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FINAL SUPPLEMENTAL ENVIRONMENTAL ASSESSMENT

INSTALLATION OF A MECHANICAL GYPSUM DEWATERING SYSTEM AT KINGSTON FOSSIL PLANT

ROANE COUNTY, TENNESSEE

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ACRONYMS, ABBREVIATIONS, AND SYMBOLS

<	Less Than
≤	Less Than or Equal To
$\mu g/m^3$	Micrograms per Cubic Meter
AADT	Average Annual Daily Traffic
APC	Air Pollution Control
BACT	Best Available Control Technology
CAA	Clean Air Act
CAPP	Central Appalachian Province
CCP(s)	Coal Combustion Product(s)
CCW	Condenser Cooling Water
CO	Carbon Monoxide
CFR	Code of Federal Regulations
DOE	United States Department of Energy
DSN	Discharge Serial Number
EA	Environmental Assessment
ES	Effluent Slurry
FGD	Flue Gas Desulfurization
FMCSA	Federal Motor Carrier Safety Administration
GDA	Gypsum Disposal Area
I-	Interstate Highway
KIF	Kingston Fossil Plant
lb	Pound(s)
lb/day	Pounds per Day
LOS	Level of Service
LCS	Leachate Collection System
LSFO	Limestone Forced Oxidation
MGD	Millions of Gallons per Day
mg/L	Milligrams per Liter
mg/m^3	Milligrams per Cubic Meter
mmBtu	Million British Thermal Units
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NESHAP(s)	National Emission Standards for Hazardous Air Pollutant(s)
NO_2	Nitrogen Dioxide
NOx	Nitrogen Oxide
NPDES	National Pollutant Discharge Elimination System
NSPS	New Source Performance Standards
NSR	New Source Review
O_3	Ozone
Pb	Lead
PCBs	Polychlorinated Biphenyls
PM	Particulate Matter
$PM_{2.5}$	Particulate Matter whose particles are less than or equal to 2.5 micrometers
PM_{10}	Particulate Matter whose particles are less than or equal to 10 micrometers
ppb	Parts per Billion
ppm	Parts per Million
PRB	Powder River Basin
PSD	Prevention of Significant Deterioration
RFPs	Request for Proposals
SCR	Selective Catalytic Reduction
SO_2	Sulfur Dioxide
SR	State Route
TDEC	Tennessee Department of Environment and Conservation

TSP	Total Suspended Particulates
TVA	Tennessee Valley Authority
US	United States Highway
USEPA	United States Environmental Protection Agency
USDOT	United States Department of Transportation

CHAPTER 1

1.0 PURPOSE OF AND NEED FOR ACTION

1.1. The Decision

Following the fly ash dike failure at Kingston Fossil Plant (KIF) in December 2008, and the ensuing review, Tennessee Valley Authority (TVA) is planning to convert the future handling of coal combustion products (CCPs) at its fossil plant from wet to dry storage. Kingston is the first plant proposed to be converted from wet gypsum handling to dry gypsum handling under this initiative. In order to achieve this wet to dry conversion for gypsum, TVA is proposing to construct a gypsum dewatering facility as part of the limestone forced oxidation (LSFO) scrubber system at KIF. This document is supplementing the original environmental assessment (EA) for the installation of the scrubbers at KIF *Installation of Flue Gas Desulfurization System on Kingston Fossil Plant Environmental Assessment* (TVA 2006) by evaluating the environmental impact of the installation and operation of a mechanical dewatering system for gypsum at the facility.

KIF is an important source of base load power to TVA in providing and maintaining safe, reliable, and cost-effective electricity for the people of the TVA power service area. This proposal for dry handling of gypsum at KIF would provide TVA with a state-of-the-art, secure storage system that leads the industry in the management of CCPs, as well as allows for future marketing of CCPs not currently feasible under the wet gypsum storage system. The primary decision before TVA is whether to add a mechanical dewatering for gypsum at Kingston. The system would be designed with 100 percent redundancy when the plant is burning coal with 3.1 pounds (lb) of sulfur per million British thermal units (mmBtu). If coals with higher-sulfur concentrations were burned, the redundancy of the system would be lost. The system would be capable of processing approximately 65 tons of gypsum per hour at full load and have the capacity to produce gypsum of marketable quality. The anticipated construction schedule is 13 months. The anticipated date for construction completion is December 2011.

Gypsum production and disposal is now an ongoing activity at KIF. TVA currently holds a solid waste permit (IDL 73-0211) from the Tennessee Department of Environment and Conservation (TDEC) for using a wet stacking method for handling gypsum and a National Pollutant Discharge Elimination System (NPDES) permit (TN 0080870) for discharge of wastewater from the gypsum pond system.

1.2. Site Description and Location

KIF is located in Harriman, Tennessee (Roane County), at the base of a peninsula formed by the Clinch and Emory rivers embayment of Watts Bar Reservoir, north of Interstate Highway (I-) 40, and about 30 miles west of Knoxville, Tennessee. A site locality map (Figure 1-1) provides details of the location and property boundaries. At KIF, TVA operates nine coal-fired boilers, which are fitted with electrostatic precipitators that remove fly ash from the exhaust stream. Selective catalytic reduction (SCR) systems are also in place to reduce nitrogen oxide (NOx) emissions. Two scrubbers have been installed that help control sulfur dioxide (SO_2) emissions from all nine units.

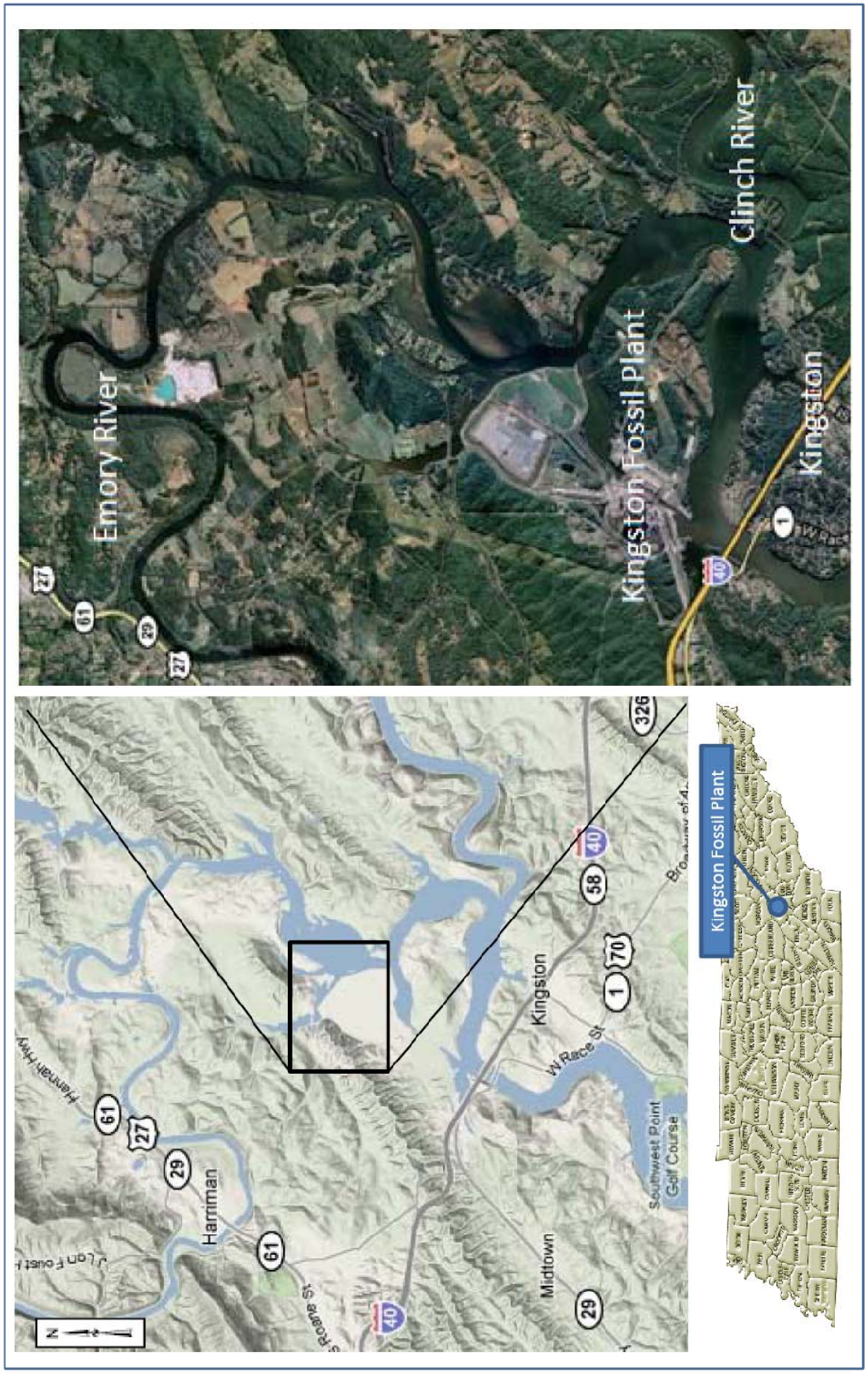

Figure 1-1. Kingston Fossil Plant Locality Map

1.3. Background

In July 2009, the TVA Board of Directors passed a resolution to review and address systems, controls, and standards related to CCPs (fly ash, bottom ash, and gypsum), which result from the burning of coal to produce electricity. TVA has subsequently reviewed its practices for handling and storing CCPs at its generating facilities, including its coal-fired plant at Kingston. An outcome of that review is the current proposal in this EA to mechanically dewater the gypsum produced by the scrubbers rather than use the current gravity dewatering method at the location depicted in Figure 1-2.

TVA began testing of the new scrubbers in June 2010, and the units are expected to be in full operation late this calendar year. TVA received approval from TDEC's Division of Solid Waste Management for a minor modification to TVA's existing solid waste permit at KIF. The modification will add finger drains to the underdrain system in the gypsum disposal area (GDA). TVA is also pursuing plans to lower the final stack height. The addition of the finger drains will reduce the water level in the dry stack. The finger drains, coupled with a lower gypsum stack height, would help improve the overall stability of the stacked gypsum.

1.4. Other Pertinent Environmental Reviews or Documentation

- *Coal Combustion By-Product Marketing Environmental Assessment* (TVA 1990). This EA discussed the environmentally acceptable options for the use and marketing of CCPs produced by TVA.

- *Installation of Flue Gas Desulfurization System on Kingston Fossil Plant Environmental Assessment* (TVA 2006). This EA, hereafter referred to as the KIF scrubber EA, was conducted for the addition of the scrubber and discussed adding dewatering equipment in the same location as it is currently being proposed. At that time of the initial review, however, TVA did not have the details of the proposed system. This EA is being supplemented for the addition of the gypsum dewatering equipment.

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

- *Kingston Dry Fly Ash Conversion Environmental Assessment* (TVA 2010). This EA evaluated the change from wet sluicing of fly ash to add a dry collection system. This is a state of the art system, which will allow for more secure disposal and produce a product capable of being marketed. This EA also evaluated the potential for disposal of fly ash in the Phase II section of the gypsum landfill. Although not part of the scope of this EA, the analysis is included in Section 3.2 of this EA for ease of reference.

1.5. Environmental Assessment Scope and Public Review

Because TVA is a federal agency, the proposed project constitutes a federal action subject to the requirements of the National Environmental Policy Act (NEPA) and TVA's NEPA implementing procedures. Accordingly, TVA has prepared this supplemental EA to evaluate alternatives for converting the current gravity gypsum dewatering systems at KIF to a mechanical dewatered gypsum handling system. This EA will identify and evaluate potential environmental impacts associated with those alternatives; describe any commitments to minimize environmental impacts; and communicate findings to the TVA

decision makers and the public. This EA will be available on TVA's external Web site for public review (http://www.tva.com/environment/reports/index.htm).

1.6. Issues to be Addressed

The existing wet stacking system of dewatering gypsum was analyzed in the KIF scrubber EA (TVA 2006) together with a partial evaluation for the potential addition of a mechanical dewatering system. That EA did not identify a particular design or the operating parameters for the mechanical dewatering system. This EA specifies and evaluates those parameters. The KIF scrubber EA determined that impacts from the proposed system to groundwater, managed areas and ecologically significant sites, visual resources, floodplains, wetlands, natural areas, aquatic ecology, terrestrial ecology, environmental justice, cultural resources, or prime farmlands would be minor or absent. The proposed action would not impact these resources as well. Additionally, there would be no increase in noise with the current proposal as compared to the previous evaluation in TVA 2006, because the dewatering system would be located inside a building. Due to the industrialized and highly disturbed nature of the proposed site, the KIF scrubber EA identified no impacts to federally or state-listed species or to the general terrestrial or aquatic biological communities or habitats, and this information is valid for this review. No production of hazardous waste, waste requiring special handling and storage, or negative social or socioeconomic impacts are anticipated from this proposed project. The currently proposed project would not conflict with any plan, existing land use, or zoning regulation.

This supplemental EA addresses impacts to the following resources:

- Air
- Water
- Solid Waste
- Transportation

1.7. Necessary Federal Permits or Licenses

The proposed action would be subject to the following environmental permit requirements and regulations.

- Air permitting regulations under the Clean Air Act (CAA) would require the project to secure an air construction permit prior to the start of new facility construction.

- The KIF Solid Waste Permit No. IDL 73-0211 would need a modification to reflect a change in the manner in which the gypsum is handled in the disposal area.

- The project would also require modifications to the Title V Permit under the CAA.

- A Storm Water Construction Permit under the Clean Water Act would be required by the TDEC prior to commencement of construction.

- The scope of NPDES Permit No. 0080870 would need to be evaluated for the need to request a modification to the permit in order to accommodate operation of the gypsum dewatering system.

Figure 1-2. Kingston Fossil Plant Gypsum Dewatering Facility Overview

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CHAPTER 2

2.0 ALTERNATIVES INCLUDING THE PROPOSED ACTION

2.1. Alternatives

This EA documents the evaluation of two reasonable alternatives: the No Action and Action Alternatives. The No Action Alternative would be the continued use of the currently permitted gravity dewatering system, and the Action Alternative would involve adding a mechanical dewatering handling system.

2.1.1. Alternative A – The No Action Alternative

Under the No Action Alternative, TVA would continue the use of the wet gypsum gravity dewatering and handling system and the use of existing impoundments as are currently permitted. The gypsum being generated from the operation of KIF would continue to be collected along the rim inside the GDA from the sluice line and be removed with a track hoe to a gravity dewatering area prior to stacking the gypsum for disposal. The rim would follow the stacking operation as the elevation of the gypsum in the GDA increased until the Phase I area was full and ready for final closure which would be approximately eight years burning 3.1 lb of sulfur coal at full load.

2.1.2. Alternative B – Action Alternative – Addition of Gypsum Dewatering System

Under the Action Alternative, TVA would not operate the GDA as proposed in the scrubber EA for KIF unless the mechanical dewatering system is temporarily offline. The current process for removing the effluent slurry from the scrubber is to send the effluent slurry directly to the GDA for settling and gravity dewatering prior to stacking the gypsum. This type of operation is typically referred to as wet stacking. TVA is now proposing to install a mechanical gypsum dewatering system (Figure 2-1) and to provide a transfer point for on-site gypsum disposal (i.e., the GDA) and off-site gypsum sales. The system would include a gypsum dewatering plant with the capacity to dry the gypsum to 15 percent moisture by weight and supplementary handling processes.

The addition and layout of the new equipment would be as depicted in Figure 2-1.

The proposed gypsum dewatering plant would consist of two horizontal vacuum belt filter and hydrocyclone trains and be designed to be retrofitted to produce marketable grade gypsum in the future. Effluent slurry (ES) from the main flue gas desulfurization (FGD) area would be directed to a slurry tank at the dewatering plant. The ES would then feed from the tank to the hydrocyclones, which would remove about 50 percent of the water from the ES. The underflow from the hydrocyclones would go to the vacuum belt filter(s) where the speed of the belt would control the thickness of the dewatered filter cake. Vacuum pumps connected to the vacuum belt filter would remove the moisture (filtrate) from the ES for a dewatered cake moisture content of approximately 15 percent. The overflow from the hydrocyclones would go to a thickener/clarifier. The underflow from the clarifier would be returned to the belt filter, and the overflow would be sent to a storage tank and ultimately to the GDA. The discharge from the dewatering system would have no more than 0.2 percent solids by weight. The storage tank would also provide 60,000 gallons of water required for fire protection of the dewatering facility.

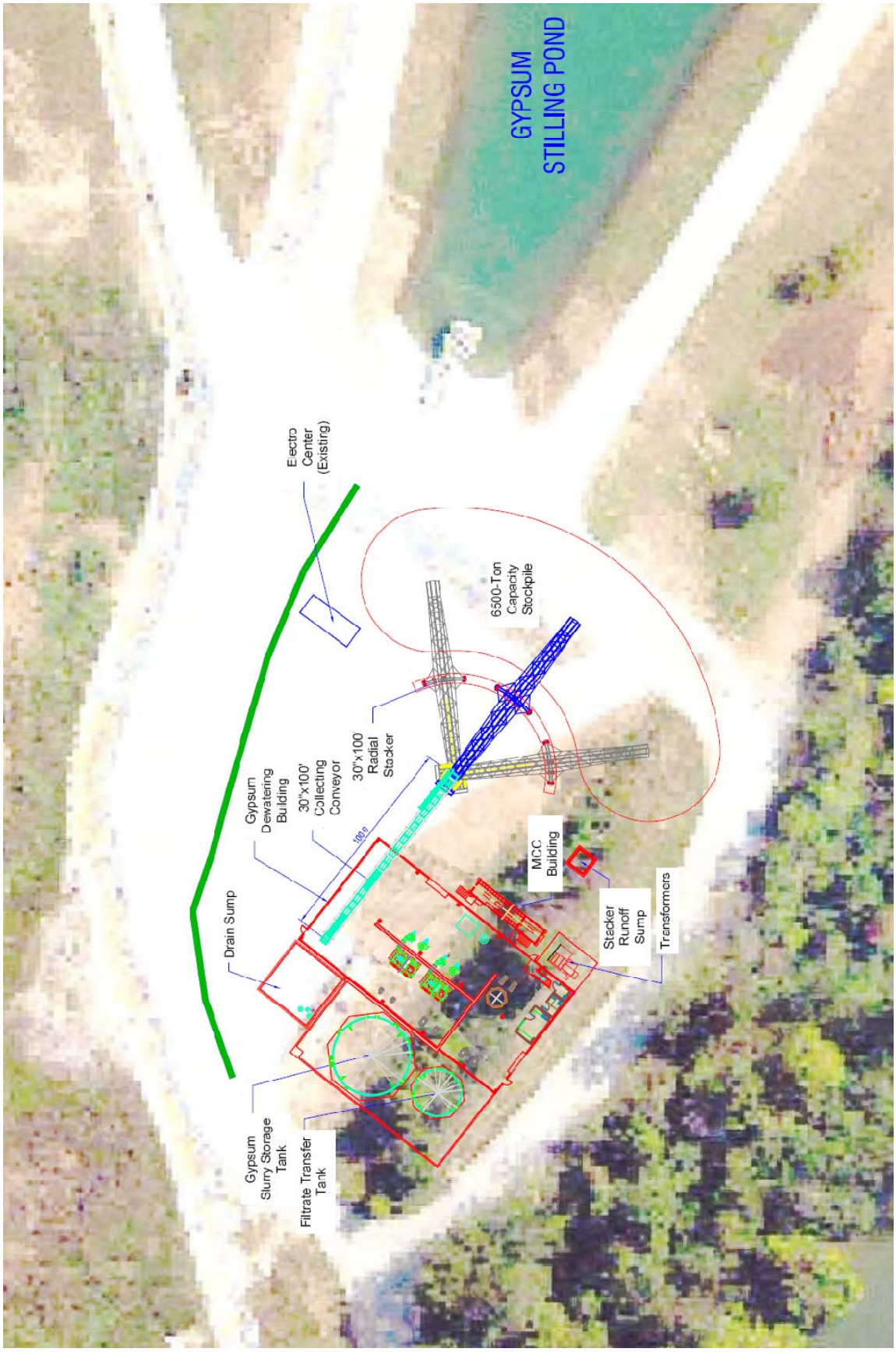

Figure 2-1. Project Equipment to be Installed

A vacuum belt filter consists of two belts: a main, cleated drainage belt and a porous cloth belt, which resides on top of the main belt. The water (filtrate) from the ES would be drawn through the cloth belt leaving the dewatered cake on top. The filtrate removed from the ES would be drawn through the cloth and main belts to the vacuum receiver by the vacuum pump. From the vacuum receiver, the filtrate would be pumped to the thickener/clarifier. The dewatered cake would remain on the cloth belt and would be discharged into chutes located at the end of the vacuum belt onto a gypsum transfer conveyor. The gypsum transfer conveyor would move the cake to an area where it would either be stacked for loading and transported to the GDA by mobile equipment, or if it has been sold, it would be loaded into trucks and transported off site. As the main and cloth belts roll over the end of the vacuum filter, they would be temporarily separated and washed to remove any cake solids that still adhered to the belts. The wash water for the belts would come from the vacuum pump seal water. The spent seal water would then be sent to a wash tank and pumped to the wash nozzles on the vacuum belt filter.

The wash water from the vacuum belt filters would fall to the floor below the filters, which would be sloped to the trench. The area wash down, gypsum conveyor wash down, and equipment drains would be routed to a trench that would feed the building sump. Once the sump has reached its high operating level, the contents would be pumped to the thickener/clarifier.

The gravity dewatering system would remain in place after the dewatering facility is in operation to allow for an emergency bypass in the event the mechanical dewatering facility is not in operation. Because of this capability, the dewatering facility would have limited redundancy based on the type of coal being utilized by KIF. When burning the blended lower-sulfur coal and the 3.1 lb sulfur per mmBtu coal, only one train would be required. Coals burned with the higher 5.0 lb sulfur per mmBtu content would require both vacuum filter trains to operate. The ability to bypass the effluent slurry to the GDA is the reasoning for not requiring additional vacuum belt and material handling redundancy.

There would be sump(s) for collection of rain runoff from the gypsum stock-out pile and transfer conveyor wash down that would eventually be pumped to the GDA.

2.2. Comparison of Alternatives

Table 2-1 compares the environmental consequences of the No Action and the Action Alternatives. The No Action Alternative would be a continuation of the current operation. The Action Alternative would involve converting the wet handling system to a dewatered gypsum handling system and the subsequent operation of the new system including the GDA.

Table 2-1. Comparison of the Environmental Consequences of the No Action and Action Alternatives

Issue Area	No Action Alternative	Proposed Action Alternative
Air Resources	None	The air quality impact of construction-related activities for the project would be minor. Operation of the proposed dewatering system and disposal operations would comply with the State of Tennessee process regulations and fugitive dust regulations and would have total particulate matter emissions below significant emission levels.
Water Resources	Discharge to the GDA would contain 30 percent solids.	Discharge to the GDA would contain 0.2 percent solids, a smaller fraction of solids compared to the flow into the GDA from the existing system. The eventual discharge of the FGD wastewater through the condenser cooling water channel would not adversely impact water quality.
Solid Waste	None	No change in volume of gypsum handling.
Transportation	None	No drops expected in the level of service for the common route to I-40, which is Swan Pond Road to U.S. Highway 70 and then to Pine Ridge Road. Any additional accidents from increased truck traffic would be insignificant.

2.3. The Preferred Alternative

Alternative B, i.e., the Action Alternative - Addition of Gypsum Dewatering System, is TVA's preferred alternative. TVA would convert the wet gypsum handling operation to a mechanically dewatered gypsum handling operation.

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

- During construction, emissions from open construction areas and unpaved roads would be mitigated by spraying water on the roadways, as needed, to reduce fugitive dust emissions.

- During operation of the system, wet suppression of GDA and the paved/unpaved roads would be implemented.

- TVA would conduct an operational characterization of the waters of the GDA to confirm no significant impacts to the Clinch River. The waters would be analyzed for metals and other parameters. If determined to be necessary, appropriate mitigating measures would be evaluated and implemented to ensure that the discharge NPDES permit requirements for the water quality parameters are met.

- Portable toilets would be provided for the additional construction workers as needed. These toilets would be regularly pumped out and the sewage transported by tanker truck to a publicly owned treatment works accepting pump out.

- Although the impacts of the trucks transporting ash materials would be minor on the transportation network, TVA's request for proposals (RFPs) would require potential bidders to use appropriate measures for reducing the potential impact of their KIF trucking activities upon the environment. The contractor would be required to take into account such factors as air pollution, erosion control, noise control, solid waste disposal, and wastewater disposal. Truck owners would be required to maintain trucks properly, including tune-ups, which improve fuel efficiency. Truck routes would avoid schools, historic districts, and downtown areas to the extent possible. Additional requirements such as the use of ultra-low sulfur diesel fuel and the minimizing of vehicle idling time would also be required.

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CHAPTER 3

3.0 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

3.1. Air Resources

3.1.1. Affected Environment

The KIF gypsum dewatering facility would be subject to both federal and State of Tennessee air quality regulations. These regulations impose permitting requirements and specific standards for expected air emissions. The standards and regulations that pertain to the proposed facility include:

- State of Tennessee Process and Fugitive Dust Regulation, TDEC Air Pollution Control (APC); Chapter 1200-3-8, "Fugitive Dust" (TDEC 2001)

- Review for applicability of Prevention of Significant Deterioration (PSD) regulations (40 Code of Federal Regulations [CFR] Part 52.21, United States Environmental Protection Agency [USEPA] 2010).

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

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

The primary NAAQS were promulgated to protect the public health, and the secondary NAAQS were promulgated to protect the public welfare from any known or anticipated adverse effects associated with the presence of pollutants in the ambient air. Areas in violation of the NAAQS are designated as nonattainment areas, and new sources to be located in or near these areas may be subject to more stringent air permitting requirements. A listing of the NAAQS is presented in Table 3-1. National standards, other than annual standards, are not to be exceeded more than once per year (except where noted).

The feasibility of operating a gypsum dewatering system at the given site may be affected by several air quality considerations. One of the factors is regulatory status or attainment of air quality standards. Air emission sources locating in clean air areas are subject to the PSD New Source Review (NSR) rules, whereas those locating in or affecting areas failing to attain air quality standards must comply with nonattainment NSR. An overriding constraint in either NSR program is that no source may cause or significantly contribute to a violation of an ambient air quality standard.

Table 3-1. National Ambient Air Quality Standards

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

Source: 40 CFR Part 50 (USEPA 2008)

Abbreviations: ppb = parts per billion; ppm = parts per million; mg/m^3 = milligrams per cubic meter; µg/m^3 = micrograms per cubic meter

(1) Not to be exceeded more than once per year.

(2) Final rule signed October 15, 2008.

(3) The official level of the annual NO_2 standard is 0.053 ppm, equal to 53 ppb, which is shown here for the purpose of clearer comparison to the 1-hour standard.

(4) To attain this standard, the 3-year average of the 98th percentile of the daily maximum 1-hour average at each monitor within an area must not exceed 100 ppb (effective January 22, 2010).

(5) Not to be exceeded more than once per year on average over 3 years.

(6) To attain this standard, the 3-year average of the weighted annual mean $PM_{2.5}$ concentrations from single or multiple community-oriented monitors must not exceed 15.0 µg/m^3.

(7) To attain this standard, the 3-year average of the 98th percentile of 24-hour concentrations at each population-oriented monitor within an area must not exceed 35 µg/m^3 (effective December 17, 2006).

(8) To attain this standard, the 3-year average of the fourth-highest daily maximum 8-hour average ozone concentrations measured at each monitor within an area over each year must not exceed 0.075 ppm (effective May 27, 2008).

(9) (a) To attain this standard, the 3-year average of the fourth-highest daily maximum 8-hour average ozone concentrations measured at each monitor within an area over each year must not exceed 0.08 ppm.
(b) The 1997 standard—and the implementation rules for that standard—will remain in place for implementation purposes as USEPA undertakes rulemaking to address the transition from the 1997 ozone standard to the 2008 ozone standard.
(c) USEPA is in the process of reconsidering these standards (set in March 2008).

(10) (a) USEPA revoked the 1-hour ozone standard in all areas, although some areas have continuing obligations under that standard ("anti-backsliding").
(b) The standard is attained when the expected number of days per calendar year with maximum hourly average concentrations above 0.12 ppm is $\leq$ 1.

(11) Final rule signed June 2, 2010. To attain this standard, the 3-year average of the 99th percentile of the daily maximum 1-hour average at each monitor within an area must not exceed 75 ppb.

The proposed KIF project is subject to nonattainment NSR analysis since the site is located in a nonattainment area for the 24-hour $PM_{2.5}$ Standard. However, the emission increases associated with the proposed project are not significant, and the project is considered minor under state air quality regulations (TDEC APC 1200-03-09-.01(5)(b)(2), TDEC 2009a). The TDEC APC regulations require new and modified minor stationary sources located within nonattainment areas to apply and meet best available control technology (BACT) to each nonattainment pollutant resulting from each emission unit.

BACT is essentially an emission limitation based on the optimum degree of reduction for each pollutant, on a case-by-case basis, taking into account technical feasibility, energy, environmental, and economic impacts. In no event can the application of BACT result in the emission of any pollutant that would exceed the emissions allowed by applicable New Source Performance Standards (NSPS) or National Emissions Standards for Hazardous Air Pollutants (NESHAPs). BACT is defined in the CAA to be delineated as a numerical emission limit based on the application of air pollution control equipment reductions, specific production processes, methods, systems or techniques, or fuel cleaning or combustion techniques.

Ambient air quality data are available for the KIF site. Based on these data, the air quality in the vicinity of the Kingston plant site is generally good. Table 3-2 shows the results of ambient air quality monitoring of criteria pollutants that are considered representative of the site. USEPA has designated Roane County as partial county nonattainment for $PM_{2.5}$. Nearby Anderson, Knox, and Loudon counties are all nonattainment for $PM_{2.5}$. Roane County is currently in attainment for all other criteria pollutants.

Table 3-2. Ambient Concentrations of Criteria Air Pollutants Compared With Air Quality Standards

Pollutant	Level of Standard	One-Year Maximum or Mean	
		Concentration	Percent of Standard
Sulfur Dioxide	Maximum 3-hour average (0.5 ppm)	0.094 ppm [(a)]	19
	Maximum 24-hour average (0.14 ppm)	0.025 ppm [(a)]	18
	Annual mean (0.030 ppm)	0.002 ppm [(a)]	6
Ozone (New Standard)	4th Highest 8-hour average (0.075 ppm)	0.073 ppm [(b)]	97
Nitrogen Dioxide	Annual mean (0.053 ppm)	0.007 ppm [(c)]	13
Carbon Monoxide	Maximum 1-hour average (35 ppm)	0.9 ppm [(d)]	3
	Maximum 8-hour average (9 ppm)	0.5 ppm [(d)]	6
PM_{10} (Old Standard)	Maximum 24-hour average (150 $\mu g/m^3$)	47 $\mu g/m^3$ [(e)]	31
$PM_{2.5}$ (New Standard)	Annual average (15 $\mu g/m^3$)	13.7 $\mu g/m^3$ [(f)]	91
	24-hour average (35 $\mu g/m^3$)	30.3 $\mu g/m^3$ [(f)]	87
Lead	Quarterly mean (1.5 $\mu g/m^3$)	0.06 $\mu g/m^3$ [(g)]	4

Source: 40 CFR Part 50 (USEPA 2008)
Abbreviations: ppm = parts per million; $\mu g/m^3$ = micrograms per cubic meter
[(a)] Sulfur dioxide values for Bull Run, Anderson County, Tennessee, 2006
[(b)] Ozone values for Oak Ridge, Anderson County, Tennessee, 2008
[(c)] Nitrogen dioxide values for Meigs County, Tennessee, 2006
[(d)] Carbon monoxide values for Look Rock, Blount County, Tennessee, 2007
[(e)] PM_{10} values for Rockwood, Roane County, Tennessee, 2008
[(f)] $PM_{2.5}$ values for Harriman, Roane County, Tennessee, 2008
[(g)] Lead value for Knox County, Tennessee, 2008

All areas in Tennessee attained the old 1-hour ozone standard. However, for some areas, attainment of an 8-hour ozone standard of 0.08 parts per million (ppm) has been more difficult to achieve. Subsequently on March 27, 2008, USEPA revised the primary and secondary NAAQS for ozone (40 CFR Part 50). The level of the 8-hour primary standard was revised to 0.075 ppm, and the secondary standard was revised to equal the revised primary standard.

3.1.2. Environmental Consequences

3.1.2.1. No Action Alternative

Under the No Action Alternative, TVA would continue to operate the GDA using the gravity dewatering method. With this system, the gypsum is sluiced to a pond area for gravity dewatering. The gypsum in the dewatering pond resembles sand in its particle-size distribution, and therefore does not result in significant wind-erosion fugitive dust emissions. The No Action Alternative would not result in significant adverse air quality impacts.

3.1.2.2. Action Alternative

Impacts of Construction

Transient air pollutant emissions would occur during the construction phase. Construction-related air quality impacts are primarily related to land clearing, site preparation, and the operation of internal combustion engines.

Land clearing, site preparation, and vehicular traffic over paved and unpaved roads at the construction site result in the emission of fugitive dust particulate matter (PM) during site preparation and active construction periods. The largest fraction (greater than 95 percent by weight) of fugitive dust emissions would be deposited within the construction site boundaries (Buoicore and Davis 1992). The remaining fraction of the dust would be subject to transport beyond the property boundary. If necessary, emissions from open construction areas and paved/unpaved roads could be mitigated by spraying water on the roadways as needed to reduce fugitive dust emissions.

Combustion of gasoline and diesel fuels by internal combustion engines (vehicles, generators, construction equipment, etc.) would generate local emissions of PM, NOx, CO, volatile organic compounds, and SO_2 during the site preparation and construction period. The total amount of these emissions would be small and would result in minimal off-site impacts.

Air quality impacts from construction activities would be temporary, and dependent on both man-made factors (e.g., intensity of activity, control measures, etc.) and natural factors (e.g., wind speed, wind direction, soil moisture, etc.). However, even under unusually adverse conditions, these emissions would have, at most, a minor transient impact on off-site air quality and would be well below the applicable ambient air quality standard. Overall, the air quality impact of construction-related activities for the project would be minor.

Impacts of Operation

Based on the estimates provided in Table 3-3, the project would be in compliance with the State of Tennessee process regulations[1] and fugitive dust regulations[2] and would have total PM emissions below significant emission levels. Summaries of the proposed emission limits and the applicable emission standards are provided in Table 3-3.

Table 3-3. Potential Particulate Emissions From the KIF Gypsum Dewatering System

Source	Emission Unit Component	Uncontrolled			Controls	Controlled	
		PM	lb/hour	ton/year		lb/hour	ton/year
Transfer Conveyor and Temporary Stacking Area	Gypsum Loadout from Transfer Conveyor	TSP	1.15E-02	5.05E-02	None	1.15E-02	5.05E-02
		PM_{10}	5.45E-03	2.39E-02		5.45E-03	2.39E-02
		$PM_{2.5}$	8.25E-04	3.62E-03		8.25E-04	3.62E-03
	Temporary Stacking Area	TSP	1.98E-02	8.69E-02	None	1.98E-02	8.69E-02
		PM_{10}	1.98E-02	8.69E-02		1.98E-02	8.69E-02
		$PM_{2.5}$	1.98E-02	8.69E-02		1.98E-02	8.69E-02
Gypsum Loadout and Hauling	Gypsum Loadout from Temporary Stacking Area to Trucks	TSP	8.97E-02	4.48E-02	None	8.97E-02	4.48E-02
		PM_{10}	4.24E-02	2.12E-02		4.24E-02	2.12E-02
		$PM_{2.5}$	6.42E-03	3.21E-03		6.42E-03	3.21E-03
	Truck Hauling to GDA	TSP	43.1	189	Wet Suppression	2.16	9.44
		PM_{10}	13.2	57.8		0.660	2.89
		$PM_{2.5}$	1.32	5.78		0.0660	0.289
	Watering Truck Unpaved Road to GDA	TSP	77.0	16.0	Wet Suppression	3.85	0.800
		PM_{10}	23.6	4.90		1.18	0.245
		$PM_{2.5}$	2.36	0.490		0.118	0.0245
Truck Unloading and GDA	Gypsum Unloading from Trucks	TSP	1.02E-02	4.48E-02	None	1.02E-02	4.48E-02
		PM_{10}	4.84E-03	1.11E-03		4.84E-03	1.11E-03
		$PM_{2.5}$	7.33E-04	3.21E-03		7.33E-04	3.21E-03
	Pile Maintenance Spreading (Dozer)	TSP	221	66.4	Wet Suppression	11.1	3.32
		PM_{10}	67.7	20.3		3.39	1.02
		$PM_{2.5}$	6.77	2.03		0.339	0.102
	Pile Watering - Watering Truck	TSP	386	80.2	Wet Suppression	19.3	4.01
		PM_{10}	118	24.6		5.90	1.23
		$PM_{2.5}$	11.8	2.46		0.590	0.123
	GDA	TSP	0.383	1.68	None	0.383	1.68
		PM_{10}	0.383	1.68		0.383	1.68
		$PM_{2.5}$	0.383	1.68		0.383	1.68
Gypsum Sales	Truck Hauling Off-Site Unpaved Roads	TSP	1.80	7.87	Wet Suppression	0.0898	0.393
		PM_{10}	0.550	2.41		0.0275	0.120
		$PM_{2.5}$	0.055	0.241		0.00275	0.0120
	Watering Truck Unpaved Road	TSP	77.0	16.0	Wet Suppression	3.85	0.800
		PM_{10}	23.6	4.90		1.18	0.245
		$PM_{2.5}$	2.36	0.4901		0.118	0.0245
	Truck Hauling Off-Site Paved Road	TSP	16.3	71.4	Wet Suppression	0.815	3.57
		PM_{10}	3.18	13.9		0.159	0.696
		$PM_{2.5}$	0.477	2.09		0.0238	0.104
	Watering Truck Paved Road	TSP	53.4	11.1	Wet Suppression	2.67	0.556
		PM_{10}	10.4	2.17		0.521	0.108
		$PM_{2.5}$	1.56	0.325		0.0780	0.0162
Total Emissions					**TSP**	**44.3**	**24.8**
					PM_{10}	**13.5**	**8.36**
					$PM_{2.5}$	**1.75**	**2.47**

Abbreviations: GDA = Gypsum disposal area
$PM_{2.5}$ = Particulate matter whose particles are less than or equal to 2.5 micrometers
PM_{10} = Particulate matter whose particles are less than or equal to 10 micrometers
TSP = Total suspended particulates

[1] Tennessee Department of Environment and Conservation (TDEC), Division of Air Pollution Control (APC); Chapter 1200-03-07, "Process Emissions Standards" (TDEC 2009b)
[2] TDEC APC; Chapter 1200-03-08, "Fugitive Dust" (TDEC 2001)

Operations of the gypsum dewatering system are subject to specific State of Tennessee process regulations and fugitive dust regulations. Operations are also subject to review for applicability of the PSD regulations for PM_{10} and total particulate. Since the emissions of PM_{10} and total particulate are below PSD significance levels, PSD does not apply to this project. Because the proposed project is located in a nonattainment area for $PM_{2.5}$, it is subject to nonattainment NSR analysis. Since the $PM_{2.5}$ emissions increase associated with the proposed gypsum dewatering system is not significant, the project would be considered a minor modification. The State of Tennessee requires new and modified minor stationary sources located within nonattainment areas to apply and meet BACT limitations. For the gypsum dewatering plant, the BACT would be water suppression on gypsum hauling roads and gypsum stacking areas (see Table 3-3 for proposed BACT emission rates); with this commitment, impacts would be minor.

Sources

All sources of air emissions for the proposed gypsum dewatering system at KIF are listed in Table 3-4.

Table 3-4. Emission Sources From Gypsum Dewatering System

Emission Sources
Transfer Conveyor and Temporary Stacking Area
Gypsum Loadout and Hauling
Truck Unloading and GDA
Gypsum Sales

Fugitive Dust

Fugitive emissions generated by the proposed gypsum transferring and stacking must meet the TDEC APC standards for fugitive dust. These standards state that for fugitive dust sources, visible emissions cannot pass beyond the property more than five minutes per hour or 20 minutes per day. To ensure compliance, wet suppression of GDA and pile and paved/unpaved roads would be implemented. With this commitment, operation of the gypsum dewatering system is not expected to exceed the TDEC standard, and impacts would be minor.

Process Emissions

The gypsum dewatering system would be required to meet TDEC APC process emission standards for PM. All air emissions generated would be fugitive. Equipment utilized at the gypsum dewatering facility would remove water from the gypsum; therefore, there are no quantifiable emissions associated with the operations of the hydrocyclones and the two vacuum belt filters.

Conclusions

Table 3-5 provides a comparison between the emissions presented in Table 3-3 and the applicable significance thresholds. The emission increases that would result from the proposed project indicate that the pollutants would not exceed significance levels and would be considered minor; therefore, nonattainment analysis for major sources (i.e., lowest achievable emission rate) is not required.

Table 3-5. Gypsum Dewatering System Emissions and PSD Limits

Pollutant	Emissions Rate (tons/year)	PSD Threshold (tons/year)
TSP	24.8	25
PM_{10}	8.36	15
$PM_{2.5}$	2.47	10

Abbreviations:
$PM_{2.5}$= Particulate matter whose particles are less than or equal to 2.5 micrometers
PM_{10} = Particulate matter whose particles are less than or equal to 10 micrometers
TSP = Total suspended particulates

TVA has provided analyses demonstrating compliance with all Federal and State of Tennessee requirements for air quality protection. An Application for Air Pollution Control Permit to Construct would be completed and submitted to TDEC.

3.2. Water Resources

3.2.1. Affected Environment

Water resources in the vicinity of KIF have been previously described in recent environmental assessments, including the following:

- *Installation of Flue Gas Desulfurization System at Kingston Fossil Plant Final Environmental Assessment,* TVA, April 2006
- *Emergency Dredging for the Kingston Fossil Plant Ash Dike Failure Final Environmental Assessment*, TVA, March 2009
- *Kingston Dry Fly Ash Conversion Final Environmental Assessment*, TVA, June 2010

Those detailed descriptions are incorporated by reference, and only the information relevant to the proposed project is summarized herein. The readers will note some differences in the values in this assessment versus the previous EAs. These differences are attributed to the collection and analysis of new water quality data.

River flow rates past KIF are regulated by upstream dams on the Clinch River (Melton Hill and Norris dams) and downstream on the Tennessee River (Watts Bar Dam). The flow rates are also influenced by upstream dam operations on the Tennessee River (Tellico and Fort Loudoun dams).

Flow patterns can be complex in the embayments of Emory and Clinch rivers. The 2,100 cubic feet per second of flow required by the KIF cooling water system may be provided by the Emory River water alone about 18 percent of the time, primarily during December through March. Otherwise, water may flow upstream from the Clinch River through the Emory River embayment. Water may be pushed up the Emory River as a result of inflows that raise the pool elevation in Watts Bar Reservoir. Such inflow typically occurs when the reservoir is filling in the spring or during a spring flood event. Different rates and timing of releases from Watts Bar, Fort Loudoun, and Melton Hill reservoirs can also cause reverse flows in the Clinch River arm of Watts Bar Reservoir. Therefore, the potential exists for the water from the Clinch River to flow upstream on the Tennessee River during filling of Watts Bar Reservoir.

Water Quality (Pre-December 2008)
The Emory River arm of Watts Bar Reservoir is on the state 303(d) list of impaired waters (TDEC 2008a) because of sediments contaminated with polychlorinated biphenyls (PCBs) and chlordane from upstream industrial point sources. The section of the Emory above the influence of the Watts Bar impoundment is listed due to mercury from atmospheric deposition. Several tributaries of the Emory River upstream of KIF are listed for manganese, iron, and pH from historic coal mining activities. Furthermore, a few of these upstream tributaries are also impacted by sediment or other causes from agriculture or development activities.

The Clinch River arm of Watts Bar Reservoir is also on the state 303(d) list. The Clinch River is listed due to upstream PCBs and chlordane contamination of sediment from legacy pollutants, industrial point source discharges, and atmospheric deposition. Nearby tributaries past the Clinch that are also listed for PCBs, chlordane, and mercury, and one nearby tributary, listed for arsenic, may be the sources of contamination to the Clinch River. Some of this contamination occurs as a result of former United States Department of Energy (DOE) operations on the Oak Ridge Reservation (TDEC 2008a). Past DOE actions at Oak Ridge resulted in the contamination of sediments by radioactive and other wastes. The primary concern is PCB contamination in fish. Other contaminants include radioactive materials and metals.

TVA conducted the Vital Signs Monitoring Program on Watts Bar Reservoir annually from 1991 through 1994 to establish baseline data on the reservoir's ecological health under a range of weather and flow conditions. Since 1994, Watts Bar Reservoir continues to be monitored on a biannual basis. The reservoir ratings for Watts Bar have fluctuated between high "fair" and "poor" and have generally followed reservoir flow conditions with the lowest ratings during droughts resulting in low flows. Of the indicators included in the Vital Signs Monitoring Program, dissolved oxygen is the most responsive to flow rates.

Water Quality (Post-December 2008)
The KIF dike failure of December 22, 2008, released about 5.4 million cubic yards of coal ash along with about 327 million gallons of water. TDEC found exceedences of the more stringent criteria for chronic exposure of fish and aquatic life at least once in January 2009 for aluminum, cadmium, iron, and lead. Most of these exceedences were in the Emory River near the ash slide. TDEC criteria for thallium in waters that serve as a source of drinking water and from which fish are consumed have also been exceeded in some TDEC samples from both the Tennessee and Emory rivers, but there have been no exceedences of the Tennessee thallium standard for waters that serve as a source of drinking water only.

The chemical constituents of greatest concern are the metals contained in the ash. These trace constituents are chemically combined with the ash. Depending on the temperature, pH, and oxygen availability in the water, the metals may disassociate from the ash. As shown on the Web site www.tva.com, the maximum levels of arsenic, mercury, and selenium from all standard sampling locations on the Emory, Clinch, and Tennessee rivers have been below both the Tennessee Fish and Aquatic Life Criterions for Continuous Concentration and the Tennessee Domestic Water Supply Criterions.

Existing Wastewaters
There are several existing wastewater streams at KIF permitted under NPDES Number TN0005452. The condenser cooling water (CCW) discharge (Discharge 002) is the primary stream potentially affected by the proposed project. Cooling water for KIF's condensers is

pumped from the Watts Bar Reservoir pool at Emory River Mile 1.9. At full operating capacity, cooling water flows through the condensers at a rate of 1,297 millions of gallons per day (MGD).

3.2.2. Environmental Consequences

3.2.2.1. No Action Alternative

Under the No Action Alternative, TVA would continue to operate the existing gravity dewatering system described in the KIF scrubber EA (TVA 2006). As described above, the current process sends the ES from the scrubber directly to the GDA where it is dewatered by gravity, subsequently flowing to the storm water pond and then through Outfall 01A into the CCW channel. The KIF scrubber EA determined that the discharge associated with the KIF scrubber would have no significant impact on the aquatic environment of the Clinch River with the implementation of best management practices. This existing wastewater stream (Outfall 01A) is currently authorized under NPDES Permit No. 0080870.

In that EA, the scrubber blowdown flow was estimated to be 800 gallons per minute or 1.152 MGD. Based on the NPDES permit flow schematic for KIF, the average daily flow for the CCW (Outfall 002) is 1,296.87 MGD. Therefore, the KIF scrubber blowdown should only comprise 0.09 percent of the CCW discharge.

If KIF is burning 5.0 lb sulfur per mmBtu coals, this process change is estimated to result in a slight increase in flow from 1.152 MGD to a maximum of 1.613 MGD. However, if KIF burns 3.1 lb sulfur per mmBtu coals, the estimated flows are only 1.041 MGD, and at the current 50/50 blend of Powder River Basin/Central Appalachian Province (PRB/CAPP) coals, the estimated flows are only 0.749 MGD. Even at the maximum possible flow of 1.613 MGD, the proposed FGD discharge would only be 0.12 percent of the CCW flows (1,296.87 MGD).

If 5.0 lb sulfur coals are burned, the proposed process change may also increase the chloride concentrations in the scrubber discharge from approximately 3,400 milligrams per liter (mg/L) to a maximum of 4,100 mg/L. If 3.1 lb sulfur coals or the current blends of PRB/CAPP coals are burned, the estimated chloride concentrations would only be 1,550 mg/L or 2,300 mg/L, respectively.

Mass Balance for Current Operations

Mass balance is a mathematical accounting of the sources (inflows) and sinks (outflows) of a substance within a system, such as a water body. A mass balance model for a water body is useful to help understand the relationship between the loadings of a pollutant and the levels in the water, biota, and sediments. In both the existing operation and the proposed mechanical dewatering operation, the scrubber system would discharge into the KIF CCW.

The metals mass balance analysis for current operations is presented in Table 3-6. This analysis accounts for metal contaminants associated with scrubber blowdown in its current configuration, background river water entering the CCW, and the ash pond. The projected FGD concentrations were based on analyses of the Cumberland Fossil Plant FGD wastewater, the estimated KIF FGD concentration of 30 percent solids, and estimated maximum flow of 1.613 MGD. The projected river loadings were based on analyses of the KIF intake and a CCW flow of 1,296.87 MGD. The ash loadings were based on metals in the ash pond outfall from normal plant production as well as from the spill recovery

Table 3-6. Mass Balance of Current Operations

Element	River Concentration mg/L	River Loading lb/day	Ash Pond Concentration mg/L	Ash Pond Loading lb/day	FGD Concentration Estimates mg/L	FGD Loading Estimates lb/day	Total Current Concentration at DSN002 mg/L	Total Current Loading at DSN002 lb/day	Delta Total Current Loading at DSN002 vs. River lb/day	TDEC Water Quality Criteria mg/L
Aluminum	0.500	5673.83	0.800	285.24	0.320	2.67	0.55	6241.21	567.38	
Antimony	<0.001	11.35	0.002	0.78	0.003	0.03	<0.0010	11.35	0.00	0.0056
Arsenic	<0.001	11.35	0.022	7.84	0.003	0.03	0.0013	14.75	3.40	0.01
Barium	0.041	465.25	0.38	135.49	0.040	0.33	0.51	5787.30	5322.05	2.0
Beryllium	<0.001	11.35	<0.001	0.36	<0.0024	0.02	<0.0010	11.35	0.00	0.004
Boron	<0.020	226.95	0.45	160.45	12.0	100.20	<0.20	2269.53	2042.58	
Cadmium	<0.0005	5.67	<0.0005	0.18	0.0046	0.04	<0.0005	5.67	0.00	0.002
Chromium	<0.001	11.35	0.012	4.28	0.007	0.06	<0.001	11.35	0.00	0.1
Cobalt	<0.010	113.48	<0.010	3.57	<0.0024	0.02	<0.010	113.48	0.00	
Copper	0.0013	14.75	0.0026	0.93	0.0020	0.02	0.0071	80.57	65.82	0.013
Iron	0.300	3404.30	0.12	42.79	0.67	5.59	0.36	4085.15	680.86	
Lead	<0.001	11.35	<0.001	0.36	0.0020	0.02	<0.0010	11.35	0.00	0.005
Manganese	0.049	556.03	0.016	5.70	0.520	4.34	0.052	590.08	34.04	
Mercury	<0.0002	2.27	<0.0002	0.07	<0.00005	0.0004	<0.0020	22.70	20.43	0.0001
Molybdenum	0.006	68.09		0.00	0.080	0.67	0.0075	85.11	17.02	
Nickel	<0.002	22.70	0.0053	1.89	0.032	3.35	0.0022	24.96	2.27	0.1
Selenium	<0.001	11.35	0.0084	2.99	0.086	0.72	<0.0010	11.35	0.00	0.02
Silver	<0.0005	5.67	<0.0005	0.18	0.0001	0.00	<0.0050	56.74	51.06	0.0032
Thallium	<0.001	11.35	<0.001	0.36	0.002	0.11	<0.0010	11.35	0.00	0.00024
Tin	0.036	408.52	0.042	14.97	<0.005	0.04	0.037	419.86	11.35	
Titanium	<0.010	113.48	0.018	6.42	0.025	0.21	<0.010	113.48	0.00	
Zinc	<0.010	113.48	<0.010	3.57	0.050	0.42	<0.010	113.48	0.00	0.13

Abbreviations: lb/day = pounds per day; mg/L = milligrams per liter

Notes:

lb/day = concentration in mg/L x flow in MGD x 8.34 lb/gallon

River or CCW flow 1,359 MGD (river flow and data from KIF 2008 NPDES permit renewal application for intake)

Ash pond flow 42.7 MGD (ash pond flow and data from KIF 2008 NPDES permit renewal application for Discharge Serial Number [DSN] 001 [ash pond])

FGD storm water pond flow 1.0 MGD (FGD estimates for flow and chemical parameters taken from KIF 2009 FGD NPDES permit application)

DSN 002 current concentrations from KIF 2008 NPDES permit renewal application

operation. The input data and assumptions used in the mass balance including estimated concentrations of the scrubber blowdown are given in Table 3-6.

Mercury data used in Table 3-6 are based on previously approved USEPA analytical methods. USEPA has recently approved (2009) a new low-level mercury analytical method that provides lower detection limits allowing the plant site to show lower mercury concentration in the intake/raw water.

USEPA's analytical method for thallium has a detection limit currently at <0.001. The TDEC water quality criterion is a calculated value based on water organism and currently is below the USEPA-approved detection limit.

Toxicity testing was conducted to evaluate potential synergistic effects from the total FGD CCW mixture. Since that testing only found toxicities at concentrations approximately three orders of magnitude (x1000) stronger than the previously expected mixture of 0.09 percent, the proposed mixture of 0.12 percent in the FGD/CCW should only have a minor impact on the Clinch River, even without taking any benefits for mixing of the discharge in the receiving body.

3.2.2.2. Action Alternative

The proposed mechanical gypsum dewatering system would be similar to that discussed in the original KIF scrubber EA (TVA 2006). The primary difference between the existing gravity dewatering system and the proposed mechanical system is that the gypsum would be mechanically dewatered and then dry stacked and sold, instead of being dewatered by gravity before being processed and sold. As with the existing system, the process wastewater or blowdown from the proposed scrubber dewatering system would be treated in settling ponds prior to discharge to the CCW. While the current system discharges 30 percent solids into the GDA, the proposed operation would discharge 0.2 percent solids to the GDA. The scrubber pond system would be designed and operated to ensure that there would be no discharge of any visible scum, floating materials, or objectionable color contrast, nor a significant discharge of total suspended solids.

In addition, TVA proposes operational monitoring of the GDA for constituents of concern in the discharge to ensure the concentrations of these metals and other parameters do not adversely impact water quality in the Clinch River. Mitigation measures would be identified, as needed, to ensure the combined discharges from the scrubber operations have no significant impact on the receiving stream.

3.2.2.3. Cumulative Impact

A foreseeable future action is the potential disposal of fly ash in Phase II of the gypsum landfill as described in the *Kingston Dry Fly Ash Conversion Final Environmental Assessment* (TVA 2010). If that were to occur, CCW Discharge 002 is the primary wastewater stream that has the potential to be affected. At full operating capacity, cooling water flows through the condensers at a rate of 1,297 MGD. The cumulative impact of storing fly ash in the Phase II gypsum area is discussed below.

As mentioned in Section 1.3 of TVA 2010, TVA has assessed a plan to use the 43-acre area east of the GDA for dry fly ash storage. Surface runoff and the leachate collection system (LCS) discharge from the disposal of fly ash in the Phase II area would drain through the GDA and discharge to the CCW. The potential impact of this discharge was evaluated using the metals analysis presented in Table 3-6.

To estimate the concentration of metal in the CCW discharge channel after receiving discharges from the proposed fly ash storage area and the proposed scrubber operations, the maximum toxicity characteristic leaching procedure data from the KIF recovery project data set and the Johnsonville coal-fired plant fly ash landfill data set were used in Table 3-7. Assumptions included no cap on the fly ash storage area and operations similar to the Johnsonville Fossil Plant landfill. The added loadings from the fly ash storage area LCS discharge would increase the metals concentration at the CCW discharge, but the concentrations would not exceed the lowest TDEC water quality criteria with the exception of cadmium (Table 3-7). This analysis represents the "worst-case" review since the KIF and Johnsonville data sets had 65 data points for cadmium of which 56 data points were nondetection and eight other cadmium concentrations ranged from 0.01 to 0.15 mg/L. Only one data point was exceptionally high with a concentration of 1.46 mg/L. This data point represents the worst-case condition and was used in Table 3-7.

Table 3-7. Cumulative Impact of Fly Ash Storage Leachate Total Mixed Concentration Estimates

Element	Estimated Fly Ash Leachate Concentration mg/L	Estimated Fly Ash Leachate Loading lb/day	Total Current Concentration at DSN 002 mg/L	Total Current Loading at DSN 002 lb/day	Estimated Total Mixed Concentration at DSN 002 mg/L	Estimated Total Mixed Loading at DSN 002 lb/day	TDEC Water Quality Criteria
Arsenic	0.28	3.77	0.0013	14.75	0.0016	18.52	0.01
Barium	4.28	57.6	0.51	5787.30	0.5145	5844.91	2.0
Cadmium	0.0414	0.557	<0.0005	5.67	0.0005	6.23	0.002
Chromium	0.069	0.929	<0.001	11.35	0.0011	12.28	0.1
Copper	0.149	2.01	0.0071	80.57	0.0073	82.57	0.013
Lead	0.685	9.22	<0.0010	11.35	0.0018	20.57	0.005
Mercury	0.002	0.0269	<0.0020	22.70	0.0020	22.72	0.0001
Nickel	0.128	1.72	0.0022	24.96	0.0023	26.69	0.10
Selenium	0.31	4.17	<0.0010	11.35	0.0014	15.52	0.02
Silver	0.05	0.673	<0.0050	56.74	0.0051	57.41	0.0032
Zinc	3.22	43.3	<0.010	113.48	0.0138	156.82	0.13

Abbreviations: lb/day = pounds per day; mg/L = milligrams per liter
Notes:
Estimated fly ash leachate flow = 1.612 MGD
Cadmium concentration = 56x<0.0005 mg/L+8x0.15 mg/L+1.46/65 = 0.0414 mg/L
Total combined flow from DSN 01A and DSN 002 = 1.0+1359 = 1360.612 MGD
Estimated total mixed mercury concentration at DSN 002 is higher than TDEC water quality criteria.
Mercury concentration (data) use in Table 3-7 is based on previously approved USEPA analytical methods.
USEPA has recently approved (2009) a new low-level mercury analytical method that provides lower detection limits allowing the plant site to show lower mercury concentration in the raw water, intake, and cooling water.
Source: TDEC Criteria, Rule 1200-04-03-.03 (TDEC 2008b)

Conclusions

Results of the mass balance analysis show that the concentrations of the constituents of concern at DSN 002 would be at or below the TDEC lowest criteria considering capability of the analytical method (i.e., for some constituents, the detection limit of the analytical method may be equal to or higher than the minimum water quality criteria). TDEC's NPDES permit rationale confirms that the metal concentrations for the existing system have insignificant impact on the water quality of Watts Bar Reservoir. The water quality impacts of the new system are similar. Even after accounting for the cumulative impact of the fly ash storage leachate, the impact at DSN 002 would be insignificant.

TVA would conduct an operational characterization of the waters of the GDA to confirm no significant impacts to the Clinch River. The waters would be analyzed for metals and other

parameters. If determined to be necessary, appropriate mitigating measures would be evaluated and implemented to ensure that the discharge NPDES permit requirements for the water quality parameters are met.

3.3. Solid Waste

3.3.1. Affected Environment

KIF is expected to burn between 3.2 and 4.4 million tons of coal annually. Historically, KIF has produced two CCPs, fly ash, and bottom ash, which have predominantly been disposed of at the plant site by means of wet operations. To reduce systemwide SO_2 emissions and to meet requirements under the 1990 Clean Air Act, as well as to maintain compliance with the USEPA Title IV regulations for the Acid Rain Program, TVA has installed FGD equipment using LSFO technology at KIF. This process is producing a third CCP by-product in the form of synthetic gypsum.

The amount of gypsum produced by LSFO scrubbing is dependent on the sulfur content and heating value of the coal, absorber efficiency, and the amount of coal fired. The maximum theoretical gypsum production at KIF based on 75 percent capacity factor for operation of the plant and the use of 5.0 lb sulfur per mmBtu coal is expected to be 560,000 tons per year.

Previous planning involved the marketing of the FGD by-product with the excess volume being placed in a permitted on-site disposal area by a wet process termed rim ditch stacking. The GDA at KIF is located on the west bank of the Clinch River/Watts Bar Reservoir (Figure 1-1). This area is permitted as a Class II waste disposal facility that meets the design and siting criteria of TDEC's Division of Solid Waste Management.

KIF is considered a small quantity generator by TDEC for generation of hazardous waste. The types of these wastes currently generated include small quantities of waste paint; waste paint solvents; mercury contaminated debris; sandblasting, scraping, paint chips; solvent rags due to cleaning electric generating equipment; Coulomat (used as moisture removal from oil); and liquid-filled fuses.

3.3.2. Environmental Consequences

3.3.2.1. No Action Alternative

Under the No Action Alternative, TVA would continue with previous plans for operation of the new FGD system at KIF along with operation of the GDA as a rim ditch process. That operation is described in the KIF scrubber EA (TVA 2006). In this mode, the FGD solids would be directed from the main FGD absorber area to a ditch inside the GDA by sluice line. Gypsum particles would be allowed to collect as sediment in the ditch by gravity and would be mechanically transferred by backhoes to an adjacent dewatering area prior to being taken for final disposal in the GDA. The rim ditch would follow the stacking operation vertically as the elevation of the disposal operations increased. The FGD rim ditch disposal operation would continue until capacity in the disposal area is exhausted and the area is ready for final closure in accordance with the facility permit.

3.3.2.2. Action Alternative

Under the Action Alternative, TVA would direct the ES from the main FGD absorbers directly to a holding tank at the proposed FGD dewatering facility as opposed to sending the ES directly to the GDA. As described in Section 2.1, primary removal of FGD slurry

particles would involve mechanical dewatering of the slurry with the gypsum solids collected for marketing or sent to the GDA. Overflow , containing the residual fines of the slurry solids, would flow to a storage tank and then be directed to the GDA along with any other process wastes and wash downs. Tertiary fines removal would then take place in the GDA. In addition to routine operation, the GDA must also be able to handle scheduled and unscheduled emergency bypasses of wet FGD effluent during outages of the dewatering facility.

The GDA would primarily be operated to facilitate removal of residual fine particles remaining in the flow emanating from the dewatering facility. In this manner, FGD effluent would be directed to perimeter rim ditches as it enters the disposal area. As sedimentation occurs, material would be dipped from these ditches using track hoes, cast to the side, and allowed to drain/dewater prior to being transported to the center of the disposal area where it would be placed and compacted in a dried state as depicted in Figure 3-1. Flow of the FGD stream would proceed westerly in the rim ditches, through a settling pond, which would be constructed at the west end of the GDA. Discharge would be to the stilling pool and ultimately to the permitted NPDES outfall.

Initially, TVA proposes to operate the rim ditch operation along both the north and south sides of the GDA. As plant operations change and more gypsum is stacked in the southern side, handling of the gypsum would be accomplished using the north ditch only. At that time, the south ditch would be abandoned by dry stacking gypsum in the area. The described stacking operation would continue until the capacity for disposal in the GDA has been reached. Final closure would be accomplished in accordance with the facility permit. A center corridor underdrain system was constructed as part of the original GDA facility design, and additional finger drains are being installed to enhance the operation of the constructed drainage system underlying the gypsum stack as depicted in Figure 3-2. These enhancements are design improvements to reduce water levels in the GDA and improve overall stability of the stack. A modification to the operations plan for the facility permit would be required to reflect the changes in the handling of gypsum in the disposal area.

Conclusion
There would be no impacts to the disposal of gypsum with either the Action or No Action Alternatives, as neither alternative changes the volume of the gypsum being disposed.

The status of KIF as a small quantity generator of hazardous waste would not change as a result of implementing the proposed Action Alternative.

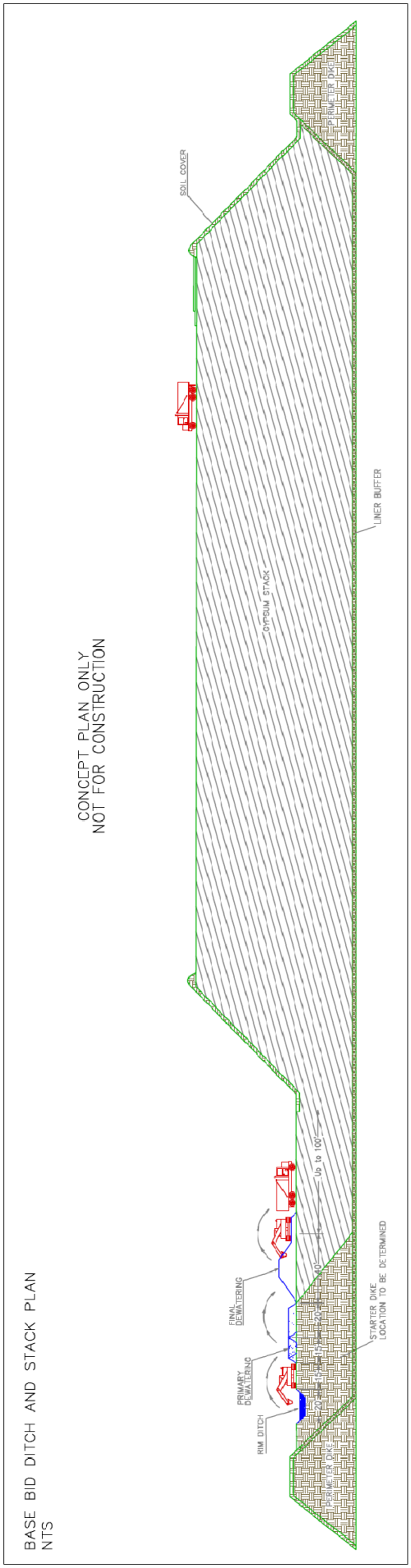

Figure 3-1. Cross Section of Proposed Dry Gypsum Stacking Plan

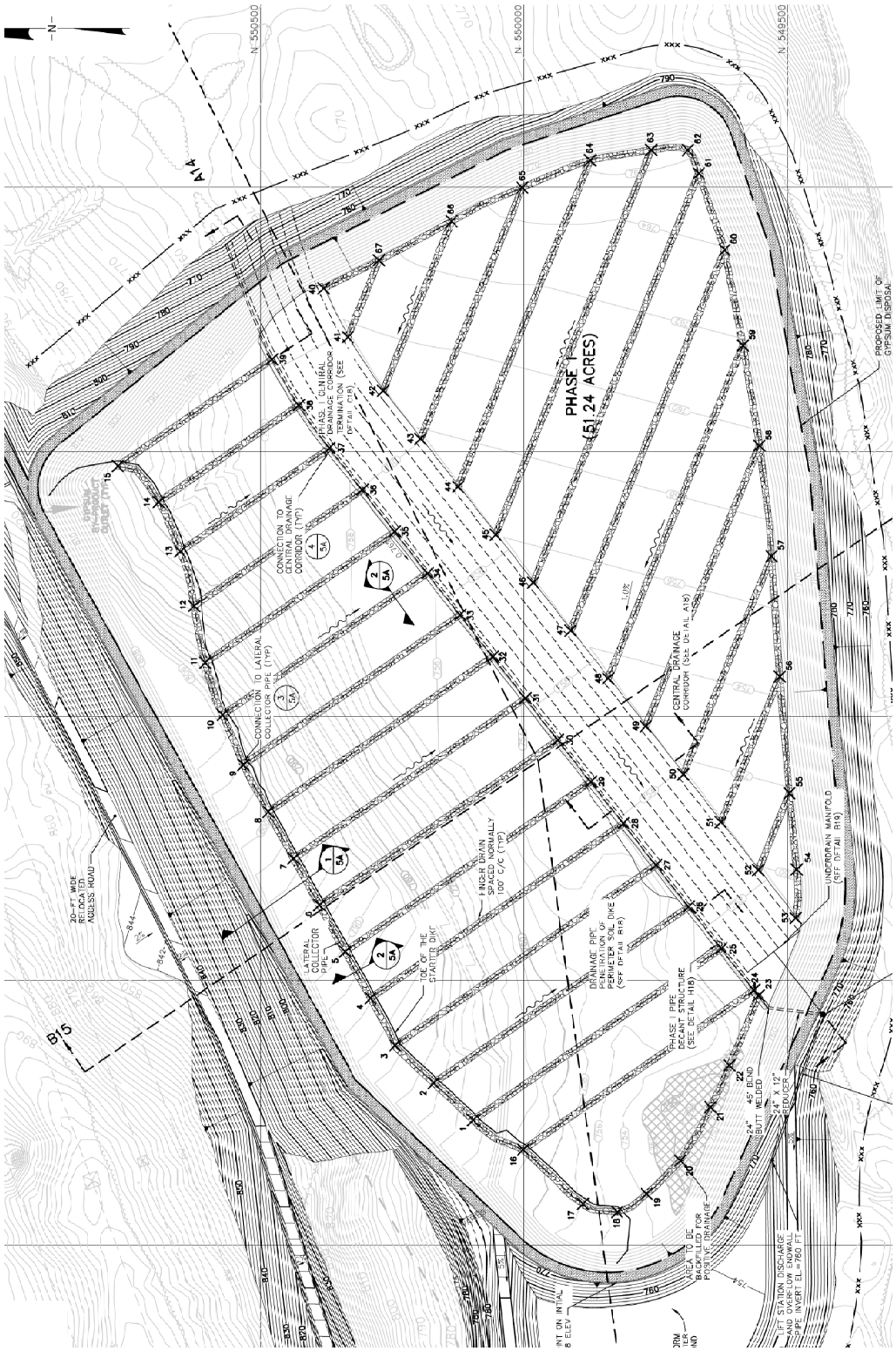

Figure 3-2. General Arrangement of Additional Finger Drains Being Installed for Better Stability

3.4. Transportation

3.4.1. Affected Environment

KIF is served by roadway, railway, and waterway modes of transportation. No barge facilities are currently located on site. Much of the property along the Clinch River a few miles upstream from KIF belongs to DOE; however, shoreline residential properties and recreational areas are in close proximity to the site.

Primary access to KIF is via Swan Pond Road from US 70, which is a principal, four-lane divided highway with wide shoulders traversing a gently rolling suburban area in an east-west direction. Swan Pond Road is a rural, two-lane road with a slightly rolling terrain. Trucks exiting the KIF reservation by way of Swan Pond Road would travel west on US 70 to Pine Ridge Road and then to I-40 or State Route (SR) 27. Therefore, Swan Pond Road, US 70, and Pine Ridge Road are the common routes considered and are identified as such in Table 3-8 along with the Annual Average Daily Traffic (AADT) counts and the specified level of service (LOS) for the road way. Figure 3-3 illustrates the common routes.

Table 3-8. Annual Average Daily Traffic From 2008 With Projected Data and Level of Service Data from the Analyses

Route	Traffic Data 2009 AADT	Projected 2010 Traffic	LOS	Traffic 2010 With Increase	LOS	Comments
Swan Pond Road	3,331	3,564	B	3,584	B	Common access road from plant
US 70	9,460	10,122	A	10,142	A	Common access
Pine Ridge Road	10,672	11,419	A	11,439	A	Access road common to I-40 or US 27

TVA has an approved on-site landfill for disposal of gypsum. Additionally, no other landfill locations have been identified or selected to accept the dewatered gypsum material from KIF by truck hauling on roadway or railcar on railway. Therefore, for purposes of the marketing of gypsum only, the common routes mentioned previously will be analyzed and discussed in this report.

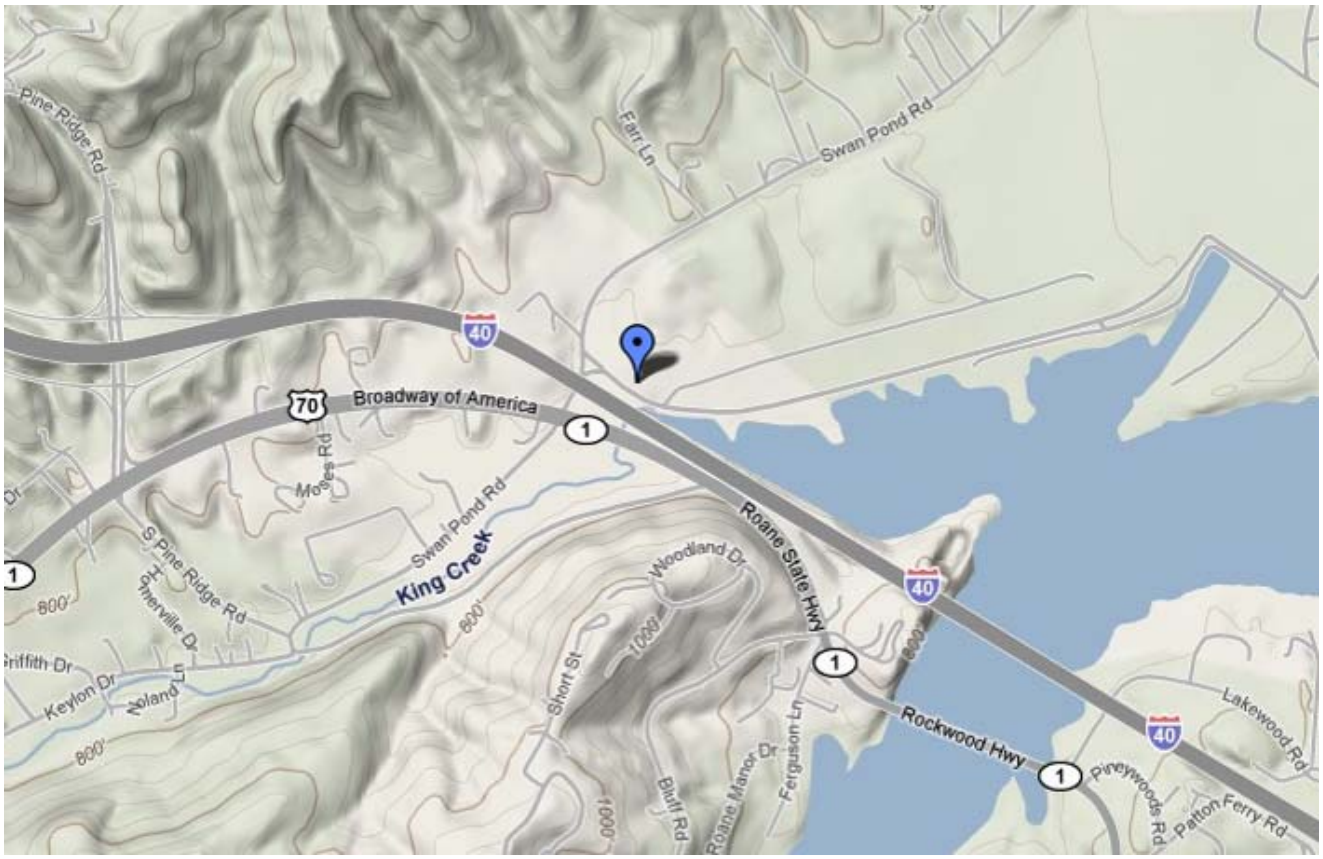

Figure 3-3. Kingston Fossil Plant Common Route

3.4.2. Environmental Consequences

3.4.2.1. No Action Alternative

If gypsum materials were not hauled to an off-site location for marketing, no transportation impacts would occur. No decisions have been made concerning marketing of the gypsum.

3.4.2.2. Action Alternative

This analysis evaluates the impacts of transporting dewatered gypsum materials by trucks on the affected transportation network and is based on the assumption that 80,000 tons of gypsum material could be hauled off site per year. Each truck has a 24-ton capacity. Based on 200 workdays per year, approximately 20 truck trips are generated for hauling the gypsum material to an off-site facility.

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

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

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

Table 3-8 contains the AADT from 2009 with projected data and LOS data from the analysis, based on 20 truck trips for the days gypsum is hauled from the plant (Tennessee Department of Transportation 2009). The projected values for 2010 include: (a) 7 percent annual increase in AADT and (b) the additional traffic due to hauling gypsum. The analysis assumes that 100 percent of the additional traffic would use Swan Pond Road, US 70, and Pine Ridge Road to reach SR 27 or I-40. According to the *Highway Capacity Manual* (Transportation Research Board 2000), most design or planning efforts typically maintain service rates at LOS C or D, to ensure an acceptable operating service for facility users that minimizes the inconveniences resulting from traffic delays.

Based on this analysis, no LOS change occurs among any of the common routes. The truck traffic generated from hauling gypsum is insignificant compared to the daily traffic. For a Class II highway, such as Swan Pond Road, LOS is measured by the percent time-spent-following another vehicle. For Swan Pond Road, there is only a 0.1 percent increase difference between the projected 2010 AADT and the increase due to truck traffic.

The typical hauling days for KIF gypsum material would be on the weekdays. It is unlikely that hauling would be done on weekends or holidays, which tend to be the peak traveling days for any highway.

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

In addition to the LOS analyses, an analysis of accidents was performed using information taken from a U.S. Department of Transportation (USDOT), Federal Motor Carrier Safety Administration (FMCSA) report (USDOT 2010). The data used are for large trucks, which are classified as vehicles weighing more than 10,000 tons. Information presented in this report uses a basis of 100 million vehicle-miles for most rates shown in the report. To

perform the accident analysis for the previously identified common routes, a beginning and ending point needed to be determined so a total distance traveled for one truck trip could be obtained. The beginning point is the point where the truck first enters onto the roadway, while the ending point is that point of the roadway that intersects with either a major route or the next collector road. Based on the information provided in the 2008 report and using the total distance traveled for each roadway as described above, the following data in Table 3-9 were obtained for potential accidents.

Table 3-9. Truck Hauling Fatality and Injury Data

Common Route	Fatalities per year	Injuries per Year
US 70	6E-04	0.032
Swan Pond	1.2E-04	0.006
Pine Ridge	6E-05	0.003

Based on this analysis, it is extremely unlikely that there would be any fatalities or injuries due to the hauling of gypsum material.

If the decision is made to haul the gypsum off site, there is the possibility that the hauling of both dry fly ash and gypsum material could occur on the same day. As mentioned above, since no landfills or marketing destinations have been identified for the gypsum material, only the common routes can be considered in this analysis. The LOS for each route was determined as described above. Table 3-10 shows the LOS for the projected 2010 AADT and the LOS with the combined truck increase.

Table 3-10. Annual Average Daily Traffic From 2009 with Projected Data and Level of Service Data from the Analyses

Route	LOS With Projected 2010 AADT	LOS With Truck Traffic Increase	Comments
US 70	A	A	Common access
Swan Pond Road	B	B	Common access road from plant
Pine Ridge Road	B	B	Access road common to I-40 or US 27

As indicated in Table 3-10, in the event that both materials were hauled on the same day, there would be no significant impact to the transportation networks mentioned.

CHAPTER 4

4.0 LIST OF PREPARERS

4.1. NEPA Project Management

Dave W. Robinson

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

4.2. Other Contributors

J. Chris Buttram, P.E.

Position:	Senior Civil Engineer
Education:	B.S., Civil Engineering
Experience:	10 years in Civil/Site, Structural, and Highway Engineering
Involvement:	Transportation

Samuel Hixson

Position:	Senior Water Specialist
Education:	M.S., Environmental Engineering; B.A., Chemistry
Experience:	21 years in Wastewater and Water Treatment, NPDES Permitting and Compliance,
Involvement:	Water Resources, Surface Water, and Water Quality

Mary E. Jacobs

Position:	Atmospheric Analyst
Education:	B.S., Mathematics
Experience:	19 years in Air Quality Analysis
Involvement:	Air Resources

Amos Smith

Position:	Contract Geologist
Education:	B.S., Geology
Experience:	30 years in Solid and Hazardous Waste
Involvement:	Solid and Hazardous Waste

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CHAPTER 5

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

Federal Agencies

National Park Service
U.S. Department of Energy

State Agencies

Tennessee Department of Environment and Conservation
Tennessee Wildlife Resources Agency

Individuals

The Honorable Mike Farmer
Mayor of Roane County
Kingston, Tennessee

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CHAPTER 6

6.0 LITERATURE CITED

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Appendix A – Correspondence

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STATE OF TENNESSEE
DEPARTMENT OF ENVIRONMENT AND CONSERVATION
WATER SUPPLY
9th Floor, 401 Church Street
Nashville, Tennessee 37243-1549
Phone: (615) 532-0191; Fax: (615) 532-0503

September 29, 2010

Mr. David Robinson
NEPA Compliance
Tennessee Valley Authority
1101 Market Street, LP-5U
Chattanooga, Tennessee 37402

RE: Request for Comments, Draft Supplemental Environmental Assessment (DSEA) Package
Gypsum Dewatering System at Kingston Fossil Plant
Roane County Tennessee

Mr. Robinson:

The Division of Water Supply has received and reviewed the DSEA for the Gypsum Dewatering System at Kingston Fossil Plant Project and would like to thank the Tennessee Valley Authority for the opportunity to comment on this plan.

Drinking Water Program:

In regards to this project, there no public water distribution lines located near the project site. The project site is upstream of the Kingston Intake. If you have any questions on public water supplies contact Mr. Bill Hench who is the chief engineer for the division. Mr. Hench may be reached by e-mail bill.hench@tn.gov or by telephone at (615)532-0165.

Safe Dams Program:

A file review was conducted of all registered sites in the Safe dam program. There are no registered dams in the proposed project area. The contact for information in the Safe Dams Program can be obtained from Mr. Lyle Bentley Manger of the Safe Dams Section in the Division of Water Supply. Mr. Bentley may be reached by e-mail lyle.bentley@tn.gov or by telephone at (615) 532-0154.

Source Water Protection Program:

A review of the community and non-community water supplies in the area shows that there are no Wellhead Protection Areas or Source Water Protection Areas located within this proposed project area the project is upstream of the Kingston Water intake Any information on the Source Water/Wellhead Protection areas can be directed to Mr. Scotty D. Sorrells Manager Groundwater Management Section. Mr. Sorrells may be reached by e-mail scotty.sorrells@tn.gov or by telephone at (615) 532-9224.

Mr. Robinson
Request for Comments, Draft Supplemental Environmental Assessment (DSEA) Package Gypsum Dewatering System at Kingston Fossil Plant
September 29, 2010
Page 2

Water Well Program:

A file review was conducted of all the registered private water wells within this proposed route. Please contact Mr. Luke Ewing with the names of the topographic quads. There are private water supplies in the proposed area. Please be advised that not all the water wells that are in existence are on this database and that there may be older wells that we have no record of as well as hand dug wells whose existence we would not have recorded. All water wells that are encountered should be plugged and abandoned by a licensed well contractor. Any information related to the Water Well Program can be directed to Mr. Luke Ewing Manager Water Well Program. Mr. Ewing can be reached by e-mail luke.ewing@tn.gov or by telephone at (615) 532-0176.

Underground Injection Control:

A file review was conducted of all the registered Underground injection Control (UIC) points within the area of review. No registered UIC sites are within the proposed area Please be advised that not all old large capacity septic systems or stormwater injection points that are in existence are on this database. All UIC wells that are encountered should be inventoried and approved or plugged and abandoned according to approval from the UIC program.

The plan for the proposed project locates the project in a karst area, the county you are working in is in mature karst terrain and has abundant sinkholes and other karst features. In Tennessee the modification of sinkholes is regulated under the Underground Injection Control (UIC) Program, which is housed in the Ground Water Management Section. If there is to be a modification of any sinkhole on this project it will be necessary for you to have a letter of authorization from the UIC program to proceed. You will need to contact Carolyn Sullivan of my staff to file the application and obtain the authorization.

Once the final footprint of the project has been determined, we will need a map(s) showing the sinkholes identified before construction that will be modified showing locations with latitudes and longitudes and information as to the modification to be performed on the sinkhole. Note that the sinkholes which show on a 7 ½ minute quadrangle topographic map are by no means a complete representation (they typically represent about 5 - 20% of the actual sinkholes).

Please be advised that the sinkhole is considered the entire closed depression whether there is an open throat or not and not just the area near an open throat.

Extreme caution should be used in the filling and construction on or in a sinkhole. It may be necessary to add extra support over the expanse of a sinkhole, even after the sinkhole has been filled. A sinkhole by nature is an unstable geologic area, which has no permanent means of stabilization and is subject to times of movement and settling. This uncontrollable movement may cause some damage to any permanent structure placed on or around the karst feature. The State of Tennessee assumes no responsibility in potential consequences of building on filled depressions of any kind at any time.

Mr. Robinson
Request for Comments, Draft Supplemental Environmental Assessment (DSEA) Package Gypsum Dewatering System at Kingston Fossil Plant
September 29, 2010
Page 3

Any information on the UIC programs can be directed to Ms. Carolyn Sullivan UIC Program Groundwater Management Section. Ms. Sullivan may be reached by e-mail carolyn.sullivan@tn.gov or by telephone at (615) 532-0180.

This letter represents a brief review off best available data sources and not a comprehensive field evaluation. Please verify all information contained within this letter in the field.

The issuance of this letter does not convey any property rights in either real or personal property, or any exclusive privileges, nor does it authorize any injury to private property or any invasion of personal rights, nor any infringement of federal, State, or local laws or regulations.

If you have any questions, feel free to call me at (615) 532-9224 or email at scotty.sorrells@tn.gov.

Sincerely,

Scotty D. Sorrells
Manager Ground Water Management Section
Source Water Protection Coordinator
Division of Water Supply

c: Thomas A. Moss Acting Director DWS
William Hench PE Engineering Section
Lyle Bentley Chief SDP
Luke Ewing Manager WWP
Carolyn Sullivan UIC
David Greif GWMS

Department of Energy
Oak Ridge Office
P.O. Box 2001
Oak Ridge, Tennessee 37831
September 30, 2010

Document
SEP 30 2010
Received

Ms. Susan J. Kelly
Senior Manager
Environmental Permits and Compliance
Tennessee Valley Authority
1101 Market Street
Chattanooga, Tennessee 37402-2801

Dear Ms. Kelly:

COMMENTS ON DRAFT ENVIRONMENTAL ASSESSMENT – INSTALLATION OF A MECHANICAL GYPSUM DEWATERING SYSTEM AT KINGSTON FOSSIL PLANT – ROANE COUNTY, TENNESSEE

In response to your letter to Gerald Boyd dated August 30, 2010, we have reviewed the subject Draft Environmental Assessment and have the following comments:

Page 3, Section 1.5, The Scoping Process, Title – Change the title of this section "The Scoping Process" to "Environmental Assessment Scope and Public Review" since the present title sounds too similar to the process for an Environmental Impact Statement.

Page 4, Section 1.5, The Scoping Process, lines 1 – 2 – Add the URL for TVA's external Web site at the end of this sentence.

Page 8, Figure 2-1. Project Equipment to be Installed – The font on this figure is too small to be easily readable.

Page 16, Section 3.1.2.1, No Action Alternative – Explain the air impacts of the no action alternative in this section.

Page 23, Section 3.2.2.3, Cumulative Impact – Cumulative impacts are presented only for water resources. Cumulative impacts to other resources need to be presented in the document.

Ms. Susan J. Kelly -2- September 30, 2010

SUBJECT: COMMENTS ON DRAFT ENVIRONMENTAL ASSESSMENT – INSTALLATION OF A MECHANICAL GYPSUM DEWATERING SYSTEM AT KINGSTON FOSSIL PLANT – ROANE COUNTY, TENNESSEE

If you have questions concerning these comments, please contact me at 865-576-0273 or hartmangs@oro.doe.gov.

Sincerely,

Gary S. Hartman
ORO NEPA Compliance Officer

cc:
David R. Allen, SE-32
Randall C. Smyth, SE-30
Robert J. Brown, M-2
Teresa C. Perry, SE-30

United States Department of the Interior

FISH AND WILDLIFE SERVICE
446 Neal Street
Cookeville, TN 38501

Document
OCT 05 2010
Received

September 30, 2010

Mr. Dave Robinson
Tennessee Valley Authority
1101 Market Street, MR 2T
Chattanooga, Tennessee 37402

Re: FWS #2010-CPA-0741

Dear Mr. Robinson:

Thank you for your letter received September 3, 2010, regarding the Draft Supplemental Environmental Assessment (DSEA) for the installation of a mechanical gypsum dewatering system at the Kingston Fossil Plant in Roane County, Tennessee. We previously provided comments on the 2006 EA for the Installation of Flue Gas Desulfurization System on the Kingston Fossil Plant (FWS #2006-EC-0148). U.S. Fish and Wildlife Service (Service) personnel have reviewed the DSEA and offer the following comments for consideration.

The DSEA has incorporated Emory River and Clinch River hydrogeological and physicochemical data, mass balance calculations for a variety of fly ash constituents, and projected effluent concentrations associated with the operation of the gypsum dewatering system. Much of the project-related data utilized for the presented information in the DSEA were generated during investigations of the 2008 Kingston fly ash release. Since this action proposes additional discharges and pollutant loading to the aquatic environment, we are concerned that the Tennessee Valley Authority (TVA) has not made a finding regarding potential affects to aquatic and aquatic-dependent receptors that utilize the Emory and Clinch Rivers at and downstream of the Kingston Fossil Plant, including federally listed species. Therefore, the assumptions made for the 2006 EA are no longer entirely valid. We strongly encourage TVA to make a determination on this specific action pursuant to section 7 of the Endangered Species Act.

These constitute the comments of the Department of Interior pursuant to the Clean Water Act (86 Stat. 816, as amended: 33 U.S.C 1251 et seq.), Endangered Species Act (87 Stat. 884, as amended: 16 U.S.C. 1531 et seq.), and the Migratory Bird Treaty Act (16 U.S.C. 703-711). Thank you for the opportunity to comment on this action. If you have any questions, please contact Steve Alexander of my staff at 931/528-6481 (ext. 210) or via e-mail at *steven_alexander@fws.gov*.

Sincerely,

for Mary E. Jennings
Field Supervisor

Tennessee Valley Authority, 1101 Market Street, Chattanooga, Tennessee 37402-2801

November 23, 2010

Ms. Mary E. Jennings
Field Supervisor
Cookeville Ecological Services Office
Fish and Wildlife Service
446 Neal Street
Cookeville, Tennessee 38501

Dear Ms. Jennings:

Thank you for your letter dated September 30, 2010, commenting on the Draft Supplemental Environmental Assessment (DSEA) for the proposed installation of a mechanical gypsum dewatering system at the Kingston Fossil Plant (KIF). In the letter, you requested that TVA make a finding regarding this specific action on aquatic receptors downstream of KIF pursuant to Section 7 of the Endangered Species Act.

TVA has not identified any additional effects on aquatic habitats or water quality in the Emory and Clinch Rivers as a result of the operation of the mechanical gypsum dewatering system. Current water quality monitoring in the Emory, Clinch, and Tennessee Rivers, adjacent to and downstream of the Kingston site, indicates that no metal or chemical concentrations exceed the state water quality standards for aquatic life. Additionally, the water quality analysis in Section 3 of the DSEA provides a mass balance (see Table 3-6 of DSEA) for the pollutant loadings from all current activities, concluding that the pollutant concentrations would not exceed state water quality standards for aquatic life. Effluent from the proposed mechanical gypsum dewatering system would not result in any noticeable change in current water quality conditions. This system would significantly reduce the percent solids in the scrubber discharge to the Gypsum Disposal Area (GDA). As indicated in the DSEA, while the current system discharges 30 percent solids into the GDA, the proposed dewatering system would discharge 0.2 percent solids to the GDA. Further, the DSEA also assesses the cumulative impacts of foreseeable future actions, and concludes that the cumulative pollutant concentrations would not exceed state water quality standards for aquatic life. Moreover, available data indicates that no species federally listed as threatened or endangered are present in the area. Therefore, TVA concludes that the proposed mechanical dewatering system would not affect any federally listed threatened or endangered species or their habitat.

The Tennessee Department of Environment and Conservation (TDEC) recently issued a Draft National Pollutant Discharge Elimination System (NPDES) Permit TN0005452 for KIF. This draft permit covers all discharge outfalls from the Kingston Fossil Plant, including the discharge outfall for the existing Flue Gas Desulfurization (FGD) system covered under NPDES Permit TN0080870. In both NPDES Permit TN0080870 and Draft Permit

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TN0005452, TDEC evaluated the potential impacts on water quality and aquatic environment downstream of Kingston Fossil Plant (KIF) from the discharges at KIF. This evaluation is available on TDEC's website. Based on the water quality based effluent calculations, TDEC concludes that the reported effluent concentrations are lower than calculated effluent concentrations necessary to protect water quality in the Clinch River or Tennessee River downstream of Kingston Fossil Plant. This TDEC conclusion confirms TVA's assessment in the DSEA of the potential impact of the FGD discharge on water quality and the aquatic environment.

If you have any questions, please contact Bo Baxter by telephone at (865) 632-3360 or by email at jtbaxter@tva.gov or Dave Robinson at (423)751-2502 or email at dwrobins@tva.gov.

Sincerely,

Susan J. Kelly, Senior Manager
Federal Determinations

DWR:PS
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