

FINDING OF NO SIGNIFICANT IMPACT
TENNESSEE VALLEY AUTHORITY
PARADISE FOSSIL PLANT UNITS 1 AND 2 –
MERCURY AIR TOXICS STANDARDS COMPLIANCE PROJECT

Tennessee Valley Authority (TVA) operates three coal-fired generating units at Paradise Fossil Plant (PAF) located in Muhlenberg County, Kentucky, which are subject to the U.S. Environmental Protection Agency (USEPA) Mercury and Air Toxics Standards (MATS) for hazardous air pollutants (HAP) emissions from existing electric utility steam generating units. The USEPA established the particulate matter (PM) limit of 0.030 pounds per million British thermal units (lb/mmBtu) as a means of demonstrating compliance with the MATS for non-mercury HAP metals. PAF Unit 3 meets the MATS without installation of additional emission control equipment. Units 1 and 2, which each have a generating capacity of 704 megawatts (MW), do not meet the PM limit of 0.030 lb/mmBtu in their current configurations.

Power system demand and load studies show the need to maintain at least 800 MW of the generating capacity currently provided by PAF Units 1 and 2. TVA must therefore determine how to comply with MATS while maintaining the necessary reliable generating capacity in the PAF service area. Additional goals of TVA's proposed action include minimizing overall costs, maximizing the use of TVA facilities, minimizing construction of new transmission system components and upgrades of existing transmission system components, and maintaining a balanced portfolio of energy sources.

The proposed action is the subject of an environmental assessment (EA) prepared by TVA in accordance with the National Environmental Policy Act. The EA is incorporated by reference.

Alternatives

The EA evaluates the No Action Alternative and two action alternatives. Under the No Action Alternative (Alternative A), TVA would continue to operate PAF Units 1 and 2 and would not implement activities to further reduce emissions to comply with MATS. This alternative would also be inconsistent with TVA's goals to provide cleaner, reliable, and affordable energy to its customers. Therefore, this alternative is not considered viable or reasonable. It does, however, provide the necessary and appropriate baseline for evaluating the anticipated environmental effects of the proposed action.

Under Alternative B – Install and Operate Pulse Jet Fabric Filter (PJFF) Systems, TVA would install PJFF systems for MATS compliance on units 1 and 2. The PJFF systems would be installed northwest of the existing boilers and occupy about one acre of the existing bottom ash pond. Additional actions include reconfiguration of the existing dry hydrated lime injection system; upgrades to sluicing systems to assure ash collected in the PJFF would be transferred efficiently through existing sluice lines, and constructing a 161-kilovolt (kV) transmission line(s) from the main switchyard to a new substation on-site at PAF.

Under Alternative C – Construct and Operate Combustion Turbine/Combined Cycle (CT/CC) Plant, TVA would construct and operate a new CT/CC plant with a summer generating capacity of up to approximately 1,025 MW when operated in CC mode. The CT/CC plant would include three or four natural gas-fired generators, three heat recovery steam generators and one steam turbine generator, and would be located just north of the existing coal pile and to the west of the Green River on an approximately 50-acre site. PAF Units 1 and 2 would be retired. Other components of this alternative include a water-cooled condenser, mechanical-draft cooling tower, water intake structure in the Green River, wastewater processing pond, selective catalytic reduction systems, and ammonia handling and storage equipment. A 161-kV transmission line connection from the main PAF switchyard to the new CT/CC plant switchyard would also be constructed. Alternative C would also require the construction and operation of a new natural gas pipeline 10 to 20 miles in length to connect the plant to an existing interstate gas pipeline. The plant would be designed to use either fuel oil or natural gas as a redundant fuel supply. If fuel oil is used, above-ground storage tanks and fuel handling equipment would be constructed. If natural gas is used, a second pipeline connecting to an interstate gas pipeline would be constructed.

Impacts Assessment

Based on the analyses in the EA, TVA concludes that implementation of Alternative B (including the transmission line component) and CT/CC plant and transmission line components of Alternative C would not affect prime or unique farmland, land use, parks, natural areas, recreational opportunities, or wild and scenic rivers. Due to the extensive previous disturbance of the PAF reservation, these Alternative B and Alternative C actions would have minimal impacts on visual resources, vegetation, wildlife, and state-listed endangered and threatened species, and are not likely to adversely affect federally listed endangered and threatened species. Neither the Alternative B facilities nor the Alternative C CT/CC plant would be sited within the 100-year or 500-year floodplains, consistent with Executive Order (EO) 11988 on floodplain management. The Green River water intake structure constructed under Alternative C would be located within the 100-year floodplain; it is considered a repetitive action under EO 11988 and would not adversely affect floodplain functions or values. Alternative B would result in the filling of a small portion of a low-quality wetland; the resulting impacts would be insignificant. The CT/CC plant and transmission line components of Alternative C would not affect wetlands, and both Alternatives B and C would be consistent with EO 11990 on wetlands.

Relative to the No Action Alternative, Alternative B would result an improvement in air quality due to the reduction in PM and associated HAP emissions. Alternative C would result in significant reductions in emissions of criteria air pollutants and HAPs. Greenhouse gas emissions under Alternative B would continue relatively unchanged, but would be significantly reduced under Alternative C due to the replacement of coal combustion with natural gas combustion.

Fly ash from PAF Units 1 and 2 is currently captured by the flue gas desulfurization systems and transported with scrubber waste to the scrubber sludge complex which drains to the fly ash pond (FAP). The FAP also receives fly ash from Unit 3. Under Alternative B, fly ash would be captured in the PJFF systems and wet-sluiced to the FAP. The volume and chemical composition of the fly ash would remain relatively unchanged and little to no change in impacts to groundwater is anticipated. With the wet-sluicing of fly ash from Units 1 and 2, the volume of wastewater directly entering the FAP would increase and its chemical composition would change. Analysis results show that discharges from the FAP would continue to meet permit

levels, and that the current elevated levels of cadmium and selenium could decrease. No significant impacts to receiving surface waters from the construction and operation of the PJFF systems are anticipated.

Alternative C would result in a significant reduction (55 percent) in the quantities of ash and scrubber waste produced at PAF. Impacts to groundwater under Alternative C would be insignificant and no operational impacts to groundwater are expected. Impacts to surface waters during construction would be minimized by the use of best management practices. Long-term operational impacts to surface waters and to aquatic life would be beneficial due to the elimination of the large volume of water currently withdrawn from the Green River for open-cycle cooling of Units 1 and 2 and the associated reduction in entrainment/impingement impacts (at the intake) and thermal impacts (at the discharge). A much smaller volume of water would be used for plant processes and operation of the closed-cycle cooling tower. Discharges from these operations would be treated in a new on-site process pond; modeling results show the discharge from this pond would meet applicable permit requirements and not adversely affect the receiving streams.

Impacts to transportation during construction and operation under both Alternatives B and C would be insignificant. Noise impacts during construction and operation under both Alternatives would also be insignificant, with little change in the noise environment of sensitive receptors near the PAF reservation. Construction of the natural gas pipeline(s) under Alternative C would result in noise impacts to nearby sensitive receptors; these impacts would be short term and most pipeline work would occur during the day on weekdays.

The natural gas pipeline(s) necessary to provide fuel to the Alternative C CT/CC plant would be constructed and operated by a commercial pipeline company and the route(s) is not known at this time. Based on an analysis of likely routes, TVA has determined that adverse impacts to wetlands, streams and aquatic life, vegetation, wildlife, endangered and threatened species, cultural resources, and managed areas can be minimized. The pipeline route(s) would be the subject of future environmental analyses by the Federal Energy Regulatory Commission and TVA.

Neither Alternative B nor Alternative C would result in disproportionate impacts to minority or low-income populations. Both action alternatives would result in beneficial socioeconomic impacts during facility construction. Following the completion of the Alternative B PJFF systems, the long-term operation of Units 1 and 2 would continue to provide the current direct and indirect employment and other socioeconomic benefits to the local area and the region. Under Alternative C, adverse socioeconomic impacts would occur following the retirement of Units 1 and 2 from the reduced direct and indirect employment necessary to operate the CT/CC plant.

Public and intergovernmental Review

A draft of the EA was issued for public review and comment on August 7, 2013. By the end of the 33-day comment period, TVA received 304 comment submissions. The majority of the comments supported the continued use of coal and operation of Units 1 and 2 (Alternative B). TVA has considered all of the substantive comments it received on the draft EA and has responded to them in the final EA as appropriate. TVA has consulted with the Kentucky State Historic Preservation Office under Section 106 of the National Historic Preservation Act and with

the U.S. Fish and Wildlife Service under Section 7 of the Endangered Species Act. Appropriate recognized Native American tribes were also consulted concerning the proposed undertaking.

Mitigation

TVA would implement the routine and non-routine practices listed in EA for reducing adverse environmental effects from the construction, operation, and maintenance of the proposed facilities. The following nonroutine measures would be applied during construction and operation to reduce the potential for adverse environmental effects.

- TVA will coordinate with the Kentucky Transportation Cabinet, the Muhlenberg County Road Department, and the Town of Drakesboro to minimize potential effects to public roadways during construction.
- Directional boring will be conducted under streams or rivers (under a marked navigation channel or not) for the installation of natural gas pipelines.

Conclusion and Findings

Based on the findings in the EA and summarized above, TVA concludes that the proposed construction and operation of the PJFF systems under Alternative B, as well as the construction and operation of the CT/CC plant under Alternative C, would not be a major federal action significantly affecting the quality of the environment. Accordingly, an environmental impact statement is not required.



November 13, 2013

Charles P. Nicholson, Principal Program
Manager, NEPA Compliance
Tennessee Valley Authority

Date Signed