

June 13, 2018

Tennessee Valley Authority  
1101 Market Street  
Chattanooga, Tennessee 37402

**Groundwater Monitoring System, Revision 1  
North Rail Loop Landfill  
TVA Gallatin Fossil Plant  
Gallatin, Tennessee**

**1.0 Introduction**

This letter documents AECOM's updated certification of the groundwater monitoring system for the Tennessee Valley Authority (TVA) Gallatin Fossil Plant North Rail Loop (NRL) Landfill. The monitoring system was originally certified on October 16, 2017; this update reflects the addition of a new well to the system. Based on the information evaluated by AECOM, the groundwater monitoring system, first year baseline monitoring phase of TVA's Coal Combustion Residuals (CCR)-Rule Groundwater Quality Monitoring Program, meets the performance standard specified in the Final CCR Rule at 40 CFR § 257.91.

**2.0 Summary of Findings**

In establishing the groundwater monitoring system for the NRL Landfill at the Gallatin Fossil Plant in Gallatin, Tennessee, AECOM developed a hydrogeologic characterization of the site, designed and reviewed the installation of the monitoring wells, and evaluated available groundwater data. Based upon review of the available information, the groundwater monitoring system at the NRL Landfill meets the performance standard specified in 40 CFR § 257.91, based on the following criteria:


- There are a sufficient number of wells installed at appropriate locations and depths to yield groundwater samples that accurately represent the quality of background groundwater unaffected by CCR and the quality of groundwater at the downgradient waste boundary (257.91(a)(1) and (2)).
- The wells provide samples from the uppermost aquifer (257.91(a) and 257.53).
- The system contains four background wells (GAF-412L, GAF-414L, GAF-426L, GAF-427L) representing conditions unaffected by CCR (257.91(a)(1) and (c)(1)).
- The system contains one well located upgradient of the NRL Landfill (NRL221).
- The system contains five wells located downgradient of the NRL Landfill Cell 1 and future Cells 2 and 3 (NRL015, NRL220, NRL227, NRL230, and NRL301B) to monitor groundwater near the waste boundary (257.91(a)(2) and (c)(1)).

- Wells are constructed appropriately (257.91(e)).

At the NRL Landfill, Cell 1 has been constructed and is currently receiving CCR's. The hydraulic gradient in the Lebanon Limestone, below the NRL Landfill, is toward the east and southeast. On the east side of Cell 1, drilling of four exploratory boreholes (NRL219, NRL228, NRL231, NRL232) at locations shown in Figure 1 between 2011 and 2107 did not encounter the water bearing zone in the Lebanon Limestone or had very poor yield in this area. Well NRL301B was installed at a fifth location in this area (Figure 1), and the well has very poor yield, confirming the lack of groundwater flow. Groundwater flow in the Lebanon Limestone is estimated to flow around and not through this localized area of low permeability on the east side of the landfill. The groundwater monitoring system is based on site-specific hydrogeologic conditions including the lack of water-bearing fracture zones in the Lebanon Limestone on the east side of the landfill (257.91(b)).

### 3.0 Qualified Professional Engineer Certification

I, Gabriel W. Lang, PE, being a Registered Professional Engineer in good standing in the State of Tennessee, do hereby certify, to the best of my knowledge, information, and belief that the information contained in this certification is prepared in accordance with the accepted practice of engineering; that the information contained herein is accurate as of the date of my signature below; and that the design and construction of the groundwater monitoring system as described above meets the requirements of 40 CFR § 257.91. Opinions relating to environmental, geologic, and hydrogeologic conditions or other estimates are based on available data; actual conditions may vary from those encountered at the times and locations where data are obtained, despite the use of due care.

SIGNATURE: 

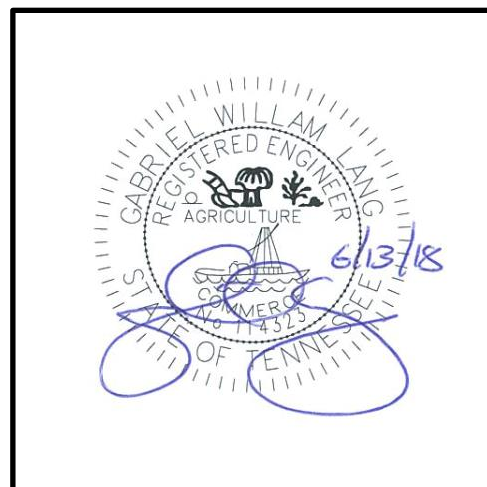
DATE: June 13, 2018

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Attachments:  
Figure 1 – CCR Rule Monitoring System Plan  
Table 1 – Well Construction Information

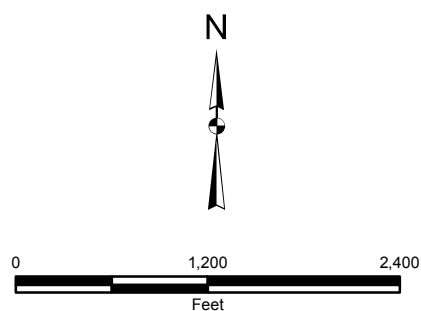






**LEGEND**

- CCR Rule Monitoring System Wells
- Drilled borehole in Lebanon Limestone - not water-bearing
- TVA Gallatin Fossil Plant Property Boundary (Approximate)
- North Rail Loop (NRL) Landfill



NOTE: Aerial image dated February 2017

**AECOM**

**Figure 1**

**CCR RULE MONITORING SYSTEM  
NORTH RAIL LOOP (NRL) LANDFILL**

DRAWN BY: MARK.P.SMITH	REVIEWED BY: C.GARLINGTON	APPROVED BY:	REVISION NUMBER: REV. 1
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**GALLATIN FOSSIL PLANT  
TENNESSEE VALLEY AUTHORITY**

DATE: 6/13/2018	DEPT: FOSSIL AND HYDRO ENGINEERING
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**TABLE 1**  
**WELL CONSTRUCTION INFORMATION**  
**CCR RULE GROUNDWATER MONITORING SYSTEM**  
**NORTH RAIL LOOP (NRL) LANDFILL**  
**TVA GALLATIN FOSSIL PLANT**

Well ID	UNID #	Position Relative to CCR Unit	Top of Casing Elevation (ft)	Ground Elevation (ft)	Screened Interval (ft btoc)	Screened Formation	Total Well Depth (ft btoc)	Pump Intake Depth (ft btoc)	Well Diameter (in) / Material	Well Co-ordinates	
										TN State Plane NAD27 Northing (ft)	TN State Plane NAD27 Easting (ft)
GAF-412L	GAF-00-GW-43-019	Background	477.58	473.7	109.5 - 129.5	Lebanon Limestone	129.5	123	4-in PVC	710929.65	1880028.63
GAF-414L	GAF-00-GW-43-021	Background	481.45	478.6	93.2 - 103.2	Lebanon Limestone	103.2	98	4-in PVC	710438.90	1880406.55
GAF-426L	GAF-00-GW-43-030	Background	506.83	502.6	176.7 - 186.7	Lebanon Limestone	187.0	183	2-in PVC	711281.94	1881642.00
GAF-427L	GAF-00-GW-43-032	Background	488.41	484.2	144.4 - 159.4	Lebanon Limestone	159.9	152	4-in PVC	710606.97	1882087.73
NRL015	GAF-00-GW-43-042	Downgradient	546.65	543.7	179.3 - 189.3	Lebanon Limestone	189.6	183	2-in PVC	704590.08	1882451.92
NRL220	GAF-00-GW-43-044	Downgradient	502.54	500.0	164.1 - 184.1	Lebanon Limestone	184.5	175	2-in PVC	704404.76	1884141.74
NRL221	GAF-00-GW-43-045	Upgradient	478.90	476.0	114.4 - 134.4	Lebanon Limestone	134.6	124	2-in PVC	705358.12	1881484.59
NRL227	GAF-00-GW-43-046	Downgradient	560.33	557.2	184.7 - 194.7	Lebanon Limestone	195.2	188	2-in PVC	704219.32	1883458.71
NRL230	GAF-00-GW-43-052	Downgradient	511.70	507.8	161.8 - 181.8	Lebanon Limestone	182.0	165	4-in PVC	705842.44	1883858.33
NRL301B	GAF-00-GW-43-048	Downgradient	498.15	495.3	140.0 - 170.0	Lebanon Limestone	170.2	168	2-in PVC	705244.23	1884140.36

**Notes:**

Elevation information from DDS Survey; elevation in National Geodetic Vertical Datum 1929.

Well co-ordinates based on North America Datum of 1927

Well construction information based on data provided by TVA Well Inventory, April 5, 2018.

CCR - coal combustion residual(s)

ft btoc - feet below top of casing

in - inches (inside diameter)