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Subject: [EXTERNAL] TVA - Cumberland Fossil Plant - TN0005789 - ELG 2023 Annual Report
Date: Thursday, January 25, 2024 3:12:19 PM

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Please see the attached TVA – CUF (NPDES Permit No. TN0005789) - ELG Annual Report for 2023.

Thank you,
Jennifer Winstead



1101 Market Street, Chattanooga, Tennessee 37402

Sent Via Electronic Transmittal

January 25, 2024

Mr. Vojin Janjić (water.permits@tn.gov)
Division of Water Resources
Tennessee Department of Environment
and Conservation
William R. Snodgrass Tennessee Tower
312 Rosa L. Parks Avenue, 11th Floor
Nashville, TN 37243

Dear Mr. Janjić

TENNESSEE VALLEY AUTHORITY (TVA) – CUMBERLAND FOSSIL PLANT (CUF) – NPDES PERMIT NO. TN0005789 – WASTEWATER TREATMENT UPGRADES TO COMPLY WITH EFFLUENT LIMITATION GUIDELINES (ELG) – 2023 ANNUAL REPORT

In accordance with Part I.F. of the subject permit, please find enclosed an annual report detailing TVA's progress toward installing the necessary equipment to meet the wet flue gas desulfurization wastewater and bottom ash transport water ELGS.

If you have questions or need any additional information, please contact Carrie McCarty at (931) 827-6278 or by e-mail at csmccart@tva.gov.

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Sincerely,

A handwritten signature in black ink, appearing to read 'William T. Patterson', is written over a light blue horizontal line.

William T. Patterson
Plant Manager
Cumberland Fossil Plant

Enclosure

Mr. Vojin Janjić
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Wet FGD Wastewater Treatment & Bottom Ash ELG Project Updates

TVA Cumberland Fossil Plant – NPDES permit No. TN0005789

2023 Annual Report

Introduction

Effluent Limitations Guidelines NPDES Permit Requirement and Regulations

Part I.F. of the NPDES permit for Cumberland Fossil (CUF) requires the Tennessee Valley Authority (TVA) to provide the Tennessee Department of Environment and Conservation (TDEC) with an annual report detailing progress achieved during the preceding calendar year as well as identification of upcoming projects needed to attain compliance with EPA's Effluent Limitations Guidelines (ELGs). These update reports are due by January 31 of the following year.

TVA presented information in early 2016 to support a fundamentally different factors (FDF) limits variance for selenium and the monthly average nitrate-nitrite wet flue gas desulfurization (FGD) ELGs to be based on physical-chemical (P-C) treatment alone (i.e., without installing biological equipment). This request was made because TVA believes CUF is fundamentally different from that which EPA considered when establishing the wet FGD ELGs because of the process employed and costs that were substantially higher than what EPA predicted. In support of the FDF, TVA prepared a schedule that showed P-C treatment equipment installed and operational by September 1, 2021, in order to begin gathering data on how effective P-C could be in removing selenium. The CUF NPDES permit incorporated the September 1, 2021, date as the ELG applicability date for arsenic and mercury. The wet FGD selenium (Se) and nitrate-nitrite (N-N) limits are shown in the permit as the same limits as the ELG rule with an applicability date of December 1, 2023. TVA requested an ELG applicability date for no discharge of bottom ash transport water (BATW) of December 1, 2023; TDEC granted that timetable in the NPDES permit issued in 2018. On October 13, 2020, the United States Environmental Protection Agency published revisions to the ELGs in 40 CFR Part 423. The revised rule modifies technology-based effluent limitations for FGD wastewater and BATW. The rule also establishes several new subcategories that provide separate compliance pathways based on unit operation and asset operating plans.

TVA applied for an NPDES permit modification on January 8, 2021, pursuant to the revised ELGs, to incorporate revised limitations based on multiple asset operating scenarios. On May 6, 2021, the TVA Board of Directors held its quarterly meeting during which TVA's Chief Executive Officer discussed planning assumptions for the retirement of TVA's coal fleet by 2035 and announced TVA's intent to prepare an Environmental Impact Statement (EIS) to assess the impacts associated with the proposed retirement of CUF and the replacement generation alternatives. On May 11, 2021, TVA published a Notice of Intent (NOI) for the EIS in the Federal Register.

On May 21, 2021, TVA submitted to TDEC supplemental relevant information for review and consideration in the modified NPDES permit request relevant to the Board's decision to assess closure alternatives for CUF.

On October 6, 2021, TVA submitted a Notice of Planned Participation (NOPP) in the retirement subcategory for FGD wastewater and BATW for the two coal combustion units at CUF. CUF's retirement EIS was published in the Federal Register on December 9, 2022 and a Record of Decision to cease coal combustion at Cumberland was signed January 10, 2023. This decision

aligns with TVA's NOPP for the retirement subcategory of the 2020 ELGs. On August 3, 2021, EPA published a notice of new rulemaking in the Federal Register that proposes revisions to the 2020 ELG rule. When this new rule is promulgated, TVA will respond according to any new compliance requirements and their corresponding applicability dates, in coordination with state regulators.

On October 10, 2023 TDEC issued a draft NPDES permit that included permit updates based on the 2020 ELG rule and TVA's modification request. TDEC held a public hearing for the draft permit on November 16, 2023 to receive comments from the public. TDEC issued a revised NPDES permit on November 30, 2023.

Milestones that either have been completed or would need to be completed to achieve retirement are listed in the table below:

Milestone	Activity	Date Completed
Integrated Resource Plan	TVA posted the final Record of Decision for the 2019 IRP.	September 17, 2019
National Environmental Policy Act (NEPA) Review	TVA Environmental Impact Statement (EIS) to assess the impacts associated with the proposed retirement of CUF and the replacement generation alternatives	December 9, 2022
Decision to Retire CUF	TVA Record of Decision	January 10, 2023
Cessation of Coal Combustion Activities	TVA to cease coal combustion at CUF	On or before December 31, 2028

Wet FGD Wastewater Treatment/Related Projects

Historical Equipment/Systems Description

The existing system for handling wet FGD (gypsum) blowdown at Cumberland Fossil (CUF) includes primary hydrocyclone(s) with underflow going to vacuum belt filters used to dewater gypsum. Dewatered gypsum is marketed for wallboard production at a Georgia Pacific facility adjacent to CUF. Onsite landfill disposal may occur if CUF's gypsum does not meet specifications for wallboard. Gypsum dewatering operations are currently performed by SynMat^R with the effluent going to FGD wastewater treatment (WWT) then to the CUF process water basin for treatment, eventually discharging via Internal Monitoring Point 001. CUF has completed construction of a WWT facility including both fines dewatering and physical-chemical treatment for wet FGD blowdown from the SynMat^R facility.

Previous Wet FGD Activities Summary

SynMat^R facility upgrades: Additional upgrades to incorporate automation with the effluent slurry tanks (ESTs) and gypsum slurry storage tank (SST) was completed in April 2021.

Construction of wet FGD Wastewater Treatment Facility: Stage A commissioning was completed in March 2021 to dewater gypsum fines. Stage B commissioning was completed in May 2021 which will manage total dissolved solids such as arsenic and mercury.

Wet FGD Projects Activities Update

The FGD WWT facility is in operation and TVA will continue to address any warranty and O&M issues. In 2023, TVA executed a limited pilot study of membrane and biologic treatment systems at KIF to evaluate the efficacy of treatment technologies for FGD wastewater.

Bottom Ash Transport Water Related Projects

TVA anticipated issues complying with the no-discharge of BATW ELG that was included in EPA's 2015 ELG rule. Based on TVA's experiences at Bull Run in operating a recirculating system, some amount of blowdown discharge needs to be allowed in order to maintain system chemistry and balance flow volumes in a closed loop. Certain constituents (e.g., chlorides) present in BATW that are not removed by the planned physical-chemical treatment for BATW may "cycle up" or become more concentrated leading to a degradation or failure of the materials of construction. While EPA allows for use of BATW in FGDs or for no discharge uses, flows may still not "balance", depending upon how much flow can be used without impacting scrubber performance. In the 2020 ELGs, EPA replaced the 2015 BATW no-discharge requirement with a requirement that allows the discharge of up to ten percent of the wetted system by volume in certain prescribed situations.

Bottom Ash Activities Update

In 2022, TVA completed a Phase 1 study of the Bottom Ash Recirculation project to meet the 2020 rule. TVA elected to move forward with preliminary engineering for a high recirculation rate system for BATW as a risk mitigation measure for deployment of replacement generation after ELG compliance dates. As EPA moves forward with their new ELG rulemaking, TVA will monitor any updated and/or new requirements, coordinate with state regulators, and respond accordingly for compliance.