Cumberland Fossil Plant

CUMBERLAND CITY, TENNESSEE

EPA CCR Rule Groundwater Monitoring

This fact sheet summarizes groundwater monitoring conducted by TVA for the Cumberland Fossil Plant, as required by the U.S. Environmental Protection Agency (EPA) Coal Combustion Residuals (CCR) Rule. The EPA published the CCR Rule on April 17, 2015. It requires companies operating coal-fired power plants to study whether constituents in CCR have been released to groundwater from active, inactive and new CCR impoundments, as well as active and new CCR landfills.

The CCR Rule establishes multiple phases of protective groundwater monitoring including baseline sampling, Detection Monitoring and Assessment Monitoring. Corrective action may be necessary at the completion of this process. For more information on the CCR Rule Groundwater Monitoring requirements, go to www.tva.com/ccr.

Cumberland Plant CCR Rule Groundwater Monitoring Network

In addition to ongoing groundwater monitoring required under State regulations, TVA installed additional wells around the CCR management units, as needed, and TVA implemented a baseline sampling program. After completion of baseline sampling, TVA began Detection Monitoring. The constituents specified by the CCR Rule for Detection Monitoring are boron, calcium, chloride, fluoride, pH, sulfate, and total dissolved solids (TDS). These seven constituents can occur naturally in soils, rock, groundwater and surface water, and can also be present in coal and CCR. They were selected by EPA because they can indicate groundwater conditions that may require further evaluation.

QUICK FACTS

Commissioning Date: 1973

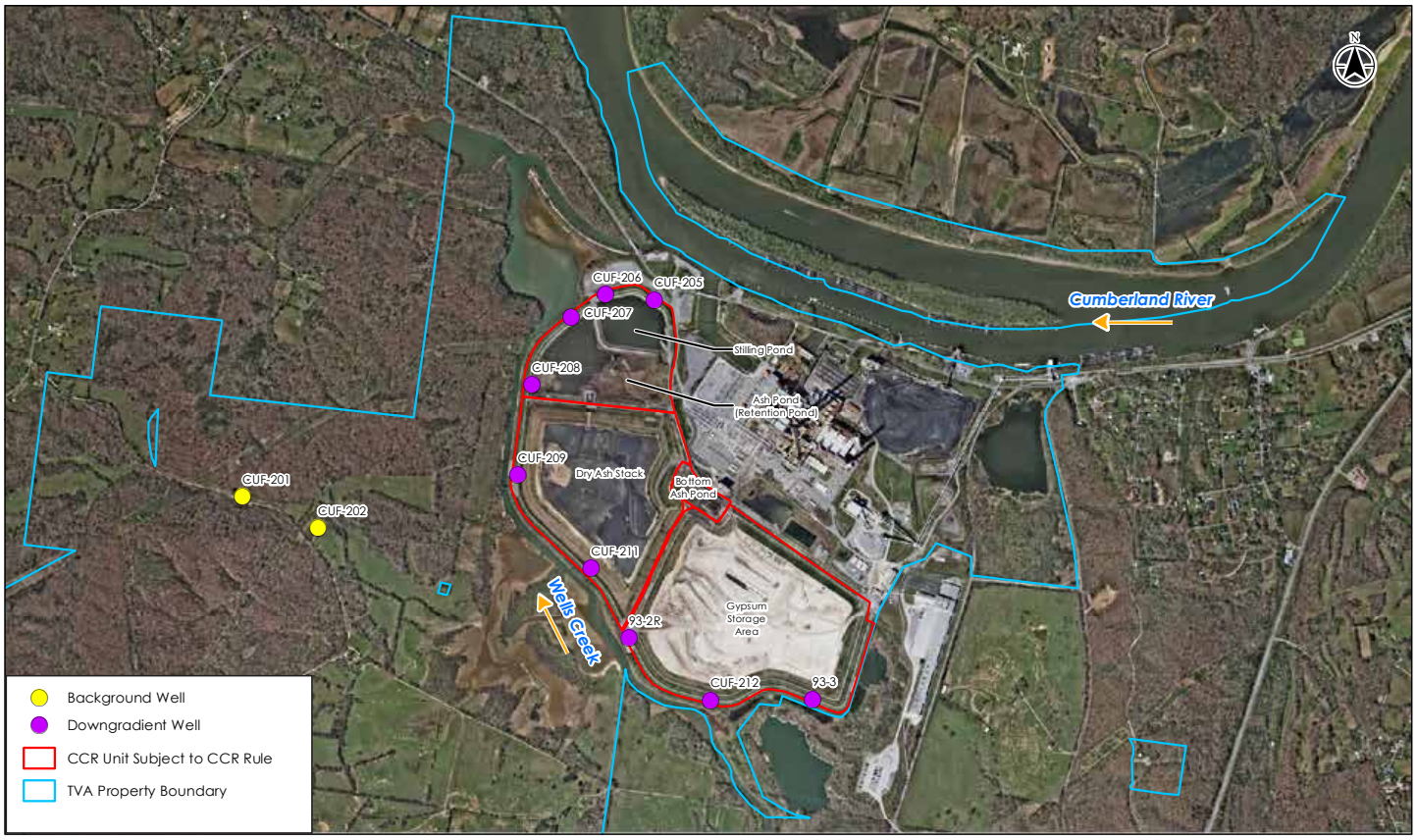
Output: 2,470 Megawatts (16 billion kilowatt-hours)

Number of homes powered: 1.1 Million

Wet to Dry / Dewatered Conversion Program: Activities underway

TVA Wide CCR Conversion Program Total Spend: Approximately $1.3 Billion

TVA installed “background”, or upgradient, wells in locations that are not expected to be affected by the management of CCR. Other wells were drilled around the edge of the areas where CCR is managed or already existed and were being monitored. These wells are sometimes referred to as “downgradient wells” and placed in locations to monitor for releases to groundwater. The locations of the wells are shown below.



CCR Rule Detection Monitoring Results for Cumberland Fossil Plant

TVA prepared its initial **2017 Annual Groundwater Monitoring and Corrective Action Reports** for the Cumberland Fossil Plant, which analyzed the Detection Monitoring results to determine if there were statistically significant increases (SSIs) over background levels. The report was posted publicly March 2, 2018, and can be found by clicking on the following hyperlink www.tva.com/ccr. The initial comparison of downgradient wells to upgradient wells showed that concentrations of boron, calcium, chloride, sulfate and TDS around the CCR management units may be greater than naturally occurring levels. Data does not reflect the quality of public drinking water supplies, which are regularly tested to confirm they are meeting safe drinking water standards.

2018 Groundwater Monitoring Activities

Since the initial groundwater monitoring results identified SSIs, TVA conducted alternate source demonstrations to determine if the exceedances were the result of another source or the result of an error in the sampling or analytical method, or natural variability in groundwater quality. No alternate source was determined resulting in the facility moving into the Assessment Monitoring phase. The groundwater sampling for this phase is expanded to test for additional constituents, for which TVA has determined groundwater protection standards (GWPS), including antimony, arsenic, barium, beryllium, cadmium, chromium, cobalt, fluoride, lead, lithium, mercury, molybdenum, radium, selenium and thallium.

Cumberland Fossil Plant CCR Rule Assessment Monitoring Results

The Assessment Monitoring results are contained in the **2018 Annual Groundwater Monitoring and Corrective Action Reports**. The reports can be found at www.tva.com/ccr. Below is the Cumberland Assessment Monitoring Results Matrix, which is based on comparative analysis of statistical analysis results versus GWPS. Refer to Appendix A – Statistical Analysis Report of the 2018 Annual Groundwater Monitoring and Corrective Actions Reports for more information.

		GROUNDWATER QUALITY MONITORING WELL LOCATIONS										
		Background Wells		Dry Ash Stack and Gypsum Storage Area					Stilling and Retention Pond			
Constituent	**GWPS mg/L**	**CUF-201**	**CUF-202**	**CUF-209**	**CUF-211**	**93-2R**	**CUF-212**	**93-3**	**CUF-205**	**CUF-206**	**CUF-207**	**CUF-208**
Antimony	0.006	●	●	●	●	●	●	●	●	●	●	●
Arsenic	0.01	●	●	●	●	●	●	●	●	●	●	●
Barium	2	●	●	●	●	●	●	●	●	●	●	●
Beryllium	0.004	●	●	●	●	●	●	●	●	●	●	●
Cadmium	0.005	●	●	●	●	●	●	●	●	●	●	●
Chromium	0.1	●	●	●	●	●	●	●	●	●	●	●
Cobalt	0.006	●	●	●	●	●	●	●	●	●	●	●
Fluoride	4	●	●	●	●	●	●	●	●	●	●	●
Lead	0.015	●	●	●	●	●	●	●	●	●	●	●
Lithium	0.04	●	●	●	●	●	●	●	●	●	●	●
Mercury	0.002	●	●	●	●	●	●	●	●	●	●	●
Molybdenum	0.1	●	●	●	●	●	●	●	●	●	●	●
Rad226+228	5 pCi/L	●	●	●	●	●	●	●	●	●	●	●
Selenium	0.05	●	●	●	●	●	●	●	●	●	●	●
Thallium	0.002	●	●	●	●	●	●	●	●	●	●	●

Color Coding Key

- ● Monitoring data results are below GWPS
- ● Monitoring data results are below GWPS, but results are 65% or more of the GWPS
- ● Monitoring data results exceed GWPS (TVA will initiate assessment of corrective measure)

Next Steps for Cumberland Fossil Plant CCR Rule Groundwater Monitoring

TVA will continue to monitor and evaluate the groundwater at the Cumberland Fossil Plant site. In January 2019, TVA completed an evaluation of whether there were exceedances of GWPS detected at the Bottom Ash Pond, Dry Ash Stack, Gypsum Storage Area (which has a multi-unit groundwater monitoring well network) and the Stilling Pond (including Retention Pond). During assessment monitoring, three SSLs of Appendix IV constituents were reported above GWPS in downgradient monitoring wells. TVA has since completed an Assessment of Corrective Measures Report to analyze the potential effectiveness of potential corrective measures. This report will be posted to the CCR website on August 14, 2019. A semiannual report describing the progress in selecting and designing the final remedy will be completed in January 2020.