**Tennessee Valley Authority**, 1101 Market Street, BR 2C, Chattanooga, Tennessee 37402-2801

September 18, 2019

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

Dear Mr. Janjić:

TENNESSEE VALLEY AUTHORITY (TVA) – SEQUOYAH NUCLEAR PLANT (SQN) – NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT NO. TN0026450 – AMENDED PERMIT APPLICATION – REQUEST TO CONDUCT A PREDICTIVE CLEAN WATER ACT (CWA) SECTION (§) 316(a) DEMONSTRATION

TVA is seeking to amend the existing Alternate Thermal Limit (ATL) for the SQN thermal discharge to include the transition months of October and April, in addition to the ATL that currently exists for November through March. To support this proposal, TVA is requesting the NPDES permit renewal for SQN currently being drafted by TDEC include a provision for TVA to conduct a predictive CWA § 316(a) demonstration study within the first six months of the effective permit term for TDEC review and determination.

Background

TVA conducted a predictive CWA § 316(a) demonstration study in 1989 to support the existing ATL that authorizes a temperature rise in the receiving water (Chickamauga Reservoir) of 5°C measured at the end of a mixing zone established 1,500-ft downstream of the SQN submerged multi-port discharge diffusers during the months of November through March. The state criterion for temperature rise is 3°C; thus, the current ATL represents a 2°C increase. TVA has conducted § 316(a) demonstration/monitoring studies at least every permit renewal cycle since 1989 to ensure that no appreciable harm has resulted to the protection and propagation of a balanced, indigenous population of fish, shellfish, and wildlife (commonly referred to as a BIP) in Chickamauga Reservoir. These studies have formed the basis for the continuance of the ATL in subsequent NPDES permits for SQN for the months of November through March.

Reason for the Request

Originally, the current ATL was sought to avoid incurring significant and costly freeze damage to SQN's natural draft cooling towers during winter months. The ATL has been effective in that regard while also being protective of a BIP in the receiving water.

Since the current ATL was first approved, the plant has faced challenges in achieving the 3°C temperature rise criterion during October and April even with having cooling towers in operation. It is during these two months of transitioning from summer to winter (October) and from winter to summer (April) that ambient conditions in the reservoir, and the positions and hydrological attributes of the upstream and downstream compliance measuring points, combine to create challenges for temperature rise compliance. In the remainder of the year (i.e., May through September), the 3°C temperature rise criterion is maintained under normal operations of the plant without the need for cooling tower use[1].

In reviewing SQN cooling tower use-hours since 2007, average operation of the towers in the transition months of October and April ranges from 26% to 40% of total annual tower operations. This is an excessive amount of cooling tower operations for just two months occurring during a time of generally mild water temperatures in the reservoir. Due to natural seasonal fluctuations in water temperatures occurring during the October and April transitional months, fish are exposed to a wide range of temperatures in the reservoir unrelated to SQN operations. As such, there may be no material benefit provided by operation of the cooling towers during this time (October and April) to ensure the protection and propagation of a BIP.

A predictive CWA § 316(a) demonstration study would be designed to analyze this hypothesis to support a TDEC decision on the requested ATL modification.

Proposed ATL and Supporting Demonstration

TVA proposes to evaluate an ATL for temperature rise of 4°C for the transition months of October and April, just 1°C above the established state criterion of 3°C and 1°C below the currently authorized ATL for November through March of 5°C. We believe such a modest increase during these months will not threaten the protection and propagation of a BIP in Chickamauga Reservoir.

The TDEC General Water Quality Criteria for temperature protective of fish and aquatic life provides that: "A successful demonstration as determined by the Department conducted for thermal discharge limitations under Section 316(a) of the Clean Water Act, (33 U.S.C. §1326), shall constitute compliance with this paragraph" (Chapter 0400-40-03-.03(3)(e)). The state's temperature criteria are water quality-based as opposed to technology-based; that is, application of cooling tower technology is not the basis for the state's temperature criteria, rather the water quality impacts associated with temperature. The predictive CWA § 316(a)

[1] Cooling towers are, however, operated on an as-needed basis during summer months to meet the state criterion for maximum temperature (30.5°C) at the downstream end of the mixing zone as defined in the NPDES permit.

demonstration study will evaluate the water quality impacts associated with the proposed ATL with regard to the protection and propagation of a BIP in Chickamauga Reservoir.

TVA respectfully requests that the NPDES permit renewal for SQN currently being drafted by TDEC include provisions for TVA to conduct a predictive CWA § 316(a) demonstration study within the first six months of the effective permit term. Further, provisions in the renewal permit should provide for the application of the proposed ATL for temperature rise of 4°C for the months of October and April within the permit term should TDEC determine TVA's predictive CWA § 316(a) demonstration study supports such a decision.

If you have questions or need additional information, please contact Travis Markum at (423) 751-2795 or by email at trmarkum@tva.gov.

Sincerely,

Terry E. Cheek

Terry E. Cheek
Senior Manager
Water Permits, Compliance, and Monitoring

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