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Chattanooga, TN

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File: Updated GWPS and SSLs at the Bull  
Run Fossil Plant Fly Ash Stilling Pond  
and Sluice Channel and Main Ash Pond  
Vacatur CCR Units

Date: July 8, 2022

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**Reference: Update on Statistically Significant Levels (SSLs) - CCR Rule Groundwater Monitoring Bull Run Fossil Plant, Fly Ash Stilling Pond and Sluice Channel and Main Ash Pond Vacatur CCR Units**

In accordance with the federal regulations for management of coal combustion residuals (CCR Rule; 40 CFR Part 257, Subpart D), the Tennessee Valley Authority (TVA) is currently conducting Assessment Monitoring at the Fly Ash Stilling Pond and Sluice Channel and Main Ash Pond Vacatur CCR Units at its Bull Run Fossil Plant (BRF) in Clinton, Tennessee. The Fly Ash Stilling Pond and Sluice Channel and Main Ash Pond are subject to the CCR Rule and are monitored by a multiunit groundwater monitoring system.

As required by the CCR Rule, the owner or operator of a CCR unit shall establish groundwater protection standards (GWPS) for Appendix IV parameters detected during Assessment Monitoring and determine if one or more Appendix IV parameters are detected at statistically significant levels (SSLs) above their GWPS. GWPS for all Appendix IV parameters were originally established and documented in a notice dated April 14, 2020, as required by 40 CFR § 257.95(d)(2) and are provided on Table 1.

As part of ongoing Assessment Monitoring, the first semiannual assessment monitoring event for 2022 occurred January 4-7, 2022, with the additional “resample” event occurring February 16-22, 2022. This technical memorandum presents GWPS and lower confidence bands (LCBs) that have been updated with data collected during the first semiannual monitoring event and resample event for 2022, as well as any identified SSLs after incorporating the additional data collected in 2022. The identification of SSLs was performed as a two-step process:

1. Historical sampling results (January 2019 through February 2022) for Appendix IV parameters from each downgradient well were compared directly to the updated GWPS. If sample concentrations were below the updated GWPS, no SSLs over the GWPS were identified.
2. Where the direct comparison indicated a concentration above the GWPS, further statistical analysis was performed to identify levels statistically greater than the GWPS, using procedures recommended in the United States Environmental Protection Agency (USEPA) Unified Guidance for Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities (EPA 530/R-09-007; March 2009). Comparisons were made against a fixed GWPS via LCBs. For each situation where a parameter concentration was greater than the GWPS in step one, the 99% LCB of the fitted line in that monitoring well was calculated using CCR Rule monitoring data collected from January 2019 through February 2022. As recommended in the Unified Guidance, where the 99% LCB exceeds the GWPS at the last sampling event an SSL was identified for the constituent/well pair.

Based on the statistical analysis performed in 2022, there continues to be SSLs above the GWPS for arsenic in well 10-52, for cobalt in wells 48 and 49, for lithium in wells 47, 48 and 49, and for molybdenum in well 49. A new SSL over the GWPS for cobalt in well 47 was identified in 2022 after inclusion of groundwater monitoring data from the first half of 2022. An SSL over the GWPS for arsenic in well 49 was not recorded in 2022 after inclusion of groundwater monitoring data from the first half of 2022. TVA will continue to conduct groundwater monitoring and reporting pursuant to 40 CFR § 257.95.

July 8, 2022

Tennessee Valley Authority

Page 2 of 2

Reference: Update on Statistically Significant Levels at the Bull Run Fossil Plant - Fly Ash Stilling Pond and Sluice Channel and Main Ash Pond Vacatur CCR Units

**TABLE 1: Statistically Significant Levels Above GWPS - BRF Fly Ash Stilling Pond and Sluice Channel and Main Ash Pond**

Appendix IV Parameter	GWPS (a)	Updated GWPS (b)	Downgradient wells with analytical results above GWPS (c)	Updated LCBs (d)	SSL LCB > GWPS (e)
Antimony (µg/L)	6	6	None	NA	NA
Arsenic (µg/L)	10	10	49 <sup>(f)</sup>	0.0	<b>No</b>
			10-52	33	<b>Yes</b>
Barium (µg/L)	2,000	2,000	None	NA	NA
Beryllium (µg/L)	4	4	None	NA	NA
Cadmium (µg/L)	5	5	None	NA	NA
Chromium (µg/L)	100	100	None	NA	NA
Cobalt (µg/L)	6	6	47	6	<b>Yes</b>
			48	22	<b>Yes</b>
			49	11	<b>Yes</b>
Fluoride (µg/L)	4,000	4,000	None	NA	NA
Lead (µg/L)	15	15	None	NA	NA
Lithium (µg/L)	40	40	47	394	<b>Yes</b>
			48	62	<b>Yes</b>
			49	272	<b>Yes</b>
Mercury (µg/L)	2	2	None	NA	NA
Molybdenum (µg/L)	100	100	49	182	<b>Yes</b>
Radium-226+228 (pCi/L)	5	5	None	NA	NA
Selenium (µg/L)	50	50	None	NA	NA
Thallium (µg/L)	2	2	None	NA	NA

NA – Not applicable

- (a) GWPS documented in notice dated April 14, 2020 [reported in micrograms per liter (µg/L)]
- (b) GWPS updated as of June 10, 2022, with two additional sample results collected on January 4-7, 2022, and February 16-22, 2022 [reported in µg/L]
- (c) Downgradient wells with analytical results above GWPS January 2019 through February 2022 (per 40 CFR § 257.95(b) and (d))
- (d) Most recent value of 99% lower confidence band (LCB) on the mean of Appendix IV groundwater sampling events between January 2019 and February 2022. Upper confidence band (UCB) not shown as it is greater than LCB.
- (e) SSL: “statistically significant level over GWPS” occurs when the updated LCB value at the last sampling event exceeds the updated GWPS
- (f) Negative lower confidence bands were reported as 0.0 µg/L