”

3.23.2.1 Past Actions Undertaken by TVA

3.23.2.1.1 Construction of the ACC Plant

TVA constructed and is operating the ACC Plant fueled by natural gas, located just south of the existing coal facility on a site that TVA currently leases. The ACC facility became operational in April 2018 and is comprised of three individual combustion turbine units, two of which operate on natural gas with a generating capacity of 330 MW each. The remaining unit is a combustion steam turbine with a capacity to produce 420 MWs. Construction of this facility also included construction of a new gas pipeline lateral connecting the plant to an existing gas interstate pipeline that has adequate transportation capacity to supply the plant. The new gas pipeline lateral was constructed and is operated by MLGW.

3.23.2.1.2 Retirement of ALF

The three ALF coal units were retired in March 2018. Virtually all coal unit operational measures were discontinued, and the coal plant is currently subject to basic care and maintenance measures. Primary operational measures that were discontinued include daily coal barge operations, coal pile management, pumping and use of water from McKellar Lake for condenser cooling, and thermal discharges to the Mississippi River. The plant has discontinued the discharge of fly ash and bottom ash to designated wet impoundment areas. Routine plant deliveries have also been discontinued. The existing switchyard is being maintained for use in operations associated with the ACC facility. Employment at the plant has been reduced.

3.23.2.2 Other Actions

Past, present, and reasonably foreseeable future actions that were identified for consideration in this cumulative analysis are listed in Table 3-14. These actions were identified within the geographic area of analysis as having, in the aggregate, the potential to result in larger and potentially significant adverse impacts to the resources of concern.

Table 3-14. Summary of Other Reasonably Foreseeable Future Actions in the Vicinity of the Proposed Project

Actions Description	Description	Timing and Reasonable Foreseeability
Continuing Operations of the ACT and Adjacent Industrial Facilities	Operations at the ACT, Harsco Metals and Minerals, industries within Frank C. Pidgeon Industrial Park, Port of Memphis, ACC Plant, and operation of the T.E. Maxson Wastewater Treatment Facility	Past, Present, Reasonably Foreseeable Future
Groundwater Remediation at ALF	Remedial investigation into the nature and extent of groundwater contamination at ALF.	Past, Present, Reasonably Foreseeable Future
Upgrade to the T.E. Maxson Wastewater Treatment Plant	Ongoing expansion of the T.E. Maxson Wastewater Treatment Facility	Present
Development of the Port of Memphis and the Frank C. Pidgeon Industrial Park	Rail upgrades to Presidents Island and expansion of the southern end of Paul R. Lowry Road at Pidgeon Industrial Park	Reasonably Foreseeable Future
Future Redevelopment of the ALF Site	Industrial development of the ALF Site	Reasonably Foreseeable Future
CCR Management Projects at ALF	TVA plans to close the following surface impoundments at ALF: East Ash Pond Complex, West Ash Pond, and the Metal Cleaning Pond	Reasonably Foreseeable Future

Actions that have a timing that is “past” or “present” inherently have environmental impacts that are integrated into the base condition for each of the resources analyzed in this chapter. However, these actions are included in this discussion to provide for a more complete description of their characteristics. Actions that are not reasonably foreseeable are those that are based on mere speculation or conjecture, or those that have only been discussed on a conceptual basis.

3.23.2.3 Continuing Operations at ALF and at Adjacent Industrial Facilities

The ACT plant and the Harsco Metals and Minerals plant, both adjacent to the proposed decontamination and deconstruction project area, would continue operations at ALF. The ACT has 20 combustion turbine units that are designed to start quickly and typically are operated only during peak demand periods. The turbines run on diesel oil and natural gas to supply power during times of peak power demand across the TVA power system. Harsco Metals and Minerals is a provider of recycling solutions for industrial byproducts.

ALF is located within the Frank C. Pidgeon Industrial Park. This area is a zoned industrial park bounded on the north by McKellar Lake, on the west by the Mississippi River, on the east by the Canadian National Railroad, and the Mississippi State line on the south. The industrial park contains a number of developed uses including the existing ALF plant, the Maxson WWTP, the recently constructed ACC Plant, Nucor Steel, Electrolux, the City of Memphis Earth Complex, the CN/CSX intermodal facility, the ACT plant at ALF, and other zoned industrial sites (Moon Inc. 2008).

The City of Memphis owns and operates the T.E. Maxson WWTP, located on lands immediately west of ALF. The WWTP currently treats an average of 70 MGD of wastewater, serving the City since its commissioning in 1975. Treated wastewater is discharged into the Mississippi River while the primary and waste activated sludge is sent to a covered lagoon system for anaerobic digestion. The City is currently developing upgrades to final treatment processes to facilitate effective long-term operation of a disinfection system, address plant odor concerns, and provide additional treatment capacity (T.E. Maxson WWTF Process Upgrade Project 2019). Construction of these upgrades is expected to be completed by late summer 2019.

The commercial Port of Memphis is located across McKellar Lake immediately north of ALF. Past and present port operations impose a variety of continuing stressors on the ecosystem of McKellar Lake and the adjoining Mississippi River ecosystem associated with barge movement and activities. These stressors typically include physical forces (i.e., shear, pressure), wave induced shoreline erosion, drawdowns, entrainment mortality of planktonic life forms, and sediment re-suspension (TVA 2016).

3.23.2.4 Groundwater Remediation at ALF

TVA is currently engaged in a Remedial Investigation for the ALF East Ash Pond Complex under the direction of TDEC.

During TVA's routine groundwater monitoring around the East Ash Disposal Area in 2017, arsenic, lead, and fluoride (constituents of concern) were detected in groundwater at elevated concentrations above EPA maximum contaminant levels. Elevated pH values in groundwater were also observed. In May 2017, TVA voluntarily initiated an investigation to evaluate groundwater conditions on the north and south sides of the East Ash Disposal Area where contaminants of concern had been detected. TVA subsequently received a letter in July 2017 from TDEC initiating a remedial investigation. A Remedial Investigation Report was prepared by TVA to present the results of an investigation conducted in 2017-2018.

3.23.2.5 Infrastructure Improvements at the Port of Memphis and the Frank C. Pidgeon Industrial Park

The Port of Memphis was recently awarded a Competitive Rail Connectivity Grant to expand rail service on Presidents Island at the 58-acre public terminal facility. The project would include the construction of approximately 4,900 feet of new rail track in the terminal, plus four new switches. This would create capacity for approximately 70 additional 100-ton rail cars at the facility. The project would help companies that transfer bulk products from rail to barge. The public terminal is an inter-modal facility that provides access to waterborne, rail, truck, and pipeline operations, and provides general cargo handling services to more than 150 industries on Presidents Island and serves more than 300 metropolitan markets that can be reached overnight by truck (EDGE 2019).

In addition, the City of Memphis is in the process of designing a 6,800-foot expansion of the southern end of Paul R. Lowry Road at Pidgeon Industrial Park. The expansion of the road would create a southern access point to the proposed CN Riverport Logistics Center on 730 acres of property immediately east of the Intermodal Gateway Memphis facility in the Frank Pidgeon Industrial Area. The CN and CSX railroads are in the final planning phases of an expansion of the Intermodal Gateway Memphis facility south of ALF in the Frank C. Pidgeon Industrial Park. The expansion would double the size of the current facility and

more than triple the current annual intermodal container throughput (International Port of Memphis 2019b).

3.23.2.6 Future Redevelopment of the ALF Site

A new master plan for the Port of Memphis has been completed which identifies short, middle and long-range goals for future development on Presidents Island and within the Frank C. Pidgeon Industrial Park. Ninety-five percent of the industrial land on Presidents Island is occupied and supports approximately 200 companies with 4,000 employees, while the Frank C. Pidgeon Industrial Park supports 2,300 acres of under-developed industrial land, including the ALF site. The plan identifies constraints and opportunities for growth and offers recommendations for facility expansions and property redevelopment that include the ALF site. In addition, the plan identifies potential target industries for both Presidents Island and the Frank C. Pidgeon Industrial Park (International Port of Memphis 2018; International Port of Memphis 2019c).

While the plan is conceptual, and no particular development has been presented, TVA has had numerous discussions with the City of Memphis and MLGW as to their interest in potential economic redevelopment of the ALF property. The proposed action will make the ALF closure area land available for future economic development projects in the greater Memphis area. Redevelopment is of particular interest at this site due to its location within the Frank C. Pidgeon Industrial Park as well as its access to the Port of Memphis via McKellar Lake. Therefore, it is reasonably foreseeable that this site would be developed for another use that conforms to the current surrounding land uses and zoning.

3.23.2.7 CCR Management Projects at ALF

As part of TVA's goal to eliminate wet ash storage at its coal plants, TVA is considering closure of the ash impoundments and the metal cleaning pond at ALF. TVA is considering several options of closure of these facilities including Closure-by-Removal with CCR transported to an offsite landfill and Closure-by-Removal with CCR transported to a beneficial reuse processing facility. Although a decision regarding specific actions associated with these activities has not been finalized, the closure of existing surface impoundments and long-term management and storage of CCR generated at ALF are reasonably foreseeable activities. On November 30, 2018, TVA published a Notice of Intent in the Federal Register to prepare an Environmental Impact Statement (EIS) to address the potential environmental effects associated with several projects to facilitate long-term management of CCR stored at ALF. The EIS will identify the environmental impacts of activities associated with the proposed projects and would include a detailed cumulative effects assessment as part of the evaluation of alternatives.

3.23.3 Analysis of Cumulative Effects

To address cumulative impacts, the existing affected environment surrounding the proposed decontamination and deconstruction project area was considered in conjunction with the environmental impacts presented in Chapter 3. These combined impacts are defined by the Council on Environmental Quality as "cumulative" in 40 Code of Federal Regulations 1508.7 and may include individually minor but collectively significant actions taking place over a period of time. The potential for cumulative effects to each of the identified environmental resources of concern are analyzed below.

This analysis is limited only to those resource issues potentially adversely affected by preferred alternative project activities or connected actions. Accordingly, climate change,

geology, soils, vegetation, wildlife, threatened and endangered species, floodplains, wetlands, cultural and historic resources, managed and natural areas, parks and recreation, socioeconomics, utilities and service systems, and public health and safety and hazardous materials are not included in this analysis as these resources are either not adversely affected, or the effects are considered to be minimal or beneficial.

Primary adverse cumulative effects of the proposed actions as described in the preceding sections of Chapter 3 are related to the potential additive and overlapping effects on air quality, groundwater, surface waters, aquatic ecology, land use, noise, solid and hazardous waste, environmental justice, and transportation.

3.23.3.1 Air Quality

Air quality within the Memphis region is influenced by emissions from permitted industrial and commercial facilities and routine emissions from mobile sources. As such, the Memphis air quality region (Shelby County) was selected as the geographic reference areas for this resource.

It is expected that emissions would continue from on-going operations in the area, including emissions from local vehicles, TVA's ACT and ACC, Harsco Metals and Minerals, and other adjacent industrial facilities, including the Frank C. Pidgeon Industrial Park and the International Port of Memphis. By comparison, the recent shutdown of ALF has resulted in significant reductions in air emissions that represents a benefit to regional air quality conditions. In addition to ongoing emissions from vehicles and industrial operations, local emissions and fugitive dust are expected to occur in conjunction with activities associated with the closure of ash impoundments at ALF.

Air emissions associated with demolition activities under the proposed action would also result in an increase in local emissions and fugitive dust. As described in Section 3.1 emissions from equipment and vehicle use is expected to be minor and short term. In addition, fugitive dust emissions associated with demolition activities would be mitigated through the use of BMPs, such as water suppression for dust control and regular inspections and maintenance of construction vehicles. The cumulative effect of the demolition activity emissions, when combined with the ongoing emissions from local vehicles and adjacent industrial facilities, would incrementally increase emissions local to ALF under the proposed action, but such increases would not be notable on a regional scale. If the reasonably foreseeable future actions occur at the same time as the proposed project, there would be potential for minor and short-term impacts to air quality. However, exceedances of applicable ambient air quality standards are not expected. Consequently, exceedances of applicable air quality standards are not expected. Therefore, the cumulative effects of the proposed action on air quality would not adversely affect regional air quality.

3.23.3.2 Groundwater

As described in Section 3.3, groundwater quality within the vicinity of ALF is generally of good quality with selected areas of localized exceedances of MCLs. Activities associated with the reasonably foreseeable future actions listed in Table 3-14 also have the potential to affect groundwater. However, for many of these potential actions, implementation of the proper BMPs would minimize the impacts to groundwater. Additionally, in conjunction with the ongoing remedial investigation at the ALF East Ash Pond Complex coupled with the

commitment to implement appropriate corrective measures as required by TDEC and under the CCR Rule, groundwater characteristics are expected to improve.

Construction activities associated with decontamination and deconstruction at ALF have the potential to release constituents that may impact groundwater. However, demolition and environmental abatement would be conducted in accordance with any applicable environmental and safety regulations, minimizing the potential for a release of contaminants. In the long-term, all potential environmental contamination sources would be removed from the decontamination and deconstruction area, which would limit the potential for contamination of groundwater from these sources and would have a positive impact on groundwater quality relative to the No Action Alternative. Therefore, the cumulative effects of the proposed action on groundwater would not adversely affect groundwater.

3.23.3.3 Surface Water and Aquatic Ecology

The potential for cumulative effects to surface waters and water quality are largely driven by the variety of uses of and inputs into McKellar Lake. As described in Section 3.16, McKellar Lake is occasionally utilized for recreational boating and fishing. However, it is primarily characterized by industrial rather than recreational use, and there are a number of industrial facilities that discharge into the reservoir, contributing to the existing surface water quality.

Surface water under Alternatives D1, D2, and D3 could be potentially impacted due to runoff during soil disturbing activities. Similar impacts could be anticipated from the nearby construction projects and industrial and port expansions listed in Table 3-14. BMPs would be used for all construction activities to minimize and reduce indirect impacts on receiving streams and discharges into surface waters would comply with all NPDES permit limits and local, state, and federal regulations. Any construction activities in McKellar Lake would adhere to NPDES permit limit requirements and would utilize mitigation to minimize impacts to aquatic life. Therefore, given the local abundance of similar aquatic resources within the region, the relatively low quality of the resources potentially affected, and the implementation of BMPs during construction for all identified projects, cumulative impacts to aquatic and surface water resources from the proposed action at a watershed level are not anticipated.

3.23.3.4 Land Use

Under the proposed action, the decontamination and deconstruction project area would become available for potential redevelopment, allowing for future industrial or other economically beneficial use. Lands within the project area would remain as zoned industrial lands. While the extent of the potential future development is unknown, redevelopment of the site is foreseeable, and any future development would comply with uses allowed under the current zoning designation. Therefore, the cumulative effects of the proposed action on land use would not adversely affect local land use and zoning.

3.23.3.5 Transportation

Among the other identified actions within the geographic area, on-going industrial operations contribute to traffic volumes on surrounding roadways. On-going operations of these facilities and the traffic they generate are considered part of the existing environmental setting and are not expected to increase in the foreseeable future.

The reasonably foreseeable future projects such as the proposed CCR impoundment closures would contribute to additional traffic volumes on the local transportation network.

Such volumes may be substantial under the proposed closure-by-removal. The number of trucks associated with the transport of debris from ALF deconstruction, added to the number of trucks required to remove CCR from impoundments at ALF and the associated transport of borrow to support closure and restoration activities could result in a very large number of trucks entering and exiting the facility on a daily basis. This could lead to cumulative impacts associated with congestion along adjacent arterial roadways and possibly on Interstate 55. TVA would mitigate congestion in the vicinity of ALF with a traffic plan, as needed. Possibilities include staging of trucks, spacing logistics, or timing truck traffic to occur during lighter traffic hours (such as not in the morning or afternoon commute hours). With implementation of these mitigation measures, cumulative impacts of the proposed action to transportation would be moderate.

Future development at the Frank C. Pidgeon Industrial Park would add additional traffic volume to surrounding roadway. However, it is anticipated that the traffic volumes generated by future industrial development would be similar to current operations and would not impact LOS of the surrounding roadways. Therefore, there would be no cumulative impact to transportation associated with future development of the ALF site.

3.23.3.6 Noise and Vibration

The other identified actions within the geographic area, including on-going industrial operations are considered part of the existing environmental setting and are not expected to increase in the foreseeable future.

Implementation of the foreseeable future projects has the potential to contribute to additional noise impacts associated with construction activities. Due to the temporary nature of construction activities and distance to the nearest sensitive noise receptors, noise from construction associated with these activities are expected to be localized and would not result in a cumulative impact to noise. Therefore, the cumulative effects of the proposed action on noise emissions would not adversely affect sensitive noise receptors.

3.23.3.7 Hazardous Materials and Solid and Hazardous Waste

Under the proposed action, demolition debris and hazardous wastes would be hauled by truck to a landfill designed to receive such wastes. Due to the temporary nature of the operations and the use of permitted disposal facilities, along with trained and experienced contractors and personnel, environmental impacts from waste handling and disposal are not anticipated. Reasonably foreseeable future construction activities in the immediate vicinity, including CCR impoundment closures, would also have the potential to contribute waste to permitted disposal facilities in the region. Because there are permitted landfills in the vicinity of ALF that have sufficient capacity for large volumes of solid waste, and because large volumes of materials are expected to be recycled, the cumulative impact from the proposed project on local or regional landfill capacity is anticipated to be negligible.

3.23.3.8 Environmental Justice

Most of the communities within the vicinity of ALF meet the criteria for environmental justice consideration. Given the distance of these communities from ALF, there is a potential that these communities would be indirectly impacted due to an increase in traffic, noise, exposure to fugitive dust, and exhaust emissions from the trucks used to transport the borrow material and demolition debris. It is also likely that some of these communities would be along the routes taken during construction activities for the closure of CCR impoundments at ALF, or other planned construction projects within the vicinity of ALF.

Because these short term actions are potentially coincident, potential cumulative effects may be expected to occur on a local basis. Therefore, the cumulative effects of the proposed action on noise and dust emissions within low income and minority communities has the potential to represent a moderate increase in impact to environmental justice populations, if these activities occur concurrently with other construction activities in the geographic area. Such physical impacts associated with the transport of borrow material or demolition debris (i.e., noise, dust) would be mitigated through BMPs identified in Section 2.3.2 or by the selection of borrow sites that are not within identified environmental justice communities. These impacts would also be temporary occurring during the construction periods of these projects.

3.24 Unavoidable Adverse Impacts

Unavoidable adverse impacts are the effects of the proposed action on natural and human resources that would remain after mitigation measures or BMPs have been applied. Mitigation measures and BMPs are typically implemented to reduce a potential impact to a level that would be below the threshold of significance as defined by the CEQ and the courts. Impacts associated with the proposed activities have the potential to cause unavoidable adverse effects to natural and human environmental resources.

Unavoidable localized increases in air and noise emissions would occur during deconstruction activities. Activities associated with the use of construction equipment may result in varying amounts of dust, air emissions, noise, and vibration that may potentially impact onsite workers. Workers would use appropriate protection and adhere to safety standards designed to minimize worker-related injuries. Additional impacts include traffic noise, air emissions, and fugitive dust associated with the construction workforce traveling to and from the site, as well as the transport of demolition debris offsite and borrow material onsite. Emissions and fugitive dust from construction equipment and vehicles are minimized through implementation of mitigation measures, including proper maintenance of construction equipment and vehicles and dust suppression measures.

In addition, temporary impacts to water quality from runoff at the site could impact nearby receiving water bodies during construction activities. BMPs to minimize runoff would be implemented, and water discharged in the course of decontamination and deconstruction activities would meet established TDEC permit limits.

With the application of appropriate BMPs and adherence to permit requirements, these unavoidable adverse effects would be minor.

3.25 Relationship of Short-Term Uses and Long-Term Productivity

NEPA requires a discussion of the relationship between short term uses of the environment and the maintenance and enhancement of long-term productivity. This EA focuses on the analyses of environmental impacts associated with the decontamination and deconstruction of the buildings and structures at ALF that are no longer used for their original purpose to support power generation. For the purposes of this section, these activities are considered short term uses of the environment and the long-term is considered to be initiated upon the completion of deconstruction and site restoration.

Most environmental impacts during deconstruction activities would be relatively short term and would be addressed by BMPs and mitigation measures. Construction activities would have a limited, yet favorable short term impact to the local economy through the creation of construction jobs and associated revenue.

In the long term, the site could become very productive if redeveloped for industrial or commercial use, thereby producing employment opportunities and tax revenue and enhancing long-term productivity of the site.

3.26 Irreversible and Irretrievable Commitments of Resources

A resource commitment is considered irreversible when impacts from its use would limit future use options and the change cannot be reversed, reclaimed, or repaired. Irreversible commitments generally occur to nonrenewable resources such as minerals or cultural resources and to those resources that are renewable only over long time-spans, such as soil productivity. A resource commitment is considered irretrievable when the use or consumption of the resource is neither renewable nor recoverable for use by future generations until reclamation is successfully applied. Irretrievable commitments generally apply to the loss of production, harvest, or other natural resources and are not necessarily irreversible.

Resources required by decontamination and deconstruction activities, including labor and fossil fuels, would be irretrievably lost. Nonrenewable fossil fuels would be irretrievably lost through the use of gasoline and diesel-powered equipment during construction. However, it is unlikely that their limited use in these projects would adversely affect the overall future availability of these resources.

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CHAPTER 4 – LIST OF PREPARERS

4.1 NEPA Project Management

Name:	Carol Freeman, PG (TVA)
Education:	M.S., Geological Sciences and B.S., Geology
Project Role:	TVA NEPA Specialist
Experience:	10 years managing and performing NEPA compliance.
Name:	W. Douglas White (TVA)
Education:	B.S., Forestry
Project Role:	TVA NEPA Specialist
Experience:	15 year of experience in water resource management and NEPA compliance.
Name:	Karen Boulware
Education:	M.S., Resource Planning and B.S., Geology
Project Role:	Wood Project Manager. Geology and Soils, Groundwater, Public Health and Safety
Experience	25 years of professional experience in NEPA.

4.2 Other Contributors

TENNESSEE VALLEY AUTHORITY

Name:	Steve Cole
Education:	PhD, Anthropology; MA, Anthropology; and BA, Anthropology
Project Role:	Cultural Resources
Experience:	31 years in Archaeology and Cultural Resources Management
Name:	A. Chevales Williams
Education:	B.S. Environmental Chemical Engineering
Project Role:	Surface Waters
Experience:	14 years of experience in water quality monitoring and compliance; 13 years in NEPA planning and environmental services.
Name:	Carrie Williamson, P.E., CFM
Education:	B.S. and M.S., Civil Engineering
Project Role:	Floodplains
Experience:	6 years Floodplains, 3 years River Forecasting, 1 year NEPA Specialist, 7 years compliance monitoring.

Wood

Name: **Connie Heitz**
Education: M.P.A. Environmental and Natural Resource Management,
B.S. Public Affairs
Project Role: NEPA Lead, Technical Review, Utilities and Service Systems,
Transportation
Experience: 26 years in environmental and land use planning

Name: **Bill Elzinga**
Education: M.S. and B.S., Biology
Project Role: Project Reviews
Experience: 34 years of experience managing and performing NEPA
analyses for electric utility industry, and state/federal
agencies; ESA compliance; CWA evaluations.

Name: **Joel Budnik**
Education: M.S. and B.S., Wildlife and Fisheries Sciences
Project Role: Threatened and Endangered Species and Wildlife Review
Experience: 19 years of experience in environmental planning, NEPA
analysis and documentation, ecological studies, and
preparation of technical documents.

Name: **Rebecca Porath**
Education: M.S. and B.S., Wildlife and Fisheries Sciences
Project Role: Threatened and Endangered Species, Wildlife, Aquatic
Ecology, Vegetation, Visual Resources, Hazardous Materials
and Solid and Hazardous Waste, Cumulative Effects
Experience: 21 years of experience in environmental planning, NEPA
analysis and documentation, ecological studies, and
preparation of technical documents

Name: **Natalie Kleikamp**
Education: B.A., Biology
Project Role: Land Use, Prime Farmland, Managed and Natural Areas,
Parks and Recreation, Socioeconomics and Environmental
Justice, Noise and Vibration, Air Quality and Climate Change
Experience: 5 years of experience in NEPA analysis and documentation

Name: **Matt Basler**
Education: M.S., Fisheries Science and B.S., Wildlife and
Fisheries/Biology
Project Role: Aquatic Ecology Review
Experience: 13 years of experience in aquatic ecology

Name: **Stephanie Miller**
Education: M.S., Biology and B.S., Marine Biology
Project Role: Wetlands
Experience: 8 years of experience in aquatic and terrestrial ecology

Name:	Chris Mausert-Mooney
Education:	B.S., Biology (M.S. in progress)
Project Role:	Vegetation Review
Experience:	9 years of experience in ecological and botanical investigations

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CHAPTER 5 – ENVIRONMENTAL ASSESSMENT RECIPIENTS

5.1 Federal Agencies

U.S. Army Corps of Engineers
U.S. Environmental Protection Agency
U.S. Fish and Wildlife Service

5.2 Federally Recognized Tribes

Absentee Shawnee Tribe of Oklahoma
Cherokee Nation
The Chickasaw Nation
Eastern Band of Cherokee Indians
Eastern Shawnee Tribe of Oklahoma
Kialegee Tribal Town
Muscogee (Creek) Nation
Shawnee Tribe
Thlopthlocco Tribal Town
United Keetoowah Band of Cherokee Indians in Oklahoma

5.3 State Agencies

Tennessee Department of Agriculture
Tennessee Department of Economic and Community Development
Tennessee Department of Transportation
Tennessee Department of Environment and Conservation
Tennessee State Historic Preservation Officer
Tennessee Wildlife Resources Agency

5.4 Individuals and Organizations

Memphis Light, Gas and Water
Economic Development Growth Engine for Memphis and Shelby County
La Prensa Latina
Memphis Area Association of Governments
Port of Memphis
Protect our Aquifer
Tri State Defender

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Appendix A – Public and Agency Comments and TVA's Response

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Appendix A – Public and Agency Comments Received on the Draft EA and TVA's Response to Comments

A draft of the EA was released for public review and comment on May 31, 2019. The availability of the Draft EA and request for comments was announced in newspapers that serve the Shelby County area, and the Draft EA was posted on TVA's website. TVA's agency involvement included notification of the availability of the Draft EA to local, state, and federal agencies and federally recognized tribes. Comments were accepted through July 1, 2019, via TVA's website, mail, and e-mail.

TVA received two comment letters from members of the public via TVA's website. Additional comments received on the draft EA were from the Memphis and Shelby County Port Commission (Port Commission), the Tennessee Department of Environment and Conservation (TDEC), and the U.S. Environmental Protection Agency (EPA). TVA carefully reviewed all of the comments. Responses to comments raised during the comment period are provided below. A copy of each of the comments is included at the end of this section.

- 1. Comment:** On review of the decontamination draft EA, option D2 seems most preferable and lowest impact in the long run. Yes, it is expected to take longer but it seems the final impact is lower than the possible adverse effects of large blasts, vibration, etc. (*Commenter: Emily Graves*)

Response: Comment noted. As indicated in Section 2.4 of the EA, TVA's preferred alternative is full demolition to grade resulting in a brownfield site (Alternatives D1, D2, or D3). The final method for demolition of the stacks and structures would be determined by the construction contractor during development of the deconstruction plan. It should be noted that while Alternative D2 would result in marginally lower impacts from noise, vibration, and fugitive dust emissions when compared to D1 and D3, adverse impacts from all sub alternatives would be minor.

- 2. Comment:** I think the plant should be demolished as soon as possible, to speed implementation of more sustainable use of the property. (*Commenter: Jeff Lehr*)

Response: Thank you for your comment. As indicated in the EA, TVA's preferred alternative is full demolition of the plant resulting in a brownfield site. Full demolition of the plant would support the future development of the site.

- 3. Comment:** The Port Commission concurs with the TVA preferred alternative as stated on page 25 of the draft EA. The Port Commission strongly encourages a slightly modified full demolition of the facility to grade resulting in a usable brownfield site with the stacks removed. The Port Commission encourages TVA to not demolish building 24 – the Yard Equipment Maintenance Building/Coal Yard Maintenance Building or disconnect the utilities. The building would be a key location for a field office during future site development. (*Commenter: Randy Richardson - Port Commission*)

Response: As indicated in Section 2.4 of the EA, TVA's preferred alternative is full demolition to grade resulting in a brownfield site (Alternatives D1, D2, or D3). Utilities to the Maintenance Building (Building 24), including electricity, natural gas, potable water, and sewer, feed through a complex path of pipes, regulators, transformers, and duct banks located within the demolition footprint. As it would not be possible to demolish the main powerhouse while leaving the existing utilities to Building 24, utilities would have to be rerouted to this building, requiring significant effort. As the final disposition of the

site is currently unknown, TVA considers it unwise to leave the building in place and reroute the utilities to this location, potentially affecting future use of the site. However, if a final disposition of the site is determined before the building is demolished, TVA could negotiate a contract change to leave utility connections in place.

4. **Comment:** The demolition and development ready restoration of the site will have a major economic impact for the Port of Memphis, City of Memphis, Shelby County and the region. The TVA site is within the 8-mile long McKellar Lake harbor, a.k.a. the Port of Memphis. The Port of Memphis consists of over 150 industrial locations on 1,200 acres. The Port of Memphis is the 5th largest inland port in the United States. The Port of Memphis has an annual economic impact of \$9.2 billion dollars, creates 22,000 jobs in the region and annually transports 14 million tons of waterborne freight. The industrial facilities at the Port of Memphis are currently 100% occupied. The brownfield redevelopment of the 502-acre Allen Fossil Plant will provide much needed water fronted heavily industrial acreage in the Port of Memphis. (*Commenter: Randy Richardson - Port Commission*)

Response: Comment noted. TVA agrees that making the land available for future economic development is an important consideration, as indicated by its inclusion in the project Purpose and Need (Section 1.2 of the EA). The preferred alternative (Alternatives D1, D2, or D3) would meet the purpose and need of the project and will enhance the future economic development of the area.

5. **Comment:** TDEC believes the Draft EA adequately addresses potential impacts to cultural and natural resources within the proposed project area. (*Commenter: TDEC*)

Response: Comment noted.

6. **Comment:** TDEC recommends that coordination between the local air agency and the various on-site contractors involved in demolition activities be conducted so that any potential air monitoring sites in the area likely to be impacted by episodic fugitive dust are either temporarily suspended from operation or have their data potentially evaluated for exceptional event flagging. This would be of particular interest during any proposed explosives assisted demolition. TDEC recommends the Final EA reflect this consideration. (*Commenter: TDEC*)

Response: The following has been added to the list of mitigation measures identified in Section 2.3, TVA will notify Shelby County prior to any demolition activities. In addition, as noted in Section 2.3, if deconstruction activities have the potential to emit pollutants greater than acceptable thresholds in ALF’s existing Title V permit, mitigation may include a request to modify the permit, which would be required for the prevention of significant deterioration of air quality. In addition, TVA would work to minimize one-time emissions of fugitive dust from facilities expected to produce large volumes (such as demolition of the stacks) by working with the demolition contractor on a site-specific plan. The demolition contractor would be required to remove ash from the facilities proposed for deconstruction and demolition, prior to removal of that facility and implement dust control measures during demolition to prevent the spread of dust, dirt, and debris.

7. **Comment:** TDEC also recommends that careful consideration be given to establishment of onsite haul truck wash stations to be used to help mitigate track out

from the site of adhering soils contaminated by onsite materials destined to be disposed of. This would likely help reduce fugitive dust impacts on local haul roads leaving the site and also help to prevent any possible confusion between demolition related fugitive dust and those associated with CCR removal and disposals offsite if the two processes are allowed to occur simultaneously. (*Commenter: TDEC*)

Response: Applicable construction entrance and exits will be identified in the site specific SWPPP (Stormwater Pollution Prevention Plan). Appropriate BMPs in The Tennessee Erosion and Sediment Control Handbook and outlined in the project-specific SWPPP would be implemented to control offsite tracking of soils and dust management.

8. **Comment:** Currently TVA is evaluating the Closure-by-Removal of all CCR material at ALF, including the West Ash Pond, as detailed in the Allen Fossil Plant Ash Impoundment Closure EIS Scoping Report (March 2019). TDEC acknowledges that the current preferred alternative for CCR material management at ALF is Closure-by-Removal and beneficial reuse and/or disposal at an offsite landfill, and that the future approach to closing ALF ash impoundments might have implications on decontamination and deconstruction, specifically as outlined in Sections 2.1. In Section 2.1, TVA lists the buried Condenser Cooling Water (CCW) tunnel that runs through/beneath the West Ash Pond as “determine the status...at a later date”. Given TVA’s proposed plan to excavate and beneficially reuse and/or dispose of CCR material from the West Ash Pond, TVA will need to address the CCW tunnel removal/closure in the forthcoming Allen Fossil Plant Ash Impoundment Closure EIS. (*Commenter: TDEC*)

Response: As a component of decommissioning activities, the cooling water intake and discharge tunnels will be abandoned in place and bulk headed when levels in the Mississippi River are low enough to allow such activities. The EA has been revised to remove this action from the list of items to be considered at a later date.

9. **Comment:** TDEC concurs with TVA that an Aquatic Resource Alteration Permit (ARAP) permit may be necessary based on the project locations and impacts. TDEC also concurs with TVA that a Construction Stormwater Permit will be necessary for the project and the existing SWPPP for Allen will have to be amended as the process of decontamination and deconstruction progresses. The site is also within Memphis’s Municipal Separate Storm Sewer System (MS4) program area. (*Commenter: TDEC*)

Response: Concur. TVA will obtain all necessary permits, licenses and required approvals before project activities begin.

10. **Comment:** The EPA concurs with TVA’s preferred Alternative D and it’s options within Alternative D. Under these alternative options; D1, D2, or D3, the EPA further understands that TVA would fully demolish various buildings to grade. This includes the decontamination of all buildings, sumps and structures associated with plant operations and removal of hazardous materials. Additionally, the powerhouse and all associated structures would be demolished to 3-feet below final grade, along with removal of the three 400-foot tall stacks. This alternative would meet the purpose and need of the project and will enhance the future economic development of the area. (*Commenter: EPA*)

Response: Comment noted.

11. **Comment:** Please continue to keep the community informed throughout the project, and upon completion of your Final Environmental Assessment, please forward 1 hard copy to the NEPA Section (*Commenter: EPA*)
12. **Response:** Comment noted. TVA will provide the EPA a hard copy of the Final EA as requested.

Appendix B – Bat Strategy Project Assessment

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From: [Hamrick, Elizabeth Burton](#)
To: robbie_sykes@fws.gov; ross_shaw@fws.gov
Subject: Notification in accordance with TVA Programmatic Consultation for Routine Actions and Federally listed bats
Date: Wednesday, March 13, 2019 2:22:47 PM
Attachments: [ALF-D4_PowerPlants_TVA-Bat-Strategy_2019-03-13.pdf](#)

Good afternoon,

TVA's programmatic ESA consultation on routine actions and bats was completed in April, 2018. For projects with NLAA or LAA determinations, TVA is providing project-specific notification to relevant Ecological Service Field Offices. This notification also will be stored in the project administrative record. For projects that utilize Take issued through the Biological Opinion, that Take will be tracked and reported in TVA's annual report to the USFWS by March of the following year.

The attached form is serving at TVA's mechanism to determine if project-specific activities are within the scope of TVA's bat programmatic consultation and if there is project-specific potential for impact to covered bat species, necessitating conservation measures, which are identified for the project on pages 5-6. The form also is serving as the primary means of notification to the USFWS and others as needed.

***Project:** Allen Fossil Plant Decontamination and Deconstruction EA – Shelby County, TN, Mississippi River – TVA is proposing to decontamination and demolish buildings at the Allen Fossil Plant including smoke stack demolition. No trees would be removed. No jurisdictional wetlands would be impacted. No caves would be impacted. Buildings would be surveyed for presence/evidence of bat use prior to demolition.*

No use of Take would be necessary for the completion of this project.

Thank you.

Project Review Form - TVA Bat Strategy (12/2018)

This form should **only** be completed if project includes activities in Tables 2 or 3 (STEP 2 below). This form is not required if project activities are limited to Table 1 (STEP 2) or otherwise determined to have no effect on federally listed bats. If so, include the following statement in your environmental compliance document (e.g., add as a comment in the project CEC): "Project activities limited to Bat Strategy Table 1 or otherwise determined to have no effect on federally listed bats. Bat Strategy Project Review Form NOT required." This form is to assist in determining required conservation measures per TVA's ESA Section 7 programmatic consultation for routine actions and federally listed bats.¹

Project Name: Allen Fossil Plant (ALF) Decontamination and Deconstruction Environ Assessment **Date:** 2/29/2019
Contact(s): Carol Freeman, Env; Doug White, Env **CEC#:** **Project ID:**
Project Location (City, County, State): Allen Fossil Plant, Memphis, Shelby County, Tennessee
Project Description:

TVA is investigating the future disposition of buildings and structures at ALF that are no longer used for their original purpose of power generation. TVA is investigating options including securing and maintaining the plant, decontaminating and deconstructing (removing existing buildings and structures) the plant, or leaving the plant as is and taking no actions. No trees would be removed.

SECTION 1: PROJECT INFORMATION - ACTION AND ACTIVITIES

STEP 1) Select TVA Action. If none are applicable, contact environmental staff or Terrestrial Zoologist to discuss whether form (i.e., application of Bat Programmatic Consultation) is appropriate for project:

- | | |
|---|--|
| ☐ 1 Manage Biological Resources for Biodiversity and Public Use on TVA Reservoir Lands | ☐ 6 Maintain Existing Electric Transmission Assets |
| ☐ 2 Protect Cultural Resources on TVA-Retained Land | ☐ 7 Convey Property associated with Electric Transmission |
| ☐ 3 Manage Land Use and Disposal of TVA-Retained Land | ☐ 8 Expand or Construct New Electric Transmission Assets |
| ☐ 4 Manage Permitting under Section 26a of the TVA Act | ☐ 9 Promote Economic Development |
| ☒ 5 Operate, Maintain, Retire, Expand, Construct Power Plants | ☐ 10 Promote Mid-Scale Solar Generation |

STEP 2) Select all activities from Tables 1, 2, and 3 below that are included in the proposed project.

TABLE 1. Activities with no effect to bats. Conservation measures & completion of bat strategy project review form NOT required.

☐ 1. Loans and/or grant awards	☐ 8. Sale of TVA property	☐ 19. Site-specific enhancements in streams and reservoirs for aquatic animals
☐ 2. Purchase of property	☐ 9. Lease of TVA property	☐ 20. Nesting platforms
☐ 3. Purchase of equipment for industrial facilities	☐ 10. Deed modification associated with TVA rights or TVA property	☐ 41. Minor water-based structures (this does not include boat docks, boat slips or piers)
☐ 4. Environmental education	☐ 11. Abandonment of TVA retained rights	☐ 42. Internal renovation or internal expansion of an existing facility
☐ 5. Transfer of ROW easement and/or ROW equipment	☐ 12. Sufferance agreement	☐ 43. Replacement or removal of TL poles
☐ 6. Property and/or equipment transfer	☒ 13. Engineering or environmental planning or studies	☐ 44. Conductor and overhead ground wire installation and replacement
☐ 7. Easement on TVA property	☐ 14. Harbor limits	☐ 49. Non-navigable houseboats

TABLE 2. Activities not likely to adversely affect bats with implementation of conservation measures. Conservation measures and completion of bat strategy project review form REQUIRED; review of bat records in proximity to project NOT required.

☒ 18. Erosion control, minor	☐ 57. Water intake - non-industrial	☐ 79. Swimming pools/associated equipment
☐ 24. Tree planting	☐ 58. Wastewater outfalls	☐ 81. Water intakes – industrial
☐ 30. Dredging and excavation; recessed harbor areas	☐ 59. Marine fueling facilities	☐ 84. On-site/off-site public utility relocation or construction or extension
☐ 39. Berm development	☐ 60. Commercial water-use facilities (e.g., marinas)	☐ 85. Playground equipment - land-based
☐ 40. Closed loop heat exchangers (heat pumps)	☐ 61. Septic fields	☐ 87. Aboveground storage tanks
☐ 45. Stream monitoring equipment - placement and use	☐ 66. Private, residential docks, piers, boathouses	☐ 88. Underground storage tanks
☐ 46. Floating boat slips within approved harbor limits	☐ 67. Siting of temporary office trailers	☐ 90. Pond closure
☒ 48. Laydown areas	☐ 68. Financing for speculative building construction	☐ 93. Standard License
☐ 50. Minor land based structures	☐ 72. Ferry landings/service operations	☐ 94. Special Use License
☐ 51. Signage installation	☐ 74. Recreational vehicle campsites	☐ 95. Recreation License
☐ 53. Mooring buoys or posts	☐ 75. Utility lines/light poles	☐ 96. Land Use Permit
☐ 56. Culverts	☐ 76. Concrete sidewalks	

Table 3: Activities that may adversely affect federally listed bats. Conservation measures AND completion of bat strategy project review form REQUIRED; review of bat records in proximity of project REQUIRED by OSAR/Heritage eMap reviewer or Terrestrial Zoologist.

☐ 15. Windshield and ground surveys for archaeological resources	☐ 34. Mechanical vegetation removal, includes trees or tree branches > 3 inches in diameter	☐ 69. Renovation of existing structures
☐ 16. Drilling	☐ 35. Stabilization (major erosion control)	☐ 70. Lock maintenance/ construction
☐ 17. Mechanical vegetation removal, does not include trees or branches > 3" in diameter (in Table 3 due to potential for woody burn piles)	☒ 36. Grading	☐ 71. Concrete dam modification
☐ 21. Herbicide use	☐ 37. Installation of soil improvements	☐ 73. Boat launching ramps
☐ 22. Grubbing	☐ 38. Drain installations for ponds	☐ 77. Construction or expansion of land-based buildings
☐ 23. Prescribed burns	☐ 47. Conduit installation	☐ 78. Wastewater treatment plants
☐ 25. Maintenance, improvement or construction of pedestrian or vehicular access corridors	☐ 52. Floating buildings	☐ 80. Barge fleeting areas
☐ 26. Maintenance/construction of access control measures	☐ 54. Maintenance of water control structures (dewatering units, spillways, levees)	☐ 82. Construction of dam/weirs/ levees
☐ 27. Restoration of sites following human use and abuse	☐ 55. Solar panels	☐ 83. Submarine pipeline, directional boring operations
☐ 28. Removal of debris (e.g., dump sites, hazardous material, unauthorized structures)	☒ 62. Blasting	☐ 86. Landfill construction
☒ 29. Acquisition and use of fill/borrow material	☐ 63. Foundation installation for transmission support	☒ 89. Structure demolition
☐ 31. Stream/wetland crossings	☐ 64. Installation of steel structure, overhead bus, equipment, etc.	☐ 91. Bridge replacement
☐ 32. Clean-up following storm damage	☐ 65. Pole and/or tower installation and/or extension	☐ 92. Return of archaeological remains to former burial sites
☐ 33. Removal of hazardous trees/tree branches		

STEP 3) Project includes one or more activities in Table 3?☒ **YES (Go to Step 4)**☐ **NO (Go to Step 13)**

STEP 4) Answer questions a through e below (applies to projects with activities from Table 3 ONLY)

- a) Will project involve continuous noise (i.e., ≥ 24 hrs) that is greater than 75 decibels measured on the A scale (e.g., loud machinery)? ☒ **NO** (NV2 does not apply) ☐ **YES** (NV2 applies, subject to records review)
- b) Will project involve entry into/survey of cave, bridge, other structure (potential bat roost)? ☐ **NO** (HP1/HP2 do not apply) ☒ **YES** (HP1/HP2 applies, subject to review of bat records)
- c) If conducting **prescribed burning (activity 23)**, estimated acreage: and timeframe(s) below; ☒ **N/A**

STATE	SWARMING	WINTER	NON-WINTER	PUP
GA, KY, TN	☐ Oct 15 - Nov 14	☐ Nov 15 - Mar 31	☐ Apr 1 - May 31, Aug 1 - Oct 14	☐ Jun 1 - Jul 31
VA	☐ Sep 16 - Nov 15	☐ Nov 16 - Apr 14	☐ Apr 15 - May 31, Aug 1 - Sept 15	☐ Jun 1 - Jul 31
AL	☐ Oct 15 - Nov 14	☐ Nov 15 - Mar 15	☐ Mar 16 - May 31, Aug 1 - Oct 14	☐ Jun 1 - Jul 31
NC	☐ Oct 15 - Nov 14	☐ Nov 15 - Apr 15	☐ Apr 16 - May 31, Aug 1 - Oct 14	☐ Jun 1 - Jul 31
MS	☐ Oct 1 - Nov 14	☐ Nov 15 - Apr 14	☐ Apr 15 - May 31, Aug 1 - Sept 30	☐ Jun 1 - Jul 31

- d) Will the project involve vegetation piling/burning? ☒ **NO** (SSPC4/ SHF7/SHF8 do not apply) ☐ **YES** (SSPC4/SHF7/SHF8 applies, subject to review of bat records)

- e) If **tree removal (activity 33 or 34)**, estimated amount: ☐ ac ☐ trees ☒ **N/A**

STATE	SWARMING	WINTER	NON-WINTER	PUP
GA, KY, TN	☐ Oct 15 - Nov 14	☐ Nov 15 - Mar 31	☐ Apr 1 - May 31, Aug 1 - Oct 14	☐ Jun 1 - Jul 31
VA	☐ Sep 16 - Nov 15	☐ Nov 16 - Apr 14	☐ Apr 15 - May 31, Aug 1 - Sept 15	☐ Jun 1 - Jul 31
AL	☐ Oct 15 - Nov 14	☐ Nov 15 - Mar 15	☐ Mar 16 - May 31, Aug 1 - Oct 14	☐ Jun 1 - Jul 31
NC	☐ Oct 15 - Nov 14	☐ Nov 15 - Apr 15	☐ Apr 16 - May 31, Aug 1 - Oct 14	☐ Jun 1 - Jul 31
MS	☐ Oct 1 - Nov 14	☐ Nov 15 - Apr 14	☐ Apr 15 - May 31, Aug 1 - Sept 30	☐ Jun 1 - Jul 31

If warranted, does project have flexibility for bat surveys (May 15-Aug 15): ☐ **MAYBE** ☒ **YES** ☐ **NO**

SECTION 2: REVIEW OF BAT RECORDS (applies to projects with activities from Table 3 ONLY)**STEP 5) Review of bat/cave records conducted by Heritage/OSAR reviewer?**

- ☒ **YES** ☐ **NO** (If NO and includes Table 3 activities, submit project / relevant information [e.g., maps] for review by Terrestrial Zoologist.)

Info below completed by:	☐ Heritage Reviewer (name)		Date	
	☐ OSAR Reviewer (name)		Date	
	☒ Terrestrial Zoologist (name)	Elizabeth Hamrick	Date	Mar 13, 2019

Gray bat records: ☒ None ☐ Within 3 miles* ☐ Within a cave* ☐ Within the County

Indiana bat records: ☒ None ☐ Within 10 miles* ☐ Within a cave* ☐ Capture/roost tree* ☐ Within the County

Northern long-eared bat records: ☒ None ☐ Within 5 miles* ☐ Within a cave* ☐ Capture/roost tree* ☐ Within the County

Virginia big-eared bat records: ☒ None ☐ Within 10 miles* ☐ Within the County

Caves: ☒ None within 3 mi ☐ Within 3 miles but > 0.5 mi ☐ Within 0.5 mi but > 0.25 mi* ☐ Within 0.25 mi but > 200 feet* ☐ Within 200 feet*

Bat Habitat Inspection Sheet completed? ☒ **NO** ☐ **YES**

Amount of SUITABLE habitat to be removed/burned (may differ from STEP 4e): (☐ ac ☐ trees)* ☒ **N/A**

STEP 6) If reviewed by Heritage/OSAR reviewer, does records review trigger need for additional review by Terrestrial Zoologist (noted by * in Step 5)?

- ☐ NO (Go to Step 13)
 ☒ YES (Submit for Terrestrial Zoology review)
 ☐ YES, however, based on Heritage Data review guidelines (or discussion with Terrestrial Zoology), project does not need to be submitted to Terrestrial Zoology for review. (Go to Step 13)

Notes (additional information from field review or explanation of no impact):

STEPS 7-12 To be Completed by Terrestrial Zoologist (if warranted):

STEP 7) Project will involve:

- ☐ Removal of suitable trees within 0.5 mile of P1-P2 Indiana bat hibernacula or 0.25 mile of P3-P4 Indiana bat hibernacula or any NLEB hibernacula.
☐ Removal of suitable trees within 10 miles of documented Indiana bat (or within 5 miles of NLEB) hibernacula.
☐ Removal of suitable trees > 10 miles from documented Indiana bat (> 5 miles from NLEB) hibernacula.
☐ Removal of trees within 150 feet of a documented Indiana bat or northern long-eared bat maternity roost tree.
☐ Removal of suitable trees within 2.5 miles of Indiana bat roost trees or within 5 miles of Indiana bat capture sites.
☐ Removal of suitable trees > 2.5 miles from Indiana bat roost trees or > 5 miles from Indiana bat capture sites.
☐ Removal of documented Indiana bat or NLEB roost tree, if still suitable.
☒ N/A

STEP 8) Presence/absence surveys were/will be conducted: ☒ YES ☐ NO ☐ TBD

STEP 9) Presence/absence survey results, on ☐ NEGATIVE ☐ POSITIVE ☐ N/A

STEP 10) Project ☐ WILL ☒ WILL NOT require use of Incidental Take in the amount of ☐ acres or ☐ trees proposed to be used during the ☐ WINTER ☐ VOLANT SEASON ☐ NON-VOLANT SEASON ☒ N/A

STEP 11) Available Incidental Take (prior to accounting for this project) as of

TVA Action	Total 20-year	Winter	Volant Season	Non-Volant Season
5 Operate, Maintain, Retire, Expand, Construct Power Plants				

STEP 12) Amount contributed to TVA's Bat Conservation Fund upon activity completion: \$ OR ☒ N/A

SECTION 3: REQUIRED CONSERVATION MEASURES

STEP 13a) If answer to STEP 3 is NO, (Project Lead or OSAR/Heritage Reviewer) is to review Conservation Measures in Table 4 and ensure these selected Conservation Measures are relevant to project. If not manually override and uncheck.

Go to Step 14

STEP 13b) If answer to STEP 3 is YES, and answer to STEP 6 is NO, OSAR/Heritage Reviewer is to review Conservation Measures in Table 4 that and ensure these selected Conservation Measures are relevant to project. If not manually override and uncheck.

Go to Step 14

STEP 13c) If answer to STEP 3 is YES, and answer to STEP 6 is YES, Terrestrial Zoologist is to review Conservation Measures in Table 4 and ensure these selected Conservation Measures are relevant to project. If not manually override and uncheck.

Go to Step 15

Table 4. TVA's ESA Section 7 Programmatic Bat Consultation Required Conservation Measures

The Conservation Measures in Table 4 are automatically selected based on your choices in Tables 2 and 3 but can be manually overridden, if necessary. To Manually override, press the button and enter your name.

Manual Override

Name: Elizabeth Hamrick

Check if applies to Project	Activities Subject to Conservation Measure	Conservation Measure Description
☐	15, 16, 17, 18, 22, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 45, 47, 48, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 90, 91, 92, 93, 94, 95, 96	NV1 - Noise will be short-term, transient, and not significantly different from urban interface or natural events (i.e., thunderstorms) that bats are frequently exposed to when present on the landscape.
☐	69, 77, 89, 91	AR1 - Projects that involve structural modification or demolition of buildings, bridges, and potentially suitable box culverts, will require assessment to determine if structure has characteristics that make it a potentially suitable unconventional bat roost. If so a survey to determine if bats may be present will be conducted. Structural assessment will include: ○ Visual check that includes an exhaustive internal/external inspection of building to look for evidence of bats (e.g., bat droppings, roost entrance/exit holes); this can be done at any time of year, preferably when bats are active. ○ Where accessible and health and safety considerations allow, a survey of roof space for evidence of bats (e.g., droppings, scratch marks, staining, sightings), noting relevant characteristics of internal features that provide potential access points and roosting opportunities. Suitable characteristic may include: gaps between tiles and roof lining, access points via eaves, gaps between timbers or around mortise joints, gaps around top and gable end walls, gaps within roof walling or around tops of chimney breasts, and clean ridge beams. ○ Features with high-medium likelihood of harboring bats but cannot be checked visually include soffits, cavity walls, space between roof covering and roof lining. ○ Applies to box culverts that are at least 5 feet (1.5 meters) tall and with one or more of the following characteristics. Suitable culverts for bat day roosts have the following characteristics: • Location in relatively warm areas • Between 5-10 feet (1.5-3 meters) tall and 300 ft (100 m) or more long • Openings protected from high winds • Not susceptible to flooding • Inner areas relatively dark with roughened walls or ceilings • Crevices, imperfections, or swallow nests ○ Bridge survey protocols will be adapted from the Programmatic Biological Opinion for the Federal Highway Administration (Appendix D of USFWS 2016c, which includes a Bridge Structure Assessment Guidance and a Bridge Structure Assessment Form). ○ Bat surveys usually are NOT needed in the following circumstances: • Domestic garages /sheds with no enclosed roof space (with no ceiling) • Modern flat-roofed buildings • Metal framed and roofed buildings • Buildings where roof space is regularly used (e.g., attic space converted to living space, living space open to rafters) or where all roof space is lit from skylights or windows. Large/tall roof spaces may be dark enough at apex to provide roost space

Project Review Form - TVA Bat Strategy (12/2018)

Check if applies to Project	Activities Subject to Conservation Measure	Conservation Measure Description
☒	69, 77, 89, 91	AR2 - Additional bat P/A surveys (e.g., emergence counts) conducted if warranted (i.e., when AR1 indicates that bats may be present).
☐	16, 17, 18, 21, 22, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 48, 50, 51, 52, 53, 54, 55, 58, 59, 60, 61, 62, 63, 64, 65, 67, 70, 71, 73, 76, 77, 78, 80, 81, 82, 83, 86, 87, 88, 89, 90	SSPC2 - Operations involving chemical/fuel storage or resupply and vehicle servicing will be handled outside of riparian zones (streamside management zones) in a manner to prevent these items from reaching a watercourse. Earthen berms or other effective means are installed to protect stream channel from direct surface runoff. Servicing will be done with care to avoid leakage, spillage, and subsequent stream, wetland, or ground water contamination. Oil waste, filters, other litter will be collected and disposed of properly. Equipment servicing and chemical/fuel storage will be limited to locations greater than 300-ft from sinkholes, fissures, or areas draining into known sinkholes, fissures, or other karst features.

Project Review Form - TVA Bat Strategy (12/2018)

Check if applies to Project	Activities Subject to Conservation Measure	Conservation Measure Description
☒	16, 17, 18, 21, 22, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 48, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 61, 62, 63, 64, 65, 67, 69, 70, 71, 73, 76, 77, 80, 81, 82, 83, 84, 86, 87, 88, 89, 90, 91	SSPC3 (Power Plants only) - Power Plant actions and activities will continue to implement standard environmental practices. These include: ○ Best Management Practices (BMPs) in accordance with regulations: • Ensure proper disposal of waste, ex: used rags, used oil, empty containers, general trash, dependent on plant policy • Maintain every site with well-equipped spill response kits, included in some heavy equipment • Conduct Quarterly Internal Environmental Field Assessments at each sight • Every project must have an approved work package that contains an environmental checklist that is approved by sight Environmental Health & Safety consultant. • When refueling, vehicle is positioned as close to pump as possible to prevent drips, and overfilling of tank. Hose and nozzle are held in a vertical position to prevent spillage ○ Construction Site Protection Methods • Sediment basin for runoff - used to trap sediments and temporarily detain runoff on larger construction sites • Storm drain protection device • Check dam to help slow down silt flow • Silt fencing to reduce sediment movement ○ Storm Water Pollution Prevention (SWPP) Pollution Control Strategies • Minimize storm water contact with disturbed soils at construction site • Protect disturbed soil areas from erosion • Minimize sediment in storm water before discharge • Prevent storm water contact with other pollutants • Construction sites also may be required to have a storm water permit, depending on size of land disturbance (>1ac) ○ Every site has a Spill Prevention and Control Countermeasures (SPCC) Plan and requires training. Several hundred pieces of equipment often managed at the same time on power generation properties. Goal is to • Minimize fuel and chemical use • Ensure proper disposal of waste, ex: used rags, used oil, empty containers, general trash, dependent on plant policy • Maintain every site with well-equipped spill response kits, included in some heavy equipment • Conduct Quarterly Internal Environmental Field Assessments at each sight • Every project must have an approved work package that contains an environmental checklist that is approved by sight Environmental Health & Safety consultant. • When refueling, vehicle is positioned as close to pump as possible to prevent drips, and overfilling of tank. Hose and nozzle are held in a vertical position to prevent spillage ○ Construction Site Protection Methods • Sediment basin for runoff - used to trap sediments and temporarily detain runoff on larger construction sites • Storm drain protection device • Check dam to help slow down silt flow • Silt fencing to reduce sediment movement ○ Storm Water Pollution Prevention (SWPP) Pollution Control Strategies • Minimize storm water contact with disturbed soils at construction site • Protect disturbed soil areas from erosion • Minimize sediment in storm water before discharge • Prevent storm water contact with other pollutants • Construction sites also may be required to have a storm water permit, depending on size of land disturbance (>1ac) ○ Every site has a Spill Prevention and Control Countermeasures (SPCC) Plan and requires training. Several hundred pieces of equipment often managed at the same time on power generation properties. Goal is to minimize fuel and chemical use
☒	16, 26, 36, 37, 38, 39, 48, 50, 52, 59, 60, 62, 66, 67, 69, 72, 75, 77, 78, 79, 86	L1 - Direct temporary lighting away from suitable habitat during the active season.
☒	16, 26, 36, 37, 38, 39, 48, 50, 52, 59, 60, 62, 66, 67, 69, 72, 75, 77, 78, 79, 86	L2 - Evaluate the use of outdoor lighting during the active season and seek to minimize light pollution when installing new or replacing existing permanent lights by angling lights downward or via other light minimization measures (e.g., dimming, directed lighting, motion-sensitive lighting).

Project Review Form - TVA Bat Strategy (12/2018)

¹Bats addressed in consultation (02/2018), which includes gray bat (listed in 1976), Indiana bat (listed in 1967), northern long-eared bat (listed in 2015), and Virginia big-eared bat (listed in 1979).

Hide All Unchecked Conservation Measures

- ☒ HIDE
- ☐ UNHIDE

STEP 14) Save completed form in project environmental documentation (e.g., CEC, Appendix to EA) AND send a copy of form to batstrategy@tva.gov. Submission of this form indicates that Project Lead/Applicant:

(name) is (or will be made) aware of the requirements below.

- Implementation of conservation measures identified in Table 4 is required to comply with TVA's Endangered Species Act programmatic bat consultation.
- TVA may conduct post-project monitoring to determine if conservation measures were effective in minimizing or avoiding impacts to federally listed bats.

STEP 15) For Use by Terrestrial Zoologist if Project and Form are Submitted for Review

☒ Terrestrial Zoologist acknowledges that Project Lead/Contact (name) has been informed on (date) of any relevant conservation measures and/or provided a copy of this form.

☐ For projects that require use of Take and/or contribution to TVA's Bat Conservation Fund, Terrestrial Zoologist acknowledges that Project Lead/Contact has been informed that project will result in use of Incidental Take ☐ ac ☐ trees and that use of Take will require contribution to TVA's Conservation Fund upon completion of activity (amount entered should be \$0 if cleared in winter).

Finalize and Print to Noneditable PDF. Changes to form cannot be made after this button is selected.

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Appendix C – Coordination



United States Department of the Interior

FISH AND WILDLIFE SERVICE

Tennessee ES Office
446 Neal Street
Cookeville, Tennessee 38501



September 12, 2019

John T. Baxter, Jr.
Tennessee Valley Authority
Environmental Permits and Compliance
400 West Summit Hill Drive
Knoxville, Tennessee 37902-1499

Subject: FWS # 2019-CPA-0756. Tennessee Valley Authority. Proposed Allen Fossil Plant Demolition, Shelby County, Tennessee.

Dear Mr. Baxter:

Personnel of the U.S. Fish and Wildlife Service (Service) have reviewed your letter dated August 15, 2019, concerning the Tennessee Valley Authority's (TVA) proposed alternatives for disposition of the permanently retired Allen Fossil Plant (ALF) located near Memphis, Tennessee adjacent to the Mississippi River and McKellar Lake, Shelby County, Tennessee. The preferred alternative would be the demolition of coal-fired units 1-3 and other structures including potential blasting of three emission stacks. Each stack is 400 feet tall and could be removed by dropping them using controlled demolition to ensure they fall in a specific direction; mechanical deconstruction; or a combination of the previous two methods. TVA has also identified four areas proposed for use as temporary laydown areas during construction and one area near the Allen Combined Cycle (ACC) Plant designated for light uses such as trailer placement or light vehicle parking.

Your review of the TVA Regional Natural Heritage database and the U.S. Fish and Wildlife Service IPaC website indicated four species listed as endangered, threatened, candidate, or delisted and monitored under the Endangered Species Act are reported from Shelby County, Tennessee, and may occur within the project action area. These species include two birds (least interior tern and piping plover) and two mammals (Indiana bat and northern long-eared bat) that have the potential to occur within Shelby County based on historic range, proximity to known occurrence records, biological characteristics and/or physiographic characteristics. Additionally bald eagles are known from property adjacent to ALF and ACC.

As indicated in your correspondence, interior least terns have been documented on ALF property in 2010, 2011, 2013, and 2019. Occurrence of nesting colonies at ALF ash ponds typically coincides with prolonged flooding along the nearby Mississippi River. When nesting activity is

observed at the site, TVA has implemented road closures, fencing, and other protective measures to avoid nest disruption. However, nesting success at the site has been extremely low, likely due to predation and heavy rains that inundate the nests.

In order to avoid adverse impacts to least terns at ALF in future years, the following measures would be put in place:

- 1) Surveys of the ALF D4 project areas would occur in late April of any given year (for the duration of the project) to identify any exposed ash, gravel, or sand-like substrate that could provide nesting habitat for least terns.
- 2) Weekly observations of these potential nesting sites would occur beginning in mid-May and ending in mid-August of any given year (for the duration of the project) to identify any terns that return to the area.
- 3) If terns return to the ACC and are seen landing in the ACC gravel lot, the area will be vacated immediately. All personnel, equipment, and vehicles would be removed within a few days and the area will no longer be used again until all terns have left the area or until the end of September when birds are finished nesting, whichever comes first.
- 4) If terns return to ALF and are seen nesting in the East Ash Pond, no demolition or loud activities would be permitted within 300 feet of the nests.
- 5) If any of measures 1-4 cannot be met, TVA would reinitiate consultation with USFWS.

Based on distance from recently observed nesting locations from the proposed demolition actions, behavior/tolerance of terns to human interaction in previous years, and the avoidance measures listed above, TVA has determined that interior least terns may be affected but would not be adversely affected by the proposed actions. Additionally, TVA proposes to survey buildings slated for demolition for use by bats at least one month prior to demolition, and to stop demolition activities at these facilities to consult with USFWS if federally listed bats are observed. TVA has determined that these effects are not likely to adversely affect Indiana bat and northern long-eared bat. The Service concurs with TVA's determinations of not likely to adversely affect for the interior least tern, Indiana bat, and northern long-eared bat. The Service also agrees that TVA is in compliance with the National Bald Eagle Management Guidelines and with the no effect determination for the piping plover.

Our database does not indicate any other federally listed species that could be impacted by the project. In view of this, we believe that the requirements of section 7 of the Endangered Species Act (Act) have been fulfilled. However, obligations under section 7 of the Act must be reconsidered if: (1) new information reveals that the proposed action may affect listed species in a manner or to an extent not previously considered, (2) the proposed action is subsequently modified to include activities which were not considered in this biological assessment, or (3) new species are listed or critical habitat designated that might be affected by the proposed action.

The Service greatly appreciates TVA's past efforts of protecting interior least terns when observed at the site, as well as the proposed protective measures for future activities. Please contact Robbie Sykes of my staff at 931/525-4979 or robbie_sykes@fws.gov if you have questions regarding the information provided in this letter.

Sincerely,

A handwritten signature in blue ink, appearing to read "Virgil E. Andrews, Jr.", followed by a small flourish.

Virgil Lee Andrews, Jr.
Field Supervisor



Tennessee Valley Authority, 400 West Summit Hill Drive, Knoxville, TN 37902

June 27, 2014

Mr. E. Patrick McIntyre, Jr.
Executive Director
Tennessee Historical Commission
2941 Lebanon Road
Nashville, Tennessee 37243-0442

Dear Mr. McIntyre:

TENNESSEE VALLEY AUTHORITY (TVA), PROSED ALLEN FOSSIL PLANT EMISSION CONTROL PROJECT, SHELBY COUNTY, TENNESSEE

TVA proposes to construct and operate a new natural gas-fired, combined-cycle, combustion-turbine electrical generating facility ("CC/CT Facility") in Shelby County, Tennessee. The proposed CC/CT Facility would be built just south of the Allen Fossil Plant (ALF) on a 73-acre site that TVA currently leases. TVA has determined that its proposal to construct a CC/CT Facility is an undertaking (as defined at 36 CFR § 800.16(y)) that has the potential to cause effects on historic properties. Therefore, we are initiating consultation under Section 106 of the National Historic Preservation Act for this undertaking.

Three related actions would occur as a result of TVA's proposal to construct a CC/CT Facility:

- (1) Construction and operation of a high-pressure gas pipeline to supply the CC/CT Facility with natural gas.
- (2) Construction and operation of two new 161-kilovolt (kV) electrical transmission lines to connect the CC/CT transformers to an existing 161-kV substation at ALF.
- (3) Construction of a gray water supply line for condenser cooling. The gray water would be supplied from the adjacent Maxson Waste Water Treatment Plant, and the supply line would be built by the City of Memphis, Division of Public Works.

Plans are currently available to assess the impact on historic properties from construction of, and operation of, the CC/CT Facility and the natural gas pipeline. However, TVA does not yet have plans for the related actions to construct the transmission lines and the gray water supply line to assess impacts to historic properties. The exact placement of the 161-kV transmission line would depend on the design of the CC/CT Facility, which is not yet completed. Although the proposed gray water line is expected to be located within previously disturbed areas within Laydown Area 1, the exact location has not been determined.

Accordingly, pursuant to 36 CFR Part 800.4(b)(2) TVA will use a phased identification and evaluation process for the identification of historic properties, evaluations of effect, and resolution of adverse effects associated with the different phases of this undertaking. At

Mr. E. Patrick McIntyre, Jr.
Page Two
June 27, 2014

present, TVA is consulting with respect to phases of the undertaking involving construction of the CC/CT Facility and the high pressure gas pipeline. TVA will consult further with your office when detailed plans relating to phases involving construction of transmission lines and gray water supply lines are available.

TVA has determined that the area of potential effects (APE) (for archaeological resources) for phases of the undertaking involving the construction and operation of the CC/CT Facility and the natural gas pipeline encompasses the following three areas: (1) the area where the CC/CT facility and associated infrastructure including a switchyard, stormwater ponds, and possibly fuel oil backup tanks and associated backup fuel systems would be built (approximately 73 acres); (2) two construction laydown areas (approximately 151 acres); and (3) approximately 13 miles of right-of-way (ROW) associated with the proposed 24-inch XXHP gas pipeline. This ROW would be fully within an existing utility corridor with overall widths varying from 250 feet to 420 feet. This corridor contains existing ROWs for the Memphis, Light, Gas and Water (MLGW) 16-inch and 22-inch gas pipelines, MLGW transmission lines, and a TVA transmission line. The new 24-inch pipeline would tap into an existing MLGW pipeline at the Airways Gate Station (near Airways Boulevard), and the route would parallel an existing 16-inch MLGW line that supplies the existing CT units at ALF. This route would proceed westward for approximately seven miles, and would then turn toward the northwest and north into the proposed CC/CT facility. The new pipeline would be constructed along the southern and western extent of the existing utility corridor. Installation of the new pipeline would be accomplished with a combination of cut-and-cover and/or directional boring methods. Backhoes or trenching equipment would be used to excavate a trench seven- to nine-feet deep and five- to seven-feet wide, and the trench would provide approximately three feet of cover for the pipeline.

TVA had not determined the precise pipeline location when the cultural resources survey was initiated. Therefore, the entire 250- to 420-foot wide utility corridor for the 13-mile proposed route was considered part of the APE for archaeological resources. Further, TVA has determined that the APE for above-ground resources (i.e. historic structures) consists of a one-mile radius surrounding the proposed CC/CT Facility. Although TVA has not yet completed designs for the facility, those designs will include two to four exhaust stacks. The exhaust stacks would be at least 165-feet tall, but would not exceed 195 feet in height. The analysis of impacts to historic structures was performed on the assumption of stacks that would be 195 feet in height.

TVA contracted with Tennessee Valley Archaeological Research (TVAR) to perform a Phase I cultural resources survey of the APE. Enclosed are two copies of the draft report titled, *Phase I Cultural Resources Survey of Tennessee Valley Authority's Proposed Allen Fossil Plant Emission Control Project, Shelby County, Tennessee*, along with three CDs containing digital copies of the report.

Background research completed prior to the field study indicated that two previously-recorded archaeological sites are located within the APE: 40SY554 and 40SY566. Site 40SY554, a small historic scatter, was investigated by TRC Garrow in 1994 during a cultural resources survey of the Frank C. Pidgeon Industrial Park, and the report authors recommended the site ineligible for listing in the National Register of Historic Places (NRHP) due to a lack of integrity. TVAR's

investigation revealed evidence that the entire site has been destroyed, and TVAR recommends no further investigations of the site. Site 40SY566, Ensley Plantation, has been investigated previously by TRC and Panamerican Consultants, Inc. (PCI). PCI recommended the site ineligible for NRHP listing based on a lack of integrity. TVAR investigated the location of Site 40SY566 within Laydown Area 2 and identified no cultural deposits. The portion of the site within the APE is covered by several feet of modern fill. Therefore, TVAR recommended no additional investigation of Site 40SY566, finding it to be ineligible for listing on the NRHP. TVAR's survey also identified four previously unrecorded archaeological sites (40SY750-40SY753) and 14 isolated finds. The report authors recommend that sites 40SY750 and 40SY751 and the 14 isolated finds are ineligible for the NRHP due to a lack of research potential. TVA agrees with the aforementioned recommendations and findings made by TVAR. As to Sites 40SY752 and 40SY753, TVAR also recommends that the sites may have potential to yield significant data related to questions about mid-19th to early-20th century rural life in Shelby County, Tennessee. However, the data generated by the Phase I survey is insufficient to make a determination of eligibility, and TVA considers these sites to be of undetermined eligibility for the NRHP. TVA will avoid adverse project effects to these two sites by either installing the pipeline at least 33 feet/10 meters south of the sites, or by using the directional bore method to install the pipeline below the sites. Either method would avoid surficial ground disturbance within the site boundaries.

Background research indicated that there are no previously recorded historic architectural resources within the one-mile architectural APE. Archaeological site 40SY1 (Chucalissa), which includes above-ground features (mounds), is located within the architectural APE. This site is listed in the NRHP and is a National Historic Landmark. TVAR evaluated possible visual effects to the site from construction of the CC/CT Facility and recommends that although the undertaking would have a minor visual effect, the effect would not be adverse. TVA agrees with this recommendation. Site 40SY1 is visually buffered by dense foliage from the commercial development that is occurring west of the site. Staff of T.O. Fuller State Park indicated that visible impacts from on-going commercial development have not been an issue at the site. Presently, the only commercial features visible from the site (looking to the west) are the ALF stacks, which are 400-feet tall. Although not visible from most areas within 40SY1, the stacks can be seen from the top of the platform mound and from the plaza, through small gaps in the bordering vegetation. A wooded buffer zone prevents the ALF stacks from being visible from other locations at the site. Because the maximum height of the proposed CT/CC facility is 205-feet lower in height than the ALF stacks, they are expected to be out of view from 40SY1 site under most circumstances. Although the proposed CC/CT Facility may at times (e.g., winter) be visible from this same location, it would not alter the existing visual setting as presently found from atop the platform mound.

TVAR also completed an architectural assessment of ALF and recommends that ALF is ineligible for listing in the NRHP due to a lack of architectural distinction and to loss of integrity resulting from extensive modern alterations. TVA agrees with this recommendation.

Pursuant to 36 CFR Sections 800.4(d)(1) and 800.5(b), we are seeking your concurrence with TVA's findings and determinations, summarized below with respect to phases of TVA's

Mr. E. Patrick McIntyre, Jr.
Page Four
June 27, 2014

undertaking involving construction and operation of the CC/CT Facility and the natural gas pipeline:

- archaeological site 40SY554 is ineligible for listing in the NRHP;
- the portion of archaeological site 40SY566 within the APE contains no intact archaeological deposits;
- archaeological sites 40SY750 and 40SY751, and the fourteen isolated finds, are ineligible for listing in the NRHP;
- archaeological sites 40SY752 and 40SY753 are of undetermined NRHP eligibility;
- 40SY1 (Chucalissa) continues to be eligible for the NRHP and as a National Historic Landmark;
- ALF is ineligible for listing in the NRHP;
- TVA will avoid effects to 40SY752 and 40SY753 by either installing the pipeline south of the sites (outside the site boundaries), or by using directional boring to install the pipeline below the site deposits; and
- the undertaking will not adversely affect 40SY1 (Chucalissa).

Please provide your comment on the above findings. Separately, TVA will consult with your office regarding the other phases of this undertaking involving the construction and operation of the transmission lines and the gray water supply line.

Pursuant to §800.3(f)(2), TVA is consulting with federally recognized Indian tribes regarding historic properties within the APE that may be of religious and cultural significance to the tribes. The tribes involved in this consultation are The Chickasaw Nation, Choctaw Nation of Oklahoma, Jena Band of Choctaw Indians, and United Keetoowah Band of Cherokee Indians in Oklahoma.

Should you have any questions or comments, please contact Richard Yarnell in Knoxville at wryarnel@tva.gov or (865) 632-3463.

Sincerely,



Clinton E. Jones, Manager
Biological and Cultural Compliance
Environmental Permits and Compliance
WT 11B-K

SCC:CSD
Enclosure

cc (Enclosure):

Ms. Jennifer Barnett
Tennessee Division of Archaeology
1216 Foster Avenue, Cole Bldg. #3
Nashville, Tennessee 37210

INTERNAL COPIES ONLY, NOT INCLUDED WITH OUTBOUND LETTER:

Brenda Brickhouse, BR 4A-C

Ashley Farless, BR 4A-C

Amy Henry, WT11D-K

Khurshid Mehta, WT 6A-K

Will Wasdin, BR 4A-C

Richard Yarnell, WT11D-K

EDMS, WT CA-K



TENNESSEE HISTORICAL COMMISSION
2941 LEBANON ROAD
NASHVILLE, TENNESSEE 37243-0442
OFFICE: (615) 532-1550
www.tnhistoricalcommission.org

July 9, 2014

Mr. Clinton Jones
Tennessee Valley Authority
400 West Summit Hill Drive
WT11D
Knoxville, Tennessee 37902-1499

RE: TVA, ALLEN FOSSIL PNT/FACILITY/GAS LINE, UNINCORPORATED,
SHELBY COUNTY

Dear Mr. Jones:

Pursuant to your request, this office has reviewed documentation concerning the above-referenced undertaking received Friday, June 27, 2014. This is a requirement of Section 106 of the National Historic Preservation Act for compliance by the participating federal agency or applicant for federal assistance. Procedures for implementing Section 106 of the Act are codified at 36 CFR 800 (Federal Register, December 12, 2000, 77698-77739).

Considering available information, we concur that a process of Phased Compliance in an appropriate means by which your agency can meet its Section 106 obligations for the Allen Fossil Plant Emission Control Project. We further concur that the portion of the project as currently proposed will not adversely affect any property that is eligible for listing in the National Register of Historic Places. Therefore, this office has no objection to the construction of, and operation of, the CC/CT Facility and the natural gas pipeline portions of the project. Please direct questions and comments to Jennifer M. Barnett (615) 741-1588, ext. 105. We appreciate your cooperation.

Sincerely,

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

EPM/jmb



Tennessee Valley Authority, 400 West Summit Hill Drive, Knoxville, TN 37902

July 5, 2017

Mr. E. Patrick McIntyre, Jr.
Executive Director
Tennessee Historical Commission
2941 Lebanon Pike
Nashville, Tennessee 37243-0442

Dear Mr. McIntyre:

TENNESSEE VALLEY AUTHORITY (TVA), ALLEN FOSSIL PLANT, EAST ASH
IMPOUNDMENT CLOSURE, SHELBY COUNTY, TENNESSEE

TVA proposes to close the East Ash Impoundment at the Allen Fossil Plant (ALF) in Shelby County, Tennessee. TVA has determined that the ALF East Ash Impoundment Project constitutes an undertaking (as defined at 36 CFR § 800.16(y)) that has the potential to cause effects on historic properties. We are initiating consultation under Section 106 of the National Historic Preservation Act for this undertaking.

The East Ash Impoundment is located east of the powerhouse and Coal Yard (Figure 1, below). It abuts the U.S. Army Corps of Engineers (USACE) levee, which borders McKellar Lake. The East Ash Impoundment encompasses approximately 85 acres and includes a dredge cell, an ash impoundment, and a stilling impoundment (Figure 2). These features were created by excavation, grading, and construction of earthen dikes using coal ash and construction fill. TVA is considering several alternatives for the undertaking.

Alternative 1 is the no action alternative. TVA is also considering the following five action alternatives:

Alternative 2a. Closure in place.

This alternative consists of leaving all CCR materials in place, re-grading to create parallel north-south ridge lines, north-south interior ditches, and perimeter ditches directing surface drainage to the northeast and southeast corners and discharging to the wetland. The east berm would be reconfigured to provide soil for cap material and the discharge structures to McKellar Lake would be abandoned.

Alternative 2b. Closure in place.

Alternative 2b consists of excavating and moving the CCR material from the east end of the impoundment to the west end where CCRs will be consolidated and closed in place. The relocation and consolidation of the material is in-lieu of hauling it to an offsite landfill. consolidated CCR materials will be graded to create parallel north-south ridge lines, north-south interior ditches, and perimeter ditches directing surface drainage to the northeast and southeast

corners and discharging to the wetland. The east berm will be excavated to provide soil for cap material.

Alternative 3. Closure-by-removal

This alternative consists of closing the facilities by excavating all CCR material and hauling it to an off-site regulated landfill. This option restores the area to the existing configuration prior to CCR placement, with the exception that most of the berms would be left in place. The east dike would be excavated to provide a drainage outlet as needed. The transportation of CCR material off-site removes the requirement for a low permeability cap. This alternative requires that about 2,500,000 tons of CCR material be hauled offsite on public roads.

Alternative 4a. Combination of Closure-by-Removal & Closure-in-Place.

This alternative consists of excavating a portion of the CCR material from the ash impoundment and hauling it to an offsite regulated landfill. This option restores a portion of the impoundment footprint to the existing configuration prior to CCR placement.

Alternative 4b. Combination of Closure-by-Removal & Closure-in-Place.

Alternative 4b is similar to Alternative 4a with the exception that the remaining CCR materials would be consolidated to the west.

TVA has determined that the Area of Potential Effects (APE) for the proposed undertaking consists of all areas that would be affected by the above-listed activities. These include both the East Ash Impoundment itself and areas west of the powerhouse that would be used as temporary storage and laydown yards during the project. The latter areas include the West Ash Pond and a small additional laydown/storage area west of a wastewater treatment plant (shown in Figure 1). The APE includes all areas within the yellow and red dashed lines in Figure 3. TVA has determined that the undertaking is not of a type with potential to results in adverse effects to any historic architectural resources that may be located within the project area or its viewshed.

The underlying geology of the project area likely consists of unconsolidated alluvial silts and sands. Prior to the construction of ALF, the entire APE was within the active floodplain of the Mississippi River. A 1925 U.S. Geological Survey map of the area depicts these areas as "subject to overflow by Mississippi River" (Figure 4). A 2004 U.S. Geological Survey map showing surficial deposits in the area immediately east of the APE (Moore and Diehl 2004; excerpt shown in Figure 5) unfortunately does not extend to the APE. However, this map does include a portion of the former U.S. Army Corps of Engineers "Ash Disposal Easement Area No. 6", which borders the ALF East Ash Impoundment. Geologic units shown on the western extremity of this map show artificial lands that include the berm surrounding the former USACE Ash Disposal Easement Area 6. That area lies within a wide swath of land bordering McKellar Lake on the south that is described as Qal, Holocene and late Pleistocene alluvium. This unit is described as "fine- to medium-grained quartz and chert ... sand; 205 percent heavy minerals with green olivine(?) and pyroxene(?). Deposit is unconsolidated, friable, and distinctively planar bedded and cross bedded." The thickness of unit Qal is estimated to be 10-35 meters. This description is consistent with an interpretation of a long period of dynamic alluvial activity

throughout the late Pleistocene and Holocene, resulting in a thick deposit of frequently re-worked silts and sands with low potential to contain intact archaeological deposits. The rapid changes in alluvial landforms resulting from Mississippi River high flows and floods are well documented throughout the region's history.

Areas to be used for temporary laydown and storage yards include the West Ash Pond and a parking area at ALF, and a small area west of TE Maxson Wastewater Treatment Plant. Figure 6 shows an enlarged view of the western portions of the APE. Area 1 (the laydown/storage area west of TE Maxson Wastewater Treatment Plant) was included in two previous archaeological surveys (de Gregory 2014, Starr 1994) and no archaeological sites were identified there. Areas 2, 3, and 4 have not been included in any previous archaeological survey. However, these areas have been affected by earth moving construction activities that were part of the construction of ALF. Areas 2 and 3 are atop the West Ash Pond (Figure 7). Area 4 contains a parking area and two grassy strips. Area 4 is shown on the 1991 TVA plan map as "Ash Disposal Area (Abandoned)" (Figure 8). This figure also shows that the plant's discharge pipe underlines Area 4. That pipe was likely installed by excavating a large open trench. The graded and graveled parking area atop this capped ash disposal area would be used as a laydown or storage area during construction.

Figure 9 shows an enlarged view of the East Ash Impoundment portion of the APE. The East Ash Impoundment consists of artificial lands (berms) constructed on a surface of Qal, Holocene and late Pleistocene alluvium. To create the impoundment, TVA constructed earthen dikes on the south and east ends of the area (top elevations of approximately 235 ft amsl), and relied on the USACE artificial levee (top elevation 237 ft amsl) on the north side and naturally high ground on the west side (top elevation 240 ft amsl). In many areas the original surface (elevations between 212 and 222 feet amsl) were excavated or graded during construction of the East Ash Impoundment. This is supported by TVA plan drawings of the general plant area (Figure 8) and of the East Ash Impoundment (Figures 10, 11). Dikes were constructed within the area to create the cells, which were then filled over time with various types of coal combustion products (fly ash, bottom ash, dredged ash and sluiced ash). The USACE's levee construction activities would have required excavation and grading of the original ground surface in areas bordering the levee, which area now within the East Ash Impoundment. Current aerial imagery (seen in Figure 9) documents the disturbed nature of the East Ash Impoundment.

In three areas (6, 7, and 8 in Figure 9) project activities would extend outside the East Ash Impoundment. Area 6 extends a short distance across Plant Road. Area 6 was included in one previous archaeological survey (Starr 1994) and no archaeological sites were identified. Area 7 extends into an area that consists of a capped ash impoundment. Area 8 extends into the USACE levee.

TVA finds that the undertaking would not affect archaeological sites in the APE. Areas west of the powerhouse that would be used for laydown/storage areas have either been surveyed or consist of coal ash and construction fill. The potential for undisturbed native soils or sediments within the East Ash Impoundment appears to be very low to nil.

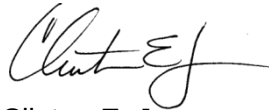
Mr. E. Patrick McIntyre, Jr.
Page 4
July 5, 2017

Pursuant to 36 CFR Part 800.4(d)(1), we are seeking your concurrence on TVA's finding that the undertaking as currently proposed would affect no archaeological sites included in, or eligible for inclusion in, the National Register of Historic Places.

Pursuant to 36 CFR Part 800.3(f)(2), TVA is consulting with federally recognized Indian tribes regarding historic properties within the proposed project's APE that may be of religious and cultural significance and are eligible for the NRHP.

Please contact Ted Wells by telephone, (865) 632-2259 or by email, ewwells@tva.gov with your comments.

Sincerely,



Clinton E. Jones
Manager
Biological and Cultural Compliance

SCC:ABM

Enclosures

cc (Enclosures):

Ms. Jennifer Barnett
Tennessee Division of Archaeology
1216 Foster Avenue, Cole Bldg. #3
Nashville, Tennessee 37210

REFERENCES CITED

De Gregory, J. Rocco, Scott C. Meeks, Ted Karpynek, Katherine Wright, Meghan Weaver and Kate Manning.

2014 *Phase I Cultural Resource Survey of Tennessee Valley Authority's Proposed Allen Fossil Plant Emission Control Project, Shelby County, Tennessee*. Report prepared by Tennessee Valley Archaeological Research, Huntsville Alabama. Prepared for Tennessee Valley Authority, Knoxville, Tennessee.

Starr, Mary Evelyn

1994 *A Cultural Resources Survey of the Frank C. Pidgeon Industrial Park, Shelby County, Tennessee*. Garrow & Associates, Inc., Memphis, Tennessee. Submitted to Oakley, Ellers, Chester, and Rike, Inc., Memphis, Tennessee.

Moore, David W. and Sharon F. Diehl

2004 *Surficial Geologic Map of the Southwest Memphis Quadrangle, Shelby County Tennessee and Crittenden County, Arkansas*. United States Department of the Interior, United States Geological Survey, Scientific Investigations Map 2823.

INTERNAL COPIES ONLY, NOT TO BE INCLUDED WITH OUTGOING LETTER:

A. Michelle Cagley, KFP 1T-KST
Stephen C. Cole, WT 11D-K
Ashley Farless, MR 4G-C
Amy B. Henry, WT 11C-K
Susan R. Jacks, WT 11C-K
M. Susan Smelley, BR 4A-C
Edward W. Wells, WT 11D-K
ECM, WT CA-K



Figure 2. ALF East Ash Impoundment. Base map: satellite image from Bing (downloaded 6/5/2017).

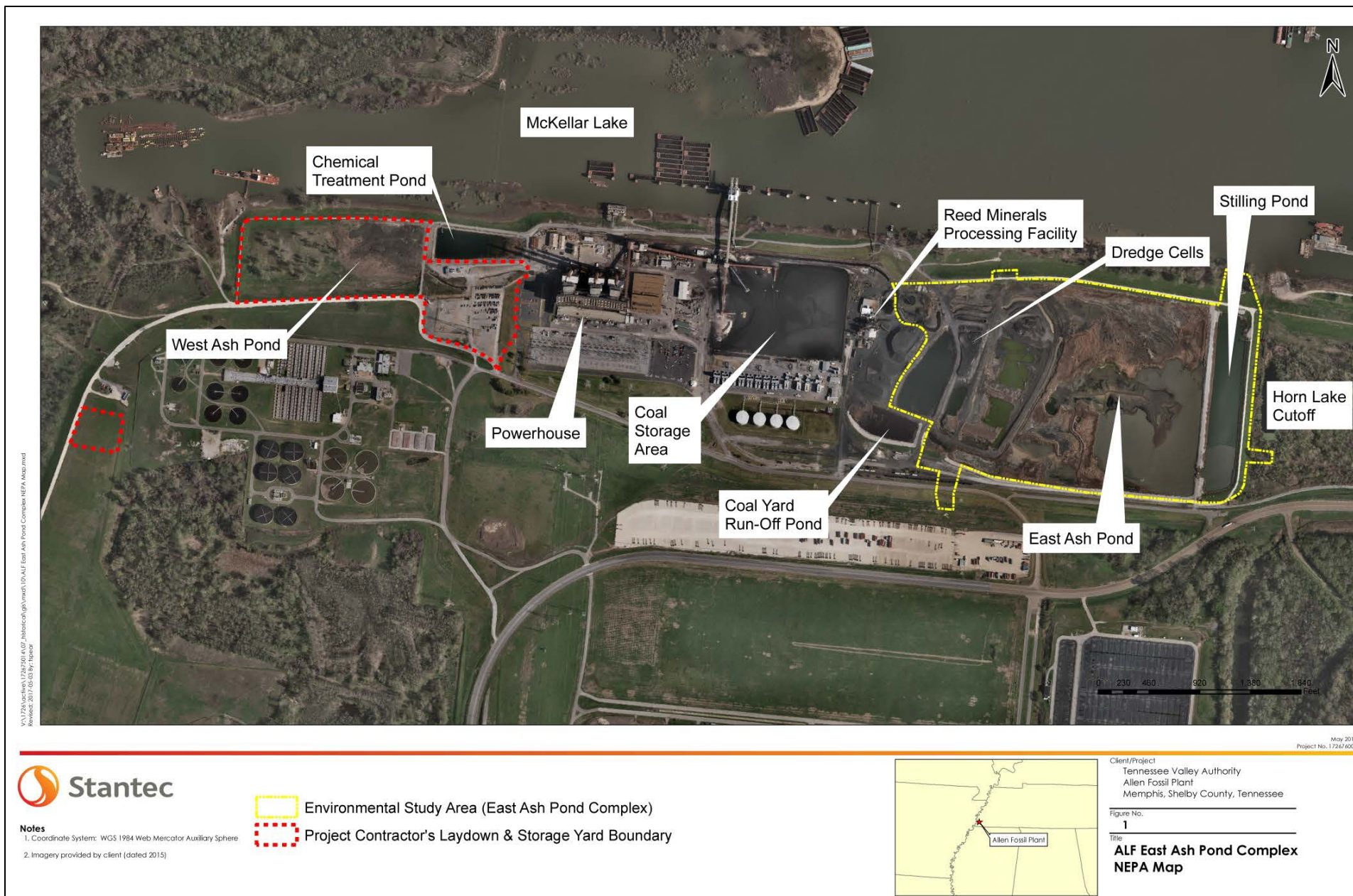


Figure 3. ALF East Ash Impoundment Closure; project areas and various plant facilities.

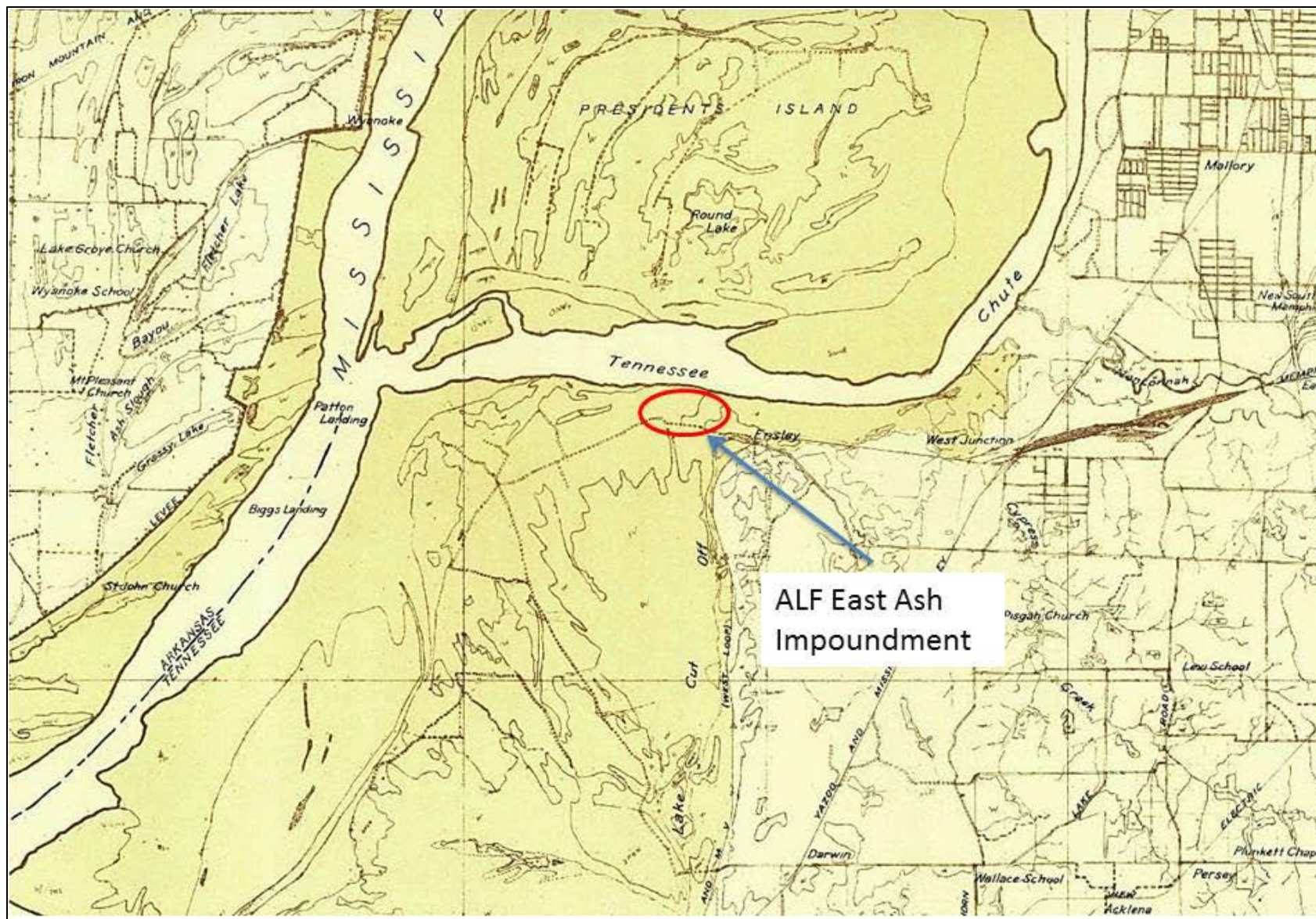


Figure 4. Location of the ALF East Ash Impoundment shown on the 1925 USGS 1:48,000 Southwest Memphis geologic map (excerpt). Shaded areas are “subject to overflow by the Mississippi River”, according to notes on the map.

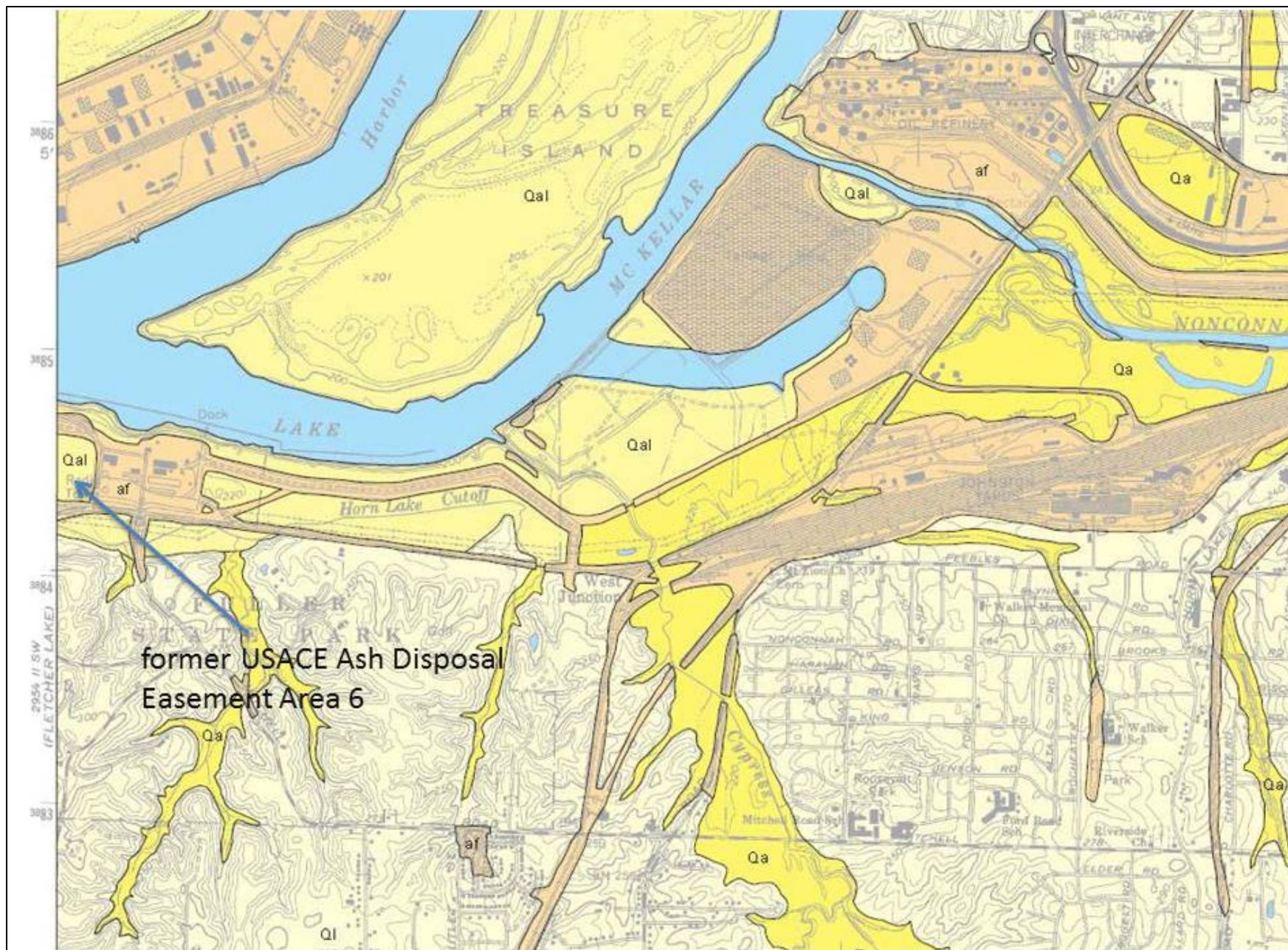
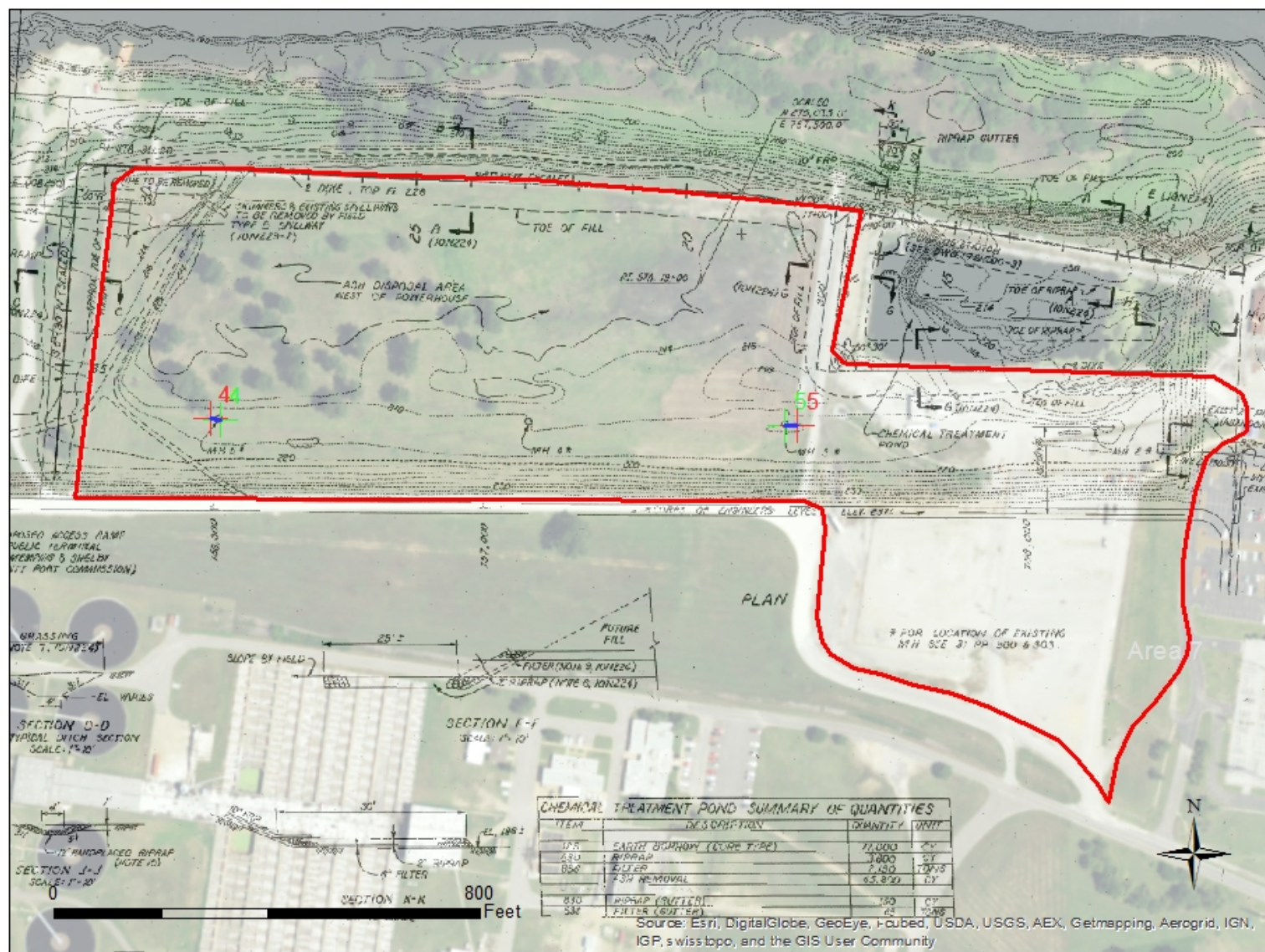


Figure 5. Excerpt from the 2004 USGS "Surficial Geologic Map of the Southwest Memphis Quadrangle, Shelby County Tennessee and Crittenden County, Arkansas." Key to units: Qal, River alluvium (Holocene and late Pleistocene); af, artificial fill (late Holocene); Qa, Creek alluvium (Holocene and late Pleistocene).



Figure 6. Western portion of APE: temporary laydown and storage areas.



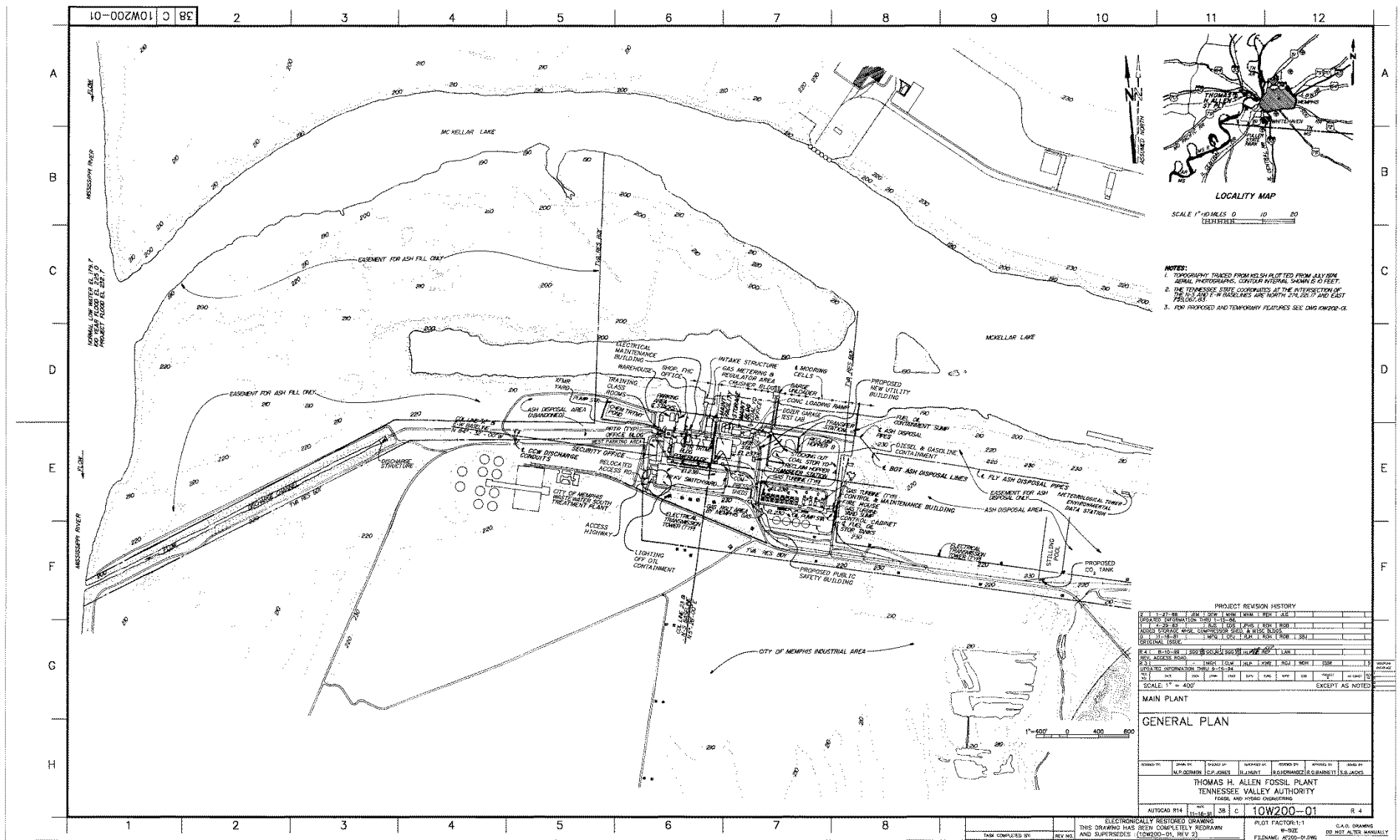


Figure 8. ALF, Main Plant Layout, TVA drawing (1991).

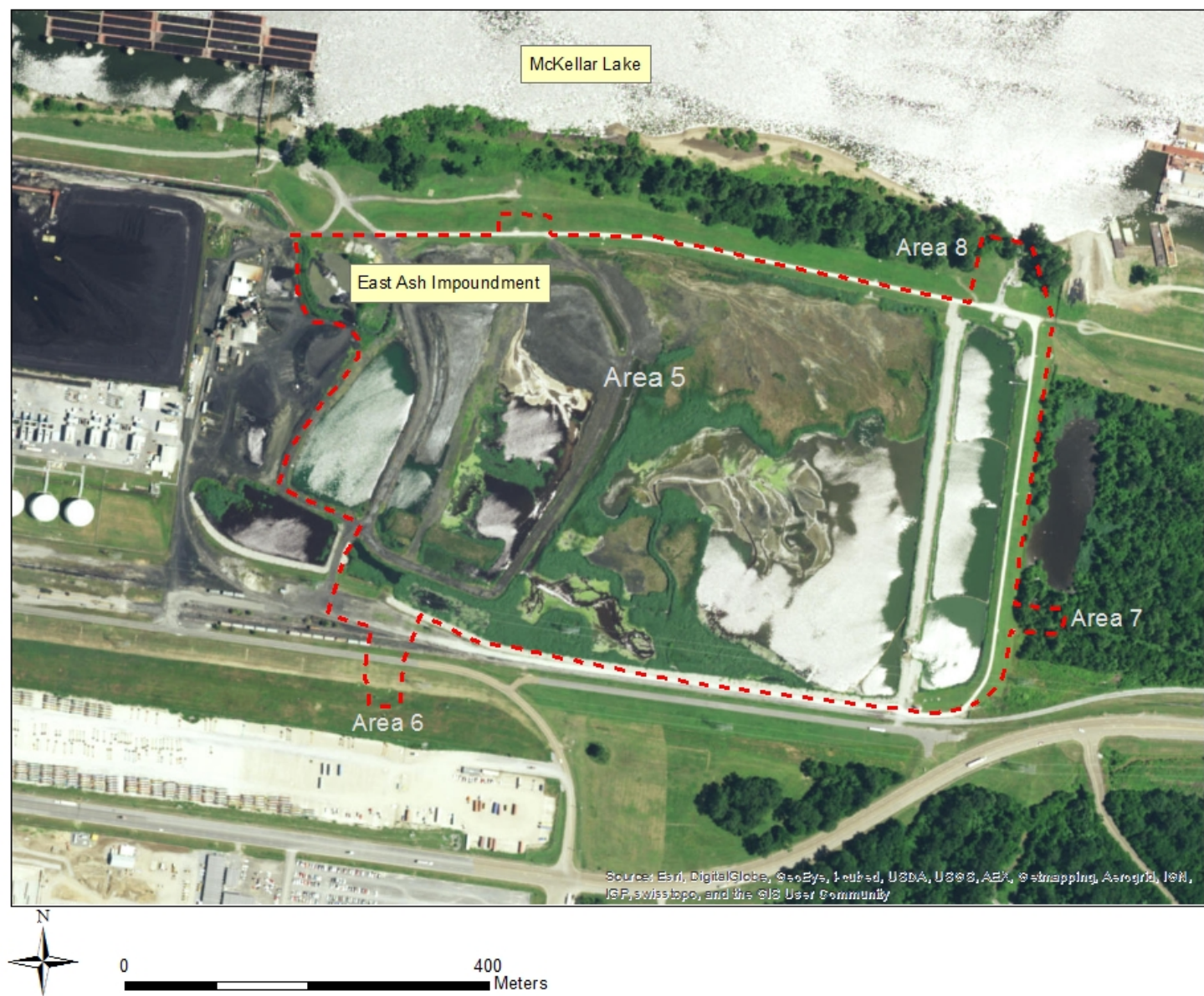
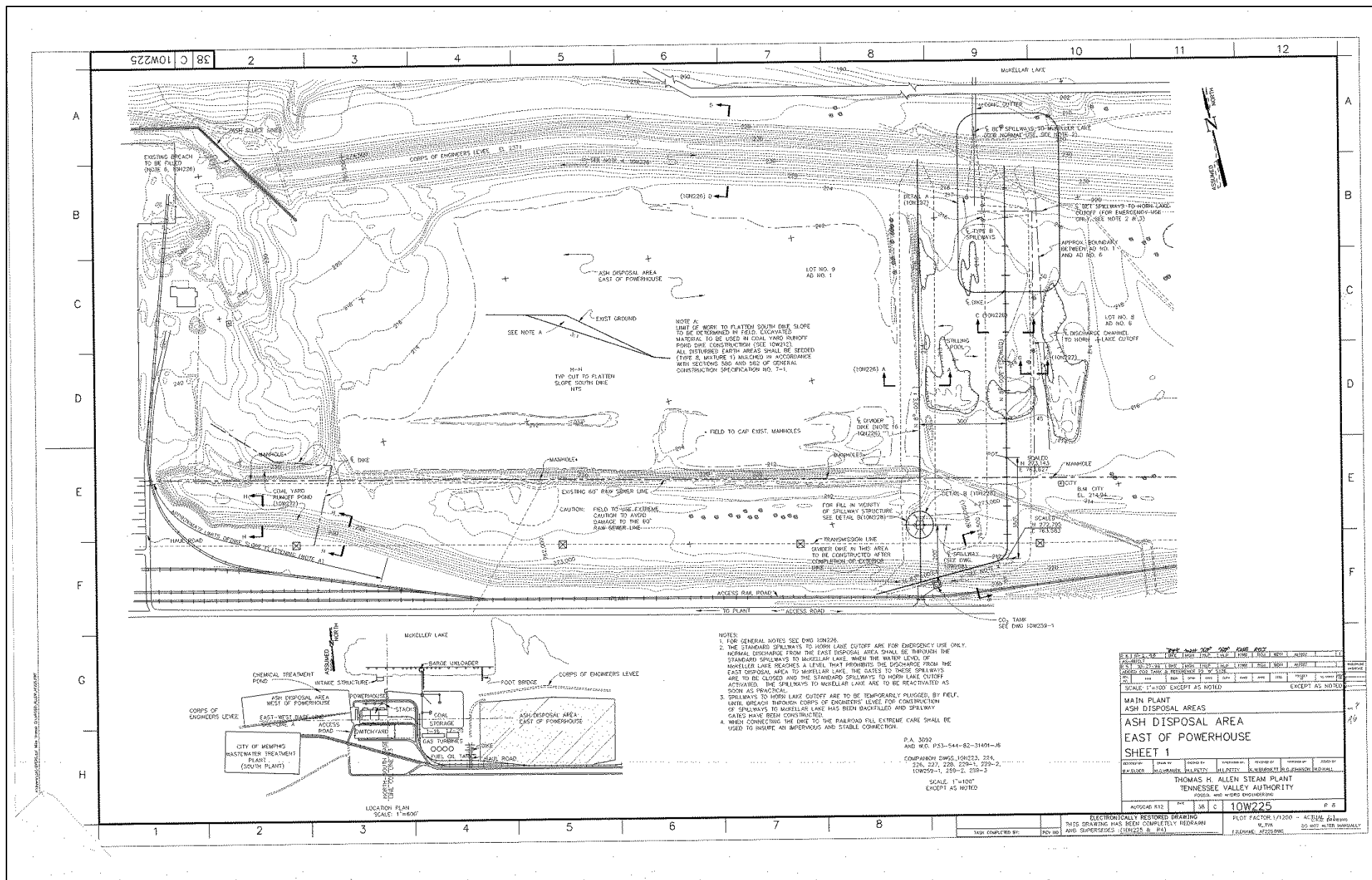


Figure 9. East Ash Impoundment (satellite image from Bing).



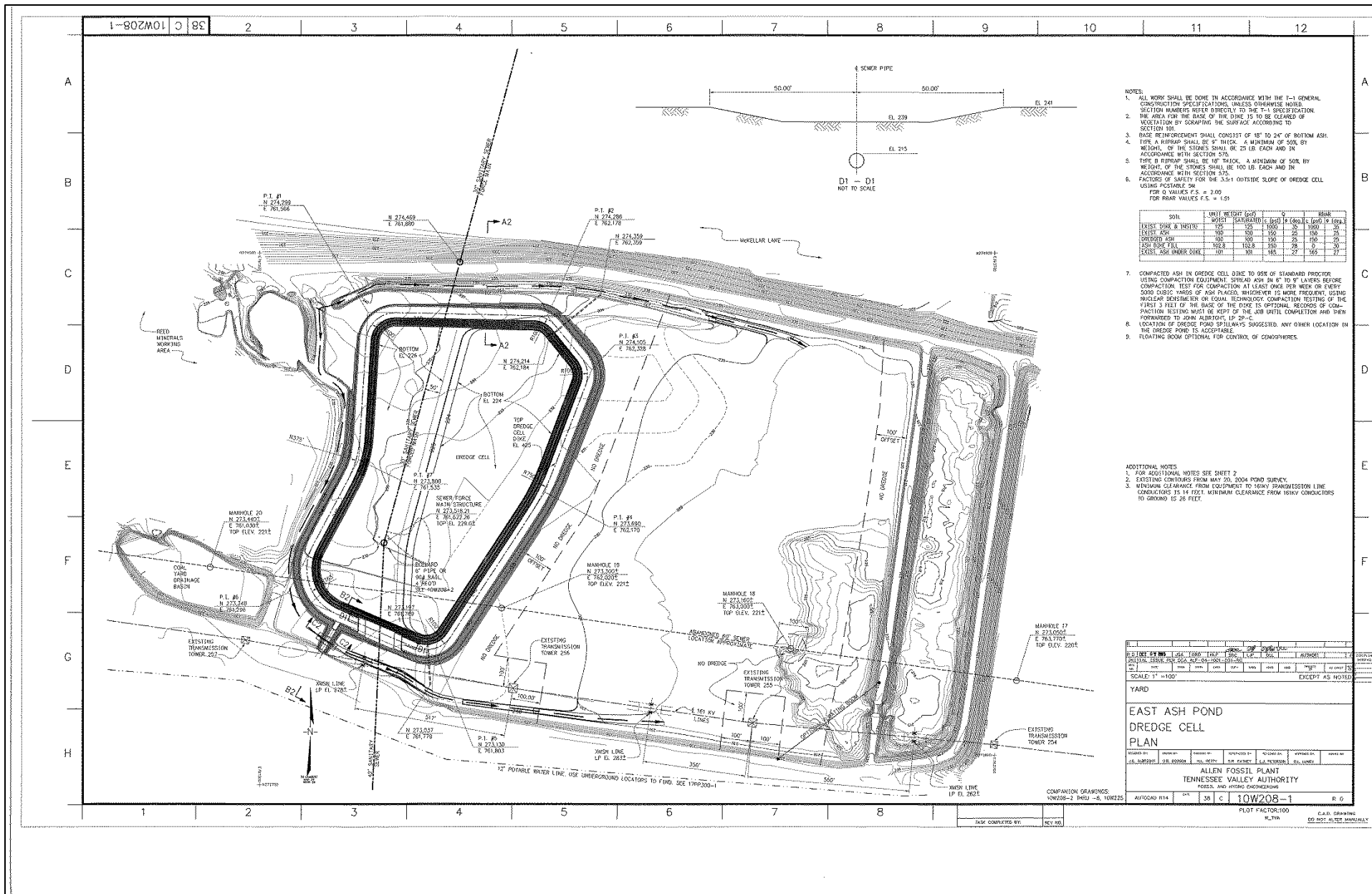


Figure 11. East Ash Impoundment, showing the dredge cell and stilling impoundment. TVA drawing (2005).



TENNESSEE HISTORICAL COMMISSION
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July 7, 2017

Mr. Clinton E. Jones
Tennessee Valley Authority
Biological and Cultural Compliance
400 West Summit Hill Drive
Knoxville, TN 37902

RE: TVA / Tennessee Valley Authority, Allen Fossil Plant, East Ash Impoundment Closure, Shelby County, TN

Dear Mr. Jones:

In response to your request, we have reviewed the documents you submitted regarding your proposed undertaking. Our review of and comment on your proposed undertaking are among the requirements of Section 106 of the National Historic Preservation Act. This Act requires federal agencies or applicant for federal assistance to consult with the appropriate State Historic Preservation Office before they carry out their proposed undertakings. The Advisory Council on Historic Preservation has codified procedures for carrying out Section 106 review in 36 CFR 800 (Federal Register, December 12, 2000, 77698-77739).

After considering the documentation submitted, we concur that there are no National Register of Historic Places listed or eligible properties affected by this undertaking. We have made this determination because either: no National Register listed or eligible Historic Properties exist within the undertaking's area of potential effects, the specific location, size, scope and/or nature of the undertaking and its area of potential effects precluded affects to Historic Properties, the undertaking will not alter any characteristics of an identified eligible or listed Historic Property that qualify the property for listing in the National Register, or it will not alter an eligible Historic Property's location, setting or use. We have no objections to your proceeding with your undertaking.

If your agency proposes any modifications in current project plans or discovers any archaeological remains during the ground disturbance or construction phase, 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. You may direct questions or comments to Jennifer M. Barnett (615) 687-4780. This office appreciates your cooperation.

Sincerely,

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

EPM/jmb



Tennessee Valley Authority, 400 West Summit Hill Drive, Knoxville, TN 37902

October 24, 2018

TO THOSE LISTED:

TENNESSEE VALLEY AUTHORITY (TVA), ALLEN FOSSIL PLANT D4 PROJECT, SHELBY COUNTY, TENNESSEE (35°4'27" M / 90°8'50" W)

TVA proposes to decommission, deactivate, decontaminate, and demolish Allen Fossil Plant (ALF) in Shelby County, Tennessee (Figure 1). TVA has determined that the ALF D4 Project constitutes an undertaking (as defined at 36 CFR § 800.16(y)) that has the potential to cause effects on historic properties. We are initiating consultation under Section 106 of the National Historic Preservation Act for this undertaking.

This project stems from an agreement that the Tennessee Valley Authority (TVA) and the U.S. Environmental Protection Agency (USEPA) entered into in 2011 to resolve a dispute over how the Clean Air Act (CAA)'s New Source Review program applied to maintenance and repair activities at TVA's coal-fired power plants. TVA also entered into a judicial consent decree with four states and three non-governmental organizations. These agreements (collectively the "EPA Clean Air Agreements") require TVA to, among other things, reduce emissions from its coal-fired power plants. Decommissioning and demolishing ALF is one of the options open to TVA under the EPA Clean Air Agreements.

TVA is considering various alternatives for carrying out the ALF D4 Project. The project may involve the closure of Units 1, 2, and 3 and the demolition and deconstruction of the systems and structures that would no longer be needed. These include the coal handling structures (conveyors, crushers, reclaim hoppers), coal yard offices, coal handling assembly room/control room, maintenance building, transformer yard, exhaust stacks, ammonia storage facilities, hydrogen buildings, compressor sheds, yard equipment maintenance building, barge unloader, and mooring cells. TVA may also demolish the powerhouse, administrative office building, electrostatic precipitators, selective catalytic reduction (SCR) systems, maintenance and power stores building, soot-blowing compressor buildings and receiver tank, truck scale, liquid sulfur tanks and boiler room, electrical equipment building, and water treatment building. Systems and facilities necessary for the ALF CT units would remain in place.

TVA has determined that the area of potential effects (APE) for the proposed undertaking, for direct effects, consists of all areas that would be affected by deconstruction or demolition of the above-listed activities (Figure 2). As the project would not include any new construction, TVA does not consider the ALF D4 project to have potential for indirect effects on any above-ground historic structures that may be present in the viewshed. TVA completed a Cultural Resources survey, which included an architectural assessment of ALF, in 2014. TVA recommended that ALF is ineligible for inclusion in the National Register of Historic Places (NRHP) and the Tennessee State Historic Preservation Officer agreed by letter dated July 9, 2014.

The APE has not been included in any previous archaeological survey and no archaeological sites have been identified previously within the APE. Based on current satellite images and various plant drawings, nearly the entirety of the APE is covered with asphalt, concrete, or buildings, making it impossible to investigate using conventional survey techniques. In order to evaluate the potential for intact archaeological sites in the APE, we relied on background information relating to the APE's geology and history of development. Some of this information was presented in a previous consultation concerning the proposed closure of the East Ash Impoundment (our letter dated July 6, 2017).

The underlying geology of the project area likely consists of unconsolidated alluvial silts and sands. Prior to the construction of ALF, the entire APE was within the active floodplain of the Mississippi River. A 1925 U.S. Geological Survey map of the area depicts these areas as "subject to overflow by Mississippi River" (Figure 3). A 2004 U.S. Geological Survey map showing surficial deposits in the area immediately east of the APE (Moore and Diehl 2004; excerpt shown in Figure 4) unfortunately does not extend to the APE. However, this map does include a portion of the former U.S. Army Corps of Engineers "Ash Disposal Easement Area No. 6", which borders the ALF reservation on the east. Geologic units shown on the western extremity of this map show artificial lands that include the berm surrounding the former USACE Ash Disposal Easement Area 6. That area lies within a wide swath of land bordering McKellar Lake on the south that is described as *Qal*, Holocene and late Pleistocene alluvium. This unit is described as "fine - to medium - grained quartz and chert ... sand; 205 percent heavy minerals with green olivine (?) and pyroxene (?). Deposit is unconsolidated, friable, and distinctively planar bedded and cross bedded." The thickness of unit *Qal* is estimated to be 10-35 meters. This description is consistent with an interpretation of a long period of dynamic alluvial activity throughout the late Pleistocene and Holocene, resulting in a thick deposit of frequently re-worked silts and sands with low potential to contain intact archaeological deposits. Rapid changes in alluvial landforms resulting from Mississippi River high flows and floods are well documented throughout the region's history.

Construction of ALF began in 1956, and all three units went into operation in 1959. The powerhouse foundation is a reinforced concrete slab supported by pilings. Construction included extensive grading. An area of 200,000 cubic yards was excavated for the plant; the project required 3,784,116 cubic yards of construction fill and 53,252 cubic yards of concrete (TVA 1968). Additional construction activities have taken place in the past 58 years, including construction of the ash precipitators in 1970 and, later, the addition of a power stores building, a new crusher house, security buildings, sheds, a hazardous materials building, and a dozer garage. Based on past documented disturbance, the probability of intact Holocene soils or sediments, or historic deposits pre-dating ALF construction, remaining in the APE is very low.

Given the geological setting coupled with previous construction activities, TVA finds that no additional archaeological survey is necessary and that the undertaking would have no effects on historic properties.

Pursuant to 36 CFR Part 800.3(f)(2), TVA is consulting with the following federally recognized Indian tribes regarding historic properties within the APE that may be of religious and cultural

Those Listed
Page 3
October 24, 2018

significance and are eligible for the NRHP: Absentee Shawnee Tribe of Oklahoma, Cherokee Nation, The Chickasaw Nation, Choctaw Nation of Oklahoma, Eastern Shawnee Tribe of Oklahoma, Jena Band of Choctaw Indians, Kialegee Tribal Town, Muscogee (Creek) Nation, Shawnee Tribe, Thlopthlocco Tribal Town, and United Keetoowah Band of Cherokee Indians in Oklahoma.

By this letter, TVA is providing notification of these findings and is seeking your comments regarding any properties that may be of religious and cultural significance and may be eligible for listing in the NRHP pursuant to 36CFR § 800.2 (c)(2)(ii), 800.3 (f)(2), and 800.4 (a)(4)(b).

Please respond by November 23, 2018 if you have any comments on the proposed undertaking. If you have any questions, please contact me by phone, (865) 632-2464, or by email, mmshuler@tva.gov.

Sincerely,



Marianne Shuler
Senior Specialist, Archaeologist & Tribal Liaison
Cultural Compliance

SCC:ABM
Enclosures
cc (Enclosures):

REFERENCE CITED

Tennessee Valley Authority (TVA)

1969 *Supplement No. S3 to Engineering Data – TVA Steam Plants. Technical Monograph No. 55 – Volumes 2 & 3. Bull Run Unit 1 (Updated), Thomas H. Allen Units 1-3 (Leased).* Tennessee Valley Authority, Knoxville, Tennessee.

IDENTICAL LETTER MAILED TO THE FOLLOWING ON OCTOBER 24, 2018:

Mr. Brett Barnes
Tribal Historic Preservation Officer
Eastern Shawnee Tribe of Oklahoma
127 West Oneida
Seneca, Missouri 64865

Ms. Sheila Bird
Tribal Historic Preservation Officer
United Keetoowah Band of Cherokee Indians in Oklahoma
Post Office Box 1245
Tahlequah, Oklahoma 74465

cc: Ms. Charlotte Wolfe
United Keetoowah Band of Cherokee Indians in Oklahoma
Post Office Box 1245
Tahlequah, Oklahoma 74465

Ms. Karen Brunso
Tribal Historic Preservation Officer
Division of Historic Preservation
Department of Culture & Humanities
The Chickasaw Nation
Post Office Box 1548
Ada, Oklahoma 74821-1548

Ms. RaeLynn Butler
Manager
Historic & Cultural Preservation Department
Muscogee (Creek) Nation
Post Office Box 580
Okmulgee, Oklahoma 74447

cc: Ms. Corain Lowe-Zepeda
Tribal Historic Preservation Officer
Historic & Cultural Preservation Department
Muscogee (Creek) Nation
Post Office Box 580
Okmulgee, Oklahoma 74447

Mr. Terry Clouthier
Thlopthlocco Tribal Town
Tribal Historic Preservation Officer
Post Office Box 188
Okemah, Oklahoma 74859

Mr. David Cook
Tribal Administrator
Kialegee Tribal Town
Post Office Box 332
Wetumka, Oklahoma 74883

Ms. Suhala Nease
Absentee-Shawnee Tribe of Oklahoma
2025 S. Gordon Cooper Drive
Shawnee, Oklahoma 74801

Mr. Daniel Ragle
Compliance Review Officer
Historic Preservation Department
Choctaw Nation of Oklahoma
Post Office Drawer 1210
Durant, Oklahoma 74702

Ms. Alina J. Shively
Tribal Historic Preservation Officer
Jena Band of Choctaw Indians
Post Office Box 14
Jena, Louisiana 71342

Ms. Tonya Tipton
Shawnee Tribe
Post Office Box 189
Miami, Oklahoma 74355

Ms. Elizabeth Toombs
Cherokee Nation
Post Office Box 948
Tahlequah, Oklahoma 74465

Mr. Stephen Yerka (NHPA)
Tribal Historic Preservation Office
Eastern Band of Cherokee Indians
Post Office Box 455
Cherokee, North Carolina 28719

cc: Mr. Russell Townsend
Tribal Historic Preservation Officer
Eastern Band of Cherokee Indians
Post Office Box 455
Cherokee, North Carolina 28719

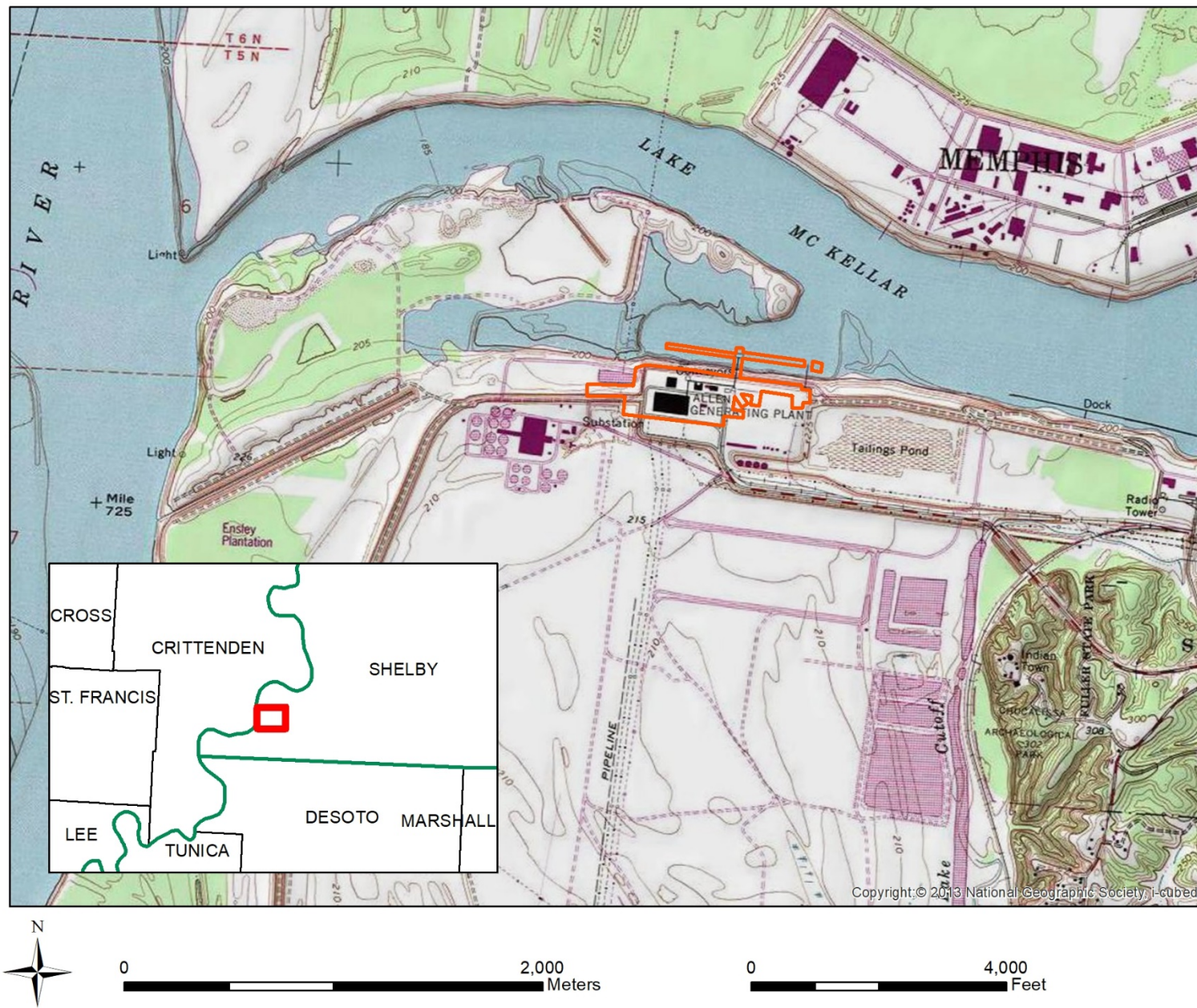


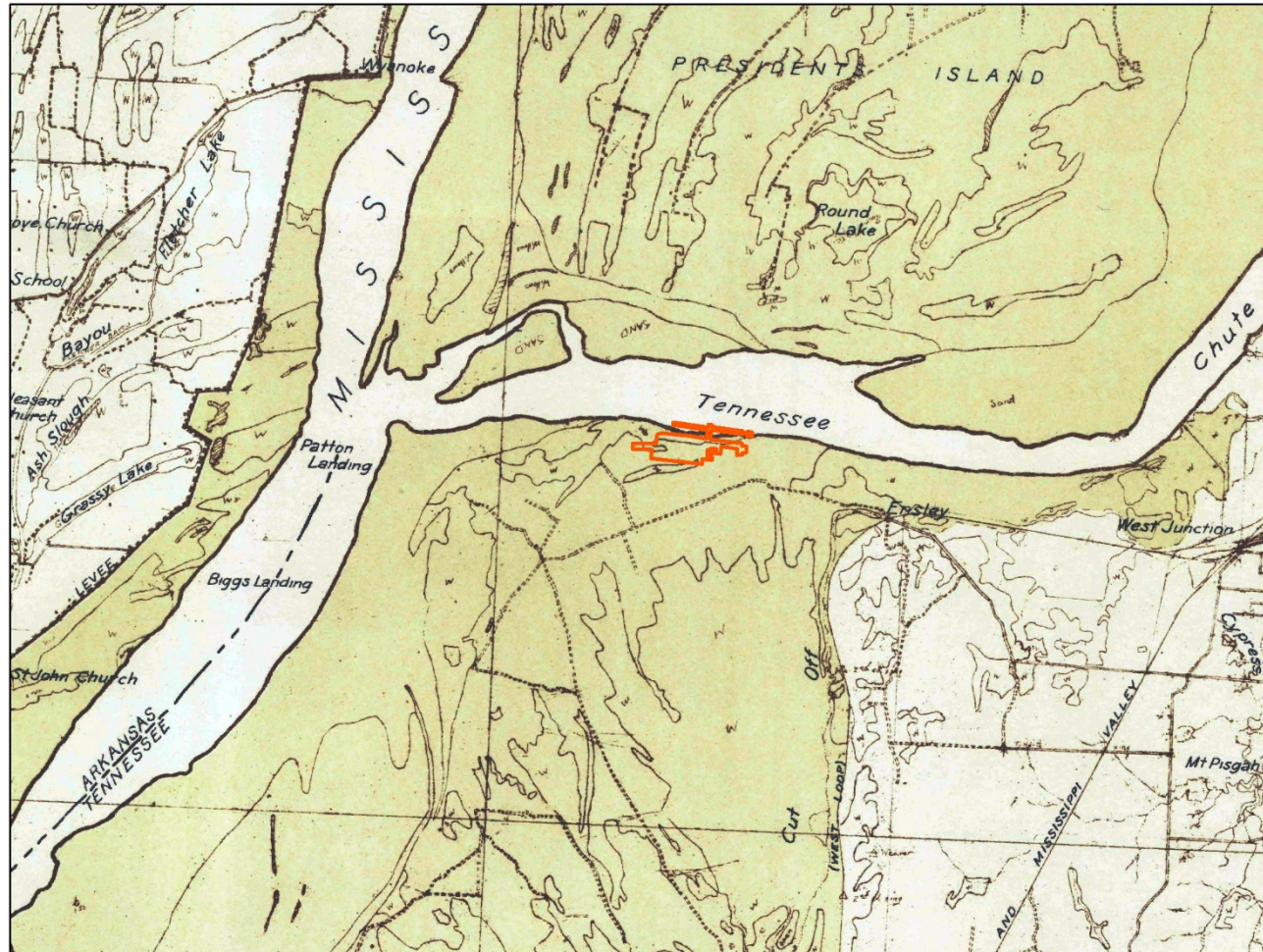
Figure 1. Project location. Base map: USA Topo Maps topographic map based on USGS Fletcher Lake 7.5-minute quadrangle.



0 400 Meters

0 1,000 Feet

Figure 2. ALF D4 Project Area.



0 4 Kilometers

0 2 Miles

Figure 3. Location of project area shown on the 1925 USGS 1:48,000 Southwest Memphis geologic map (excerpt). Shaded areas are “subject to overflow by the Mississippi River”, according to notes on the map.

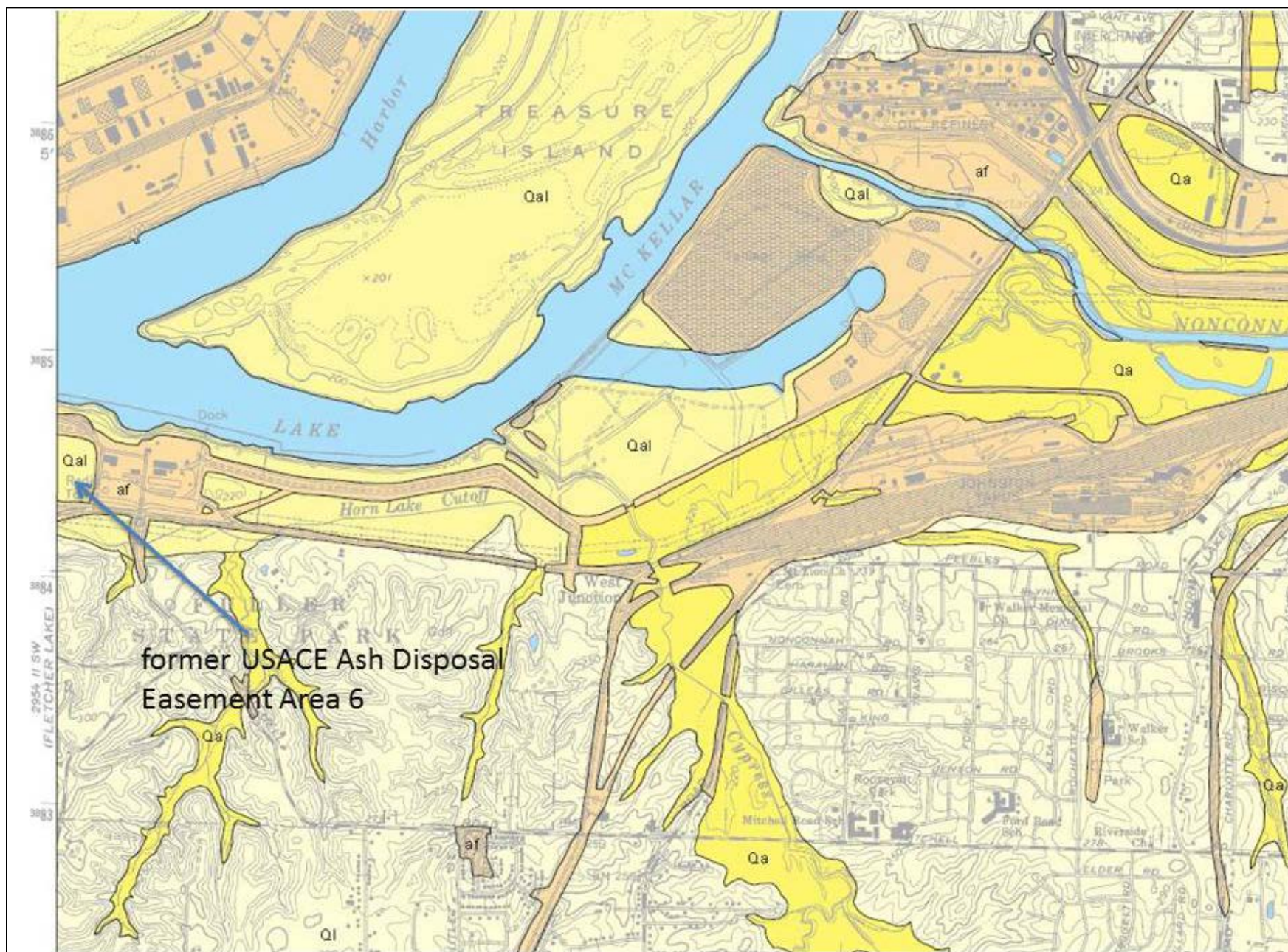


Figure 4. Excerpt from the 2004 USGS "Surficial Geologic Map of the Southwest Memphis Quadrangle, Shelby County Tennessee and Crittenden County, Arkansas." Key to units: Qal, River alluvium (Holocene and late Pleistocene); af, artificial fill (late Holocene); Qa, Creek alluvium (Holocene and late Pleistocene).



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November 1, 2018

Mr. Clinton E. Jones
Tennessee Valley Authority
Biological and Cultural Compliance
400 West Summit Hill Drive
Knoxville, TN 37902

RE: TVA / Tennessee Valley Authority, Allen Fossil Plant D4 Project, Memphis, Shelby County, TN

Dear Mr. Jones:

In response to your request, we have reviewed the archaeological documentation submitted by you regarding the above-referenced undertaking. Our review of and comment on your proposed undertaking are among the requirements of Section 106 of the National Historic Preservation Act. This Act requires federal agencies or applicants for federal assistance to consult with the appropriate State Historic Preservation Office before they carry out their proposed undertakings. The Advisory Council on Historic Preservation has codified procedures for carrying out Section 106 review in 36 CFR 800 (Federal Register, December 12, 2000, 77698-77739).

Considering the information provided, we concur that no archaeological resources eligible for listing in the National Register of Historic Places will be affected by this undertaking. If project plans are changed or archaeological remains are discovered during project 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. Complete and/or updated Tennessee Site Survey Forms should be submitted to the Tennessee Division of Archaeology for all sites recorded and/or revisited during the current investigation. Questions or comments may be directed to Jennifer Barnett (615) 687-4780.

Your cooperation is appreciated.

Sincerely,

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

EPM/jmb



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February 21, 2019

Mr. Clinton E. Jones
Tennessee Valley Authority
Biological and Cultural Compliance
400 West Summit Hill Drive
Knoxville, TN 37902

RE: TVA / Tennessee Valley Authority, Allen Fossil Plant D4 Project, Revised, Memphis, Shelby County, TN

Dear Mr. Jones:

In response to your request, we have reviewed the cultural resources documentation submitted by you regarding the above-referenced undertaking. Our review of and comment on your proposed undertaking are among the requirements of Section 106 of the National Historic Preservation Act. This Act requires federal agencies or applicants for federal assistance to consult with the appropriate State Historic Preservation Office before they carry out their proposed undertakings. The Advisory Council on Historic Preservation has codified procedures for carrying out Section 106 review in 36 CFR 800 (Federal Register, December 12, 2000, 77698-77739).

Considering the information provided, we concur that no historic properties eligible for listing in the National Register of Historic Places will be affected by this undertaking. If project plans are changed or archaeological remains are discovered during project 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. Questions or comments may be directed to Jennifer Barnett (615) 687-4780.

Your cooperation is appreciated.

Sincerely,

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

EPM/jmb