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VIA U.S. Mail & Email Greg.parker@shelbycountyttn.gov

Greg Parker
Supervisor, Water Quality Branch
Shelby County Health Department
814 Jefferson Avenue, 4th Fl., Room 438
Memphis, TN 38105

Re: Tennessee Valley Authority's Expiring Water Well Permits

Dear Mr. Parker,

On behalf of Protect Our Aquifer and the Tennessee Chapter of the Sierra Club (Conservation Groups), we write to ask that the Shelby County Health Department (Department) both decline to renew and expressly revoke the five water well permits issued to the Tennessee Valley Authority (TVA) for its Allen Combined Cycle Natural Gas Plant (Combined Cycle Plant).

According to the recently amended Shelby County Well Construction rules,¹ TVA's five water well permits should not be re-issued. The rules instead provide that the Department should revoke TVA's permits to withdraw water from the Memphis Sand Aquifer because the wells are sited within a half-mile of remediation investigations involving groundwater contamination and thus put the community's drinking water aquifer at risk. Moreover, during the past year, as a result of state and federal remedial investigations which produced additional evidence of migrating groundwater contamination, TVA began buying water for the Combined Cycle Plant from Memphis Light, Gas, & Water (MLGW) and constructed on-site storage tanks for back-up and peak-demand use. As such, TVA has demonstrated that an alternative source to the water wells exists, which is a stand-alone basis for revoking TVA's permits. Finally, if the wells are to be used for monitoring in the ongoing remediation investigations and so qualify under the rules, the Department could consider issuing TVA's permits as monitoring permits, not re-issuing water production permits.

Background

In the summer of 2017, the Tennessee Department of Environment and Conservation (TDEC) publicly disclosed that groundwater under TVA's East Ash Pond at the Allen Fossil Plant (Coal Plant) was exceeding the groundwater protection standard for arsenic by more than 300 times, as well as standards for lead and fluoride.

¹ The Shelby County Well Construction Code was recently amended, and the changes took effect November 1, 2018. **Att. 1**, Shelby County Well Construction Code (Nov. 2018).

Alarmed by the high levels of a cancer-causing toxin, TDEC required TVA to perform an expedited investigation (State Remedial Investigation) with a particular focus on the potential for contaminated groundwater to be pulled into the Memphis Sand Aquifer, the primary drinking water source for the City of Memphis and Shelby County.² As part of the State Remedial Investigation, TVA engaged the United States Geological Survey (USGS) and the University of Memphis Center for Applied Earth Science and Engineering Research (CAESER) to conduct a pumping test that would evaluate the hydraulic connectivity between the shallow, contaminated aquifer and the Memphis Sand Aquifer. After months of delay, TVA submitted the State Remedial Investigation to TDEC in March 2018.³

The USGS/CAESER portion of the State Remedial Investigation, which was subsequently independently published by USGS and CAESER, concludes that the shallow, contaminated groundwater is connected to the Memphis Sand Aquifer.⁴ The report further found that operating the water wells at the Combined Cycle Plant caused drawdown in the shallow, contaminated aquifer.⁵ Based on these results, TVA has proposed an interim remedial action to begin removing arsenic from the shallow groundwater.⁶ Additional remedial activities are anticipated at the Coal Plant, including the potential closure of the East Ash Pond by removing the coal ash.⁷

More recently, Conservation Groups independently reviewed data from the State Remedial Investigation and the USGS/CAESER report, which demonstrates, among other things, that if there were a continuous barrier between the aquifers the drawdown would be zero, and that the areal extent of the breach in the confining layer that is causing the hydraulic connection may be much larger than the USGS/CAESER report initially indicated.⁸

² **Att. 2**, Letter from Steve Goins, TDEC, to TVA (July 18, 2017) (outlining requirements for remedial investigation) [hereinafter “TDEC Letter re: RI Requirements”].

³ **Att. 3**, Stantec, Draft TVA Allen Fossil Plant-East Ash Disposal Area-Remedial Investigation Report (March 6, 2018) [hereinafter “State Remedial Investigation Report”].

⁴ **Att. 4**, Preliminary Evaluation of the Hydrogeology and Groundwater Quality of the Mississippi River Valley Alluvial Aquifer and Memphis Aquifer at the Tennessee Valley Authority Allen Power Plants, Memphis, Shelby County, Tennessee (2018) [hereinafter “USGS Report”].

⁵ *Id.* at 1, 9.

⁶ **Att. 5**, Initial Remedial Design - Interim Response Action (July 20, 2018).

⁷ **Att. 6**, TVA, Notice of Intent, Environmental Impact Statement for Allen Fossil Plant Ash Impoundment Closures, 83 Fed. Reg. 61,708 (Nov. 30, 2018) [hereinafter “Scoping Notice”]; **Att. 7**, U.S. Securities and Exchange Commission, Form 10-K, at 69 (Sept. 30, 2018), <http://www.snl.com/irw/Doc/4063363/Index?did=48033155>.

⁸ **Att. 8**, Letter from Amanda Garcia, Southern Environmental Law Center, on behalf of Protect Our Aquifer and Sierra Club, to TDECorder@tva.gov, re: Tennessee Department of Environment and Conservation Commissioner’s Order: Environmental Investigation Plan, Revision 2, Allen Fossil Plant (Nov. 28, 2018) [hereinafter “POA/SC Comments on EIP”], submitted together with Douglas J. Cosler, Risk of Contamination of the Memphis Sand Aquifer, Allen Fossil and Combined-Cycle Combustion Turbine Plants: Review and

In addition to the State Remedial Investigation, TVA has also placed the East Ash Pond in assessment monitoring under the federal Coal Ash Rule.⁹ Pursuant to guidance issued by the U.S. Environmental Protection Agency (EPA), as part of its ongoing groundwater investigation, by January 14, 2019, TVA must determine whether it must take corrective action for exceedances of Appendix IV contaminants.¹⁰ Arsenic, lead, and fluoride are all Appendix IV pollutants that trigger corrective action to remedy the contamination.¹¹

Finally, the ash ponds at the Coal Plant are also subject to an administrative order issued by the Commissioner of TDEC that requires TVA to conduct environmental investigations at each of its coal fired power plants in Tennessee, determine the scope of contamination of state waters caused by coal ash storage units, and develop remedial plans.¹² The State Remedial Investigation has, to some extent, been incorporated into this broader remedial process.

Earlier this year, TVA implicitly acknowledged the high levels of coal ash contamination emanating from the Coal Plant, when it publicly announced its decision not to operate production wells at the Allen Combined Cycle Plant that would have likely (more quickly) pulled contaminated groundwater into the Memphis Sand Aquifer. Instead, TVA has been purchasing water from MLGW, which in turn extracts Memphis Sand Aquifer water from the Davis well field.

TVA's Water Well Permits

In the midst of these groundwater contamination investigations at the Coal Plant, TVA applied for and received water well permits from the Department for the Combined Cycle Plant. TVA's five water well permits were re-issued on January 1, 2018. With these permits, the Department granted TVA "permission to maintain [the five specified] well[s] in the City of Memphis or Shelby County, Tennessee for a period of one year in accordance with the rules and regulations adopted by the Ground Water Quality Control Board for Shelby County."¹³ Under the new rules, TVA's water well permits should not be renewed for 2019. TVA's permits should, instead, be revoked.

Analysis of the Environmental Investigation Plan, Remedial Investigation, and Interim Remedial Action (Nov. 26, 2018) [hereinafter "Cosler Report"].

⁹ **Att. 9**, TVA, Notice of Establishment of an Assessment Monitoring Program (Allen Fossil Plant; East Ash Disposal Area).

¹⁰ **Att. 10**, Letter from U.S. EPA to Edison Electric Institute & Venable LLP re: Coal Combustion Residuals Rule Groundwater Monitoring Requirements (Apr. 30, 2018).

¹¹ See Appendix IV to 40 C.F.R. Part 257.

¹² **Att. 11**, Tennessee Department of Environment and Conservation, In the Matter of Tennessee Valley Authority, Order No. OGC15-0177, Sec. VII.A.d (Aug. 6, 2015) [hereinafter "Commissioner's Order"]. The Commissioner's Order does not apply to the Gallatin Fossil Plant, which is the subject of litigation.

¹³ **Att. 12**, Shelby County Health Department Water Quality Branch Water Well Permits, TVA Well Nos. 1, 2, 3, 4, 5 (Jan. 1, 2018).

1. Shelby County’s rules govern existing wells and authorize the Department to revoke well permits to protect public health.

The Shelby County Ground Water Quality Control Board (Board) rules are designed to safeguard public health and protect groundwater.¹⁴ As such, they set forth the “*minimum requirements*” governing the location and use of water wells, and provide that “[n]o person shall conduct any activity contrary to the provisions of these regulations.”¹⁵

According to the rules, an applicant must obtain a written permit prior to well construction and the permit must be “renewed annually to operate or maintain a commercial or industrial well regardless of the intended usage of said well.”¹⁶ Well permits may be revoked (1) “upon the violation by the holder of any terms of the permit or these Rules and Regulations”; or (2) “in any emergency when, in the judgment of the Department, the continued operation of the well, for any reason, shall constitute a health hazard.”¹⁷

Existing wells must “conform to the provisions of these Rules and Regulations” when the rules “relate to” (1) improperly maintained wells, (2) wells constructed in such a way that create serious health hazards, and (3) any other items deemed necessary by the Department.¹⁸

2. TVA’s well water permits and the county’s groundwater rules.

TVA is violating the terms of its permits because it is not maintaining its wells in accordance with the county’s rules and regulations, and it is in violation of or not confirming to the county’s groundwater rules. Specifically:

- Water production wells “cannot be sited or placed in service within a half-mile of the designated boundaries of a mandated or voluntary remediation site involving groundwater contamination or potential contamination, unless the applicant can make a demonstration that the well will not enhance the movement of contaminated groundwater or materials in or into the aquifer.”¹⁹ The Department may determine

¹⁴ Shelby County Well Construction Code, § 1.03.

¹⁵ *Id.* § 1.02(A) (emphasis added).

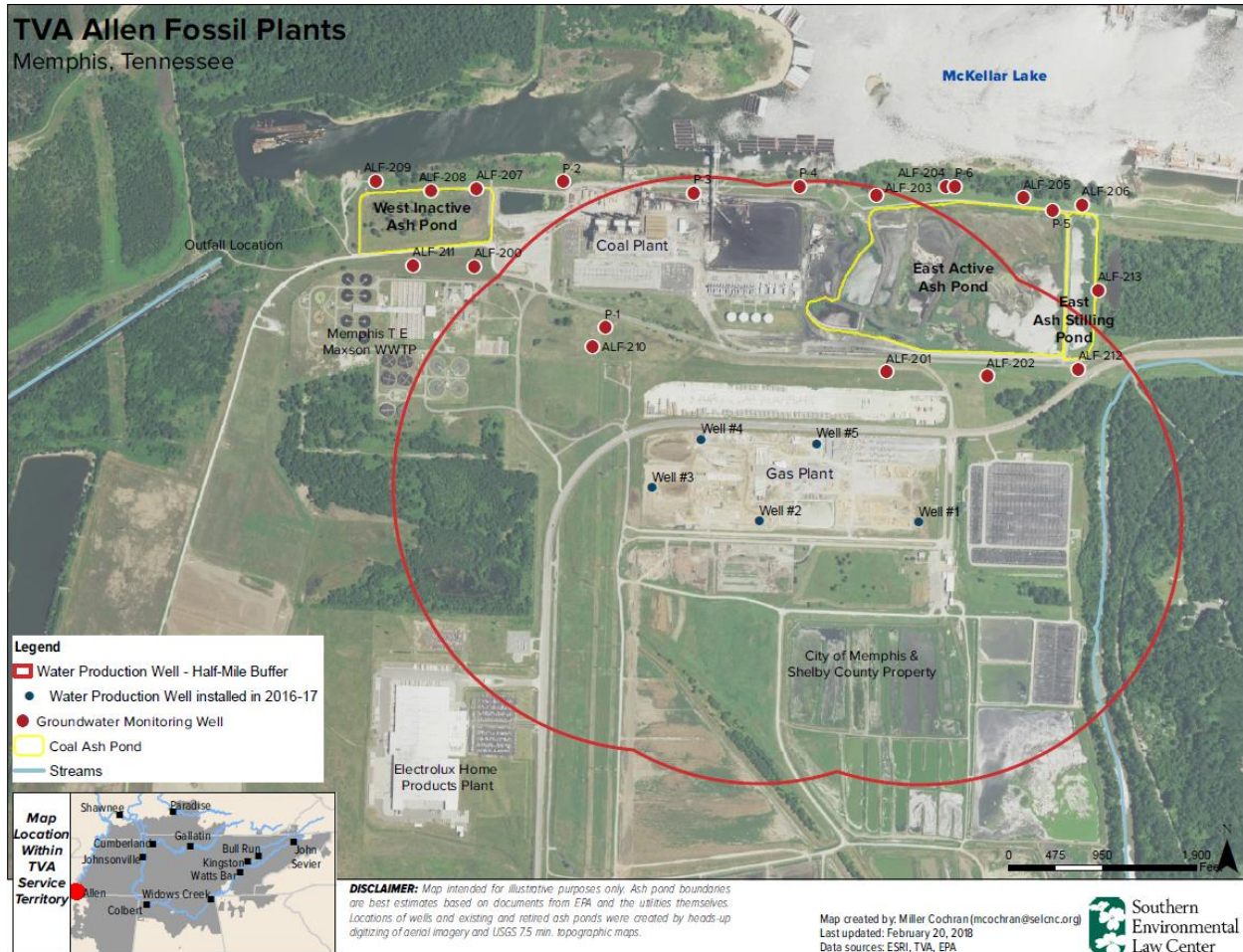
¹⁶ *Id.* § 4.02(E).

¹⁷ *Id.* § 4.02(H).

¹⁸ *Id.* § 14.01.

¹⁹ *Id.* § 5.02(E). *See also id.* § 4.01(C) (“A water well cannot be sited or placed in service within a half-mile of the designated boundaries of a mandated or voluntary remediation site involving groundwater contamination or potential contamination, unless the applicant can make a demonstration that the well will not enhance the movement of contaminated groundwater or materials into the aquifer. Existence of contamination or potential contamination is to be determined by contacting the Tennessee Department of Environment and Conservation (TDEC) Memphis Field Office and requesting a list of impacted sites or TDEC sites within a half mile radius of the potential well location.”).

whether there is actual or potential contamination by reviewing available information.²⁰ There can be no question that TVA's water wells are within a half-mile of a mandated remediation site(s)²¹ because of the State Remedial Investigation and ongoing groundwater investigation and/or remediation at the Coal Plant. In addition, as a result of TVA's groundwater investigation required by the federal Coal Ash Rule, corrective action under the federal Coal Ash Rule appears imminent. According to the following map, the boundaries of the investigations into the Allen Coal Plant's groundwater contamination appear to be within a half-mile of the water wells:



Nor can TVA reasonably demonstrate that the wells will not enhance movement of the coal ash constituents into the aquifer. The USGS/CAESER portion of the State Remedial Investigation concludes that the shallow, contaminated groundwater is

²⁰ *Id.* § 5.02(E).

²¹ *Id.* § 3.34 (“Mandated Remediation Site: Any property or groups of properties at which groundwater investigation or remediation is required by a local, state or federal agency.”).

connected to the Memphis Sand Aquifer, and that using the wells causes drawdown of the contaminated shallow groundwater.

- Wells must be “maintained in a condition whereby they are not a hazard to health or environment nor a source of potential contamination to the groundwater aquifers.”²² Unfortunately, TVA’s water wells connect the uppermost aquifer, which is contaminated, to the Memphis Sand Aquifer, necessarily constituting a health hazard, a hazard to the environment, and a source of potential groundwater contamination.
- Wells are not permitted “where public water is available and which said water supply has a capacity to provide the quantity of water which the user has stated is necessary for purposes for which the water is intended to be used, unless otherwise provided by this code.”²³ TVA is currently purchasing the cooling water it needs (3.5 million gallons per day, on average), from MLGW.²⁴ TVA also recently completed a 5-million gallon on-site storage system (two 2.5 million gallon tanks), which can be used for backup or when the Combined Cycle Plant is operating at or near capacity for extended periods.²⁵ It was reported that TVA’s CEO expressed regret for pursuing the water wells in the first place: “‘Frankly, if I had it to do-over, I would do something else,’ Johnson said of TVA’s decision to drill into the Memphis Sand Aquifer directly to cool its \$975 million natural gas-fired power plant instead of buying water from MLGW, its largest customer.”²⁶ The utility should not be permitted to maintain the well permits and unilaterally reverse course without Department and public oversight.
- “A well may be approved by the Department for construction on a commercial and/or industrially zoned premise where public water is available, provided the owner demonstrates to the Department that no reasonable alternative water supply to the proposed well exists. The potable water supply shall be obtained from the public water system.”²⁷ Even if TVA were not purchasing water from MLGW, TVA’s well

²² *Id.* § 5.06(C). For monitoring and recovery wells, “The borehole shall not hydraulically connect separate aquifers.” *Id.* § 6.03(H). Monitoring and recovery wells shall be maintained “in a condition whereby they are not a hazard to health or environment nor a source of contamination to the groundwater aquifers.” *Id.* § 6.06(B).

²³ *Id.* § 12.01(H). *See also id.* § 3.03 (“Adequate Public Water Supply: A determination by the public water utility serving a location, that it can currently supply, or can and will make the necessary system upgrades, to supply the quantity of water determined by a private user needed for their use.”).

²⁴ **Att. 13**, Tom Charlier, *TVA absorbing higher costs to cool new Memphis power plant*, Memphis Commercial Appeal (July 6, 2018).

²⁵ *Id.*

²⁶ Michelle Colbet, *TVA CEO regrets Memphis aquifer decision*, Memphis Business Journal (Jan. 24, 2018), <https://www.bizjournals.com/memphis/news/2018/01/24/tva-ceo-regrets-memphis-aquifer-decision.html>.

²⁷ Shelby County Well Construction Code, § 12.02(J).

should not be approved for renewal because an additional alternative exists: TVA could use graywater from the adjacent wastewater treatment plant. Using graywater was, in fact, TVA's first proposal, and it was only rejected by TVA as economically disfavored rather than technologically infeasible.

- Wells must be located 100 feet from “any identifiable sources of contamination such as but not limited to disposal fields, seepage pits, manure piles, barns, underground fuel tanks, petroleum or other chemical pipeline, etc.”²⁸ “Contamination” means both actually harmful and “potentially injurious” alternations of water quality.²⁹ Given the breadth of data generated pursuant to the remedial investigations, the Department may be able to confirm that TVA's water wells are too close to sources of actual or potentially injurious contamination.

3. Operation of the wells as a health hazard.

Well permits may be revoked or not renewed even if they are not in strict violation of the rules. Well permits may be revoked in any emergency when the continued operation of the wells constitutes a health hazard.³⁰ Under the rules, an emergency means “unforeseen circumstances that exist beyond the control of the applicant.”³¹

Re-authorizing TVA to pump millions of gallons of water each day in such close proximity to sources of contamination should constitute a health hazard under the rules. TVA knew or should have known that its legacy coal ash contamination was putting the Memphis Sand Aquifer at risk. Even if that was arguably an unforeseen circumstance when the water well permits were initially issued, that can no longer be true. Substantial evidence demonstrates that the risk of Memphis Sand contamination could be exacerbated by TVA's operation of the water wells. That should not be allowed to occur.

4. TVA cannot maintain permits to operate water wells by claiming that they are currently functioning as monitoring wells.

The rules authorize many types of wells, including water wells, observation wells, and monitoring wells. Permits are issued for “the specific activity set forth in the document.”³² TVA's five permits are for “water wells,”³³ which are defined as wells constructed for the

²⁸ *Id.* § 5.02(A)(5).

²⁹ *Id.* § 3.17 (“Alteration of the physical, chemical, or biological quality of the water so that it is harmful or potentially injurious to the health of the users or for the intended use of the water.”).

³⁰ *Id.* § 4.02(H).

³¹ *Id.* § 3.24.

³² *Id.* § 3.40.

“primary purpose of producing a supply of water.”³⁴ Therefore, TVA could not claim that its water well permits should be re-issued because they are or being used as monitoring wells in the State Remedial Investigation or other groundwater investigations.

Observation wells³⁵ and monitoring wells³⁶ can be temporarily abandoned when used for an investigation or research.³⁷ There is no similar provision for water wells or contingency for water productions wells not in use. Therefore, the rules do not allow TVA to operate its water well as monitoring wells.

If the Department is not willing to revoke TVA’s water well permits because it takes the position that the wells are useful for the ongoing remediation investigations, the Department should at least change the water well permits to monitoring well permits. That change will prevent TVA from possessing the unilateral authority to tap the aquifer for a water supply for the Combined Cycle Plant, if TVA desires to do so at some point in the future.

Conclusion

TVA’s wells either do not “conform to”³⁸ or “violate”³⁹ several of the Department and Board’s rules. These violations are not technical and inconsequential. As it stands, TVA is maintaining and reserving the right to operate water wells in close proximity to known contamination while there is a viable alternative water source. That right should be revoked.

We respectfully request to be immediately notified when the Department takes any action on TVA’s water well permits.

Sincerely,



Amanda Garcia
Anne Passino
Southern Environmental Law Center

³³ See Att. 11; **Att. 14**, *Sierra Club et al. v. Shelby County Groundwater Quality Control Board, et al.*, No. 2:17-cv-02114-SHL-dkv (ECF No. 19-12; June 16, 2017), Exhibit 5 (copies of well permits and applications).

³⁴ Shelby County Well Construction Code, § 3.55.

³⁵ *Id.* § 3.38 (“Observation Well: A well constructed for the primary purpose of obtaining accurate, periodic measurements of groundwater.”).

³⁶ *Id.* § 3.36 (“Monitoring Well: A well constructed for monitoring groundwater quality and/or water level.”).

³⁷ *Id.* § 9.01(F).

³⁸ *Id.* § 14.01.

³⁹ *Id.* § 18.01(A).

Enclosures via CD in U.S. mail and via ShareFile at the following link:
<https://southernenvironment.sharefile.com/d-s7261242a27a49bc8>

cc: Alisa Haushalter, Director of Shelby County Health Department (*via email*)
Larry Smith, Assistant Manager of Air Pollution Control (*via email*)
Robert Rogers, Technical Manager of Pollution Control Section (*via email*)