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UNITED STATES COURT OF APPEALS

FOR THE SIXTH CIRCUIT

TENNESSEE CLEAN WATER NETWORK; TENNESSEE SCENIC RIVERS ASSOCIATION, *Plaintiffs-Appellees,* v. TENNESSEE VALLEY AUTHORITY, *Defendant-Appellant.*	No. 17-6155

Appeal from the United States District Court for the Middle District of Tennessee at Nashville.
No. 3:15-cv-00424 – Waverly D. Crenshaw Jr., District Judge.

Argued: August 2, 2018

Decided and Filed: September 24, 2018

Before SUHRHEINRICH, CLAY, and GIBBONS, Circuit Judges.

COUNSEL

ARGUED: David D. Ayliffe, TENNESSEE VALLEY AUTHORITY, Knoxville, Tennessee, for Appellant. Frank S. Holleman, III, SOUTHERN ENVIRONMENTAL LAW CENTER, Chapel Hill, North Carolina, for Appellees. **ON BRIEF:** David D. Ayliffe, James S. Chase, F. Regina Koho, Lane E. McCarty, TENNESSEE VALLEY AUTHORITY, Knoxville, Tennessee, for Appellant. Frank S. Holleman, III, Nicholas S. Torrey, SOUTHERN ENVIRONMENTAL LAW CENTER, Chapel Hill, North Carolina, Anne E. Passino, SOUTHERN ENVIRONMENTAL LAW CENTER, Nashville, Tennessee, Michael S. Kelley, Briton S. Collins, KENNERLY, MONTGOMERY & FINLEY, P.C., Knoxville, Tennessee, Austin D. Gerken, Jr., SOUTHERN ENVIRONMENTAL LAW CENTER, Asheville, North Carolina, for Appellees. Douglas H. Green, Margaret K. Fawal, VENABLE LLP, Washington, D.C., Eric M. Palmer, OFFICE OF THE ATTORNEY GENERAL OF ALABAMA, Montgomery, Alabama, Carlos C. Smith, Larry L. Cash, Mark W. Smith, MILLER & MARTIN PLLC, Chattanooga, Tennessee, Robert F. Parsley, M. Heith Frost, MILLER & MARTIN PLLC, Chattanooga, Tennessee, Nash E. Long, Brent A. Rosser, HUNTON & WILLIAMS LLP, Charlotte, North Carolina, Elbert Lin, HUNTON & WILLIAMS LLP, Richmond, Virginia, F. William Brownell, HUNTON & WILLIAMS LLP, Washington, D.C., Roger P. Sugarman, Scott M.

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SUHRHEINRICH, J., delivered the opinion of the court in which GIBBONS, J., joined. CLAY, J. (pp. 17–27), delivered a separate dissenting opinion.

OPINION

SUHRHEINRICH, Circuit Judge.

*438 I. INTRODUCTION

Defendant Tennessee Valley Authority ("TVA" or "Defendant") operates a coal-fired electricity-generating plant, the Gallatin Fossil Plant ("Gallatin plant"), on a part of the Cumberland River known as Old Hickory Lake, a popular recreation spot. The Gallatin plant generates wanted electricity (which it supplies to approximately 565,000 households in the greater Nashville area), as well as unwanted waste byproducts, in particular coal combustion

residuals ("CCRs") or coal ash. The plant disposes of the coal ash by "sluicing" (mixing with lots of water) and allowing the coal ash solids to settle in a series of unlined man-made coal ash ponds adjacent to the river. The Gallatin plant has a permit to discharge some of this coal combustion wastewater, which contains heavy metals and other pollutants, into the river through a pipe, known as Outfall 001. Other wastewater is allegedly discharged through leaks from the ponds through the groundwater into the Cumberland River, a waterway protected by the Clean Water Act ("CWA"), 33 U.S.C. § 1251, *et seq*. The CWA indisputably regulates the first type of discharge. The issue on appeal is whether the CWA also regulates the latter type of discharge.

After a bench trial, the district court found that TVA violated the CWA because its coal ash ponds at the Gallatin plant leaks pollutants through groundwater that is "hydrologically connected" to the Cumberland River without a permit. This theory of liability has been labeled the "hydrological connection theory" by the Federal Environmental Protection Agency ("EPA"). As explained in the companion decision also issued today, *Kentucky Waterways All., v. Kentucky Utilities Co.*, No. 18-5115, —— F. 3d —— —, 2018 WL 4559315 (6th Cir. 2018) ("*Kentucky Waterways*"), we find no support for this theory in either the text or the history of the CWA and related environmental laws. We therefore hold that the district court erred in granting relief under the CWA.

II. BACKGROUND

A. Statutory Background

Some background on the CWA is helpful. As explained in *Kentucky Waterways,* Congress passed the CWA in 1972 with the stated purpose of "restor[ing] and maintain[ing] the ... Nation's waters." 33 U.S.C. § 1251(a). To that end, the CWA requires a permit to "discharge ... any pollutant." *Id.* §§ 1311(a), 1342(a). The discharge of a pollutant is defined as "any addition of any pollutant to navigable waters from any point source." *Id.* § 1362(12)(A). Navigable waters are broadly defined as "the waters of the United States." *Id.* § 1362(7). And a point source is a "discernible, confined and discrete conveyance." *Id.* § 1362(14). These permits are issued pursuant to the CWA's National Pollutant Discharge Elimination System ("NPDES"). *Id.* § 1342. Therefore, in order to add a pollutant to the waters of the United States via a conveyance, an NPDES permit is required.

The CWA overhauled the 1948 Federal Water Pollution Control Act and the Water Quality Act of 1965 by shifting the focal point of liability from measuring excess pollution levels in the receiving water to capping effluent limitations from a discharging source. *See* S. Rep. No. 92-414 (1971), *as reprinted in* 1972 U.S.C.C.A.N. ***439** 3668, 3675 ("Under [the CWA] the basis of pollution prevention and elimination will be the application of effluent limitations. Water quality will be a measure of

program effectiveness and performance, not a means of elimination and enforcement.... With effluent limits, the [EPA] ... need not search for a precise link between pollution and water quality.").

With the CWA, Congress also sought to "recognize, preserve, and protect the primary responsibilities and rights of States to prevent, reduce, and eliminate pollution [and] to plan the development and use ... of land and water resources." 33 U.S.C. § 1251(b). The CWA accomplishes this by allowing the states to administer the CWA's NPDES permitting program themselves, provided their regulations are at least as stringent as the federal limitations, *id.* § 1342(b)-(d), and most notably, by drawing a line between point-source pollution and nonpoint-source pollution, *id.* § 1362(12),(14). Point-source pollution is subject to the NPDES requirements, and thus, to federal regulation under the CWA. But all other forms of pollution are considered nonpoint-source pollution and are within the states' regulatory domain. *See id.* §§ 1314(f), 1362(12); *see also Nat'l Wildlife Fed'n v. Consumers Power Co.*, 862 F.2d 580, 588 (6th Cir. 1988). Similarly, the CWA is restricted to regulation of pollutants discharged into navigable waters, *id.* § 1362(12), leaving the states to regulate pollution of non-navigable waters.

The EPA has the power under the CWA to issue orders and to bring civil and criminal actions against those in violation of its

provisions. *Id.* § 1319(a)-(c). The CWA also allows private citizens to file civil actions against violators, provided they give the EPA, the relevant state, and the alleged wrongdoer sixty-days' notice prior to filing the lawsuit. *Id.* § 1365(a)-(b); *see Sierra Club v. Hamilton Cty. Bd. of Cty. Comm'rs*, 504 F.3d 634, 637 (6th Cir. 2007) (noting private citizen suits "provide a second level of enforcement" and serve as a check on state and federal governments, who bear the primary enforcement responsibility for prosecuting CWA violations).

We have held that a CWA claim has five elements: "(1) a *pollutant* must be (2) *added* (3) *to navigable waters* (4) *from* (5) *a point source*." *Consumers Power Co.*, 862 F.2d 580 at 583 (quoting *Nat'l Wildlife Fed'n v. Gorsuch*, 693 F.2d 156, 165 (D.C. Cir. 1982)).

B. Factual Background

As noted, the Gallatin plant is adjacent to the Cumberland River, a "water[ ] of the United States." 33 U.S.C. § 1362(7). TVA has two coal ash ponds or impoundments at the Gallatin plant: the Non-Registered Site ("NRS") and the Ash Pond Complex ("Complex"). The NRS is closed, and the Complex is in the process of being closed.

1. The NRS

From 1956 to 1970, the Gallatin plant sluiced CCRs to the NRS, an unlined 65-acre site along the western edge of the river. The NRS is situated atop alluvium (loose soil, silt, clay). By

1973, TVA had dewatered the NRS. TVA closed the NRS in 1998, pursuant to the State of Tennessee's solid waste program. For this reason the NRS does not have an NPDES permit. Instead, the Tennessee Department of Environment and Conservation ("TDEC") regulates the "closed dry ash disposal area" according to its solid waste landfill standards, which include ongoing groundwater monitoring. *See* Tenn. Code Ann. § 68-211 *et seq*. Approximately 2.3 million cubic yards of coal ash are stored at the NRS.

Based on expert testimony from both sides, the district court found that "it does ***440** appear more likely than not that some portions of [the NRS as well as the Complex] penetrate the water table." The court concluded that the NRS is contaminated; that it leaked historically; that there was "no evidence to suggest that the 'closure' of the site ... wholly stopped the leaking."

2. The Complex

After 1970, TVA began treating its CCR in a series of unlined ponds, collectively known as the Complex. The ponds, which cover roughly 476 acres, treat sluiced wastewater by allowing CCRs to settle before releasing wastewater to the Cumberland River through Outfall 001. Approximately 11.5 million cubic yards of coal ash are stored at the Complex today. The parties agree that the Complex sits atop karst terrain, a landscape characterized by underground sinkholes, fissures, and caves caused by water-

dissolving limestone. *See* 40 C.F.R. § 257.53. Groundwater flows easily through the factures and other conduits created by the dissolved rock.

Historically, the Complex leaked significant amounts of pollutants into the river. Between 1970 and 1978, approximately 27 billion gallons of coal ash wastewater flowed directly from the Complex into the karst aquifer and then into the Cumberland River. The district court found it "beyond dispute that sinkholes have been recently discovered in the area[ ] of the Gallatin plant site" and would likely continue to form, given the nature of karst terrain. Thus, the court concluded that "[i]t is simply implausible, based on the evidence before the Court, that the Complex has not continued to, and will not continue to, suffer at least some leaking through karst features."

3. The Permit

In 1976, the EPA issued an NPDES permit authorizing the Gallatin plant to discharge wastewater from the Complex to the Cumberland River through Outfall 001. Today, TDEC issues and oversees the federal permitting process for the Gallatin plant.[1]

TDEC issued the permit in question ("Permit") on June 26, 2012,[2] after a public comment

[1] The EPA delegated its permitting authority to TDEC in 1986. TDEC issued its first NPDES permit to TVA for the Gallatin plant, in 1993.

[2] The Permit expired on May 31, 2017, and was administratively continued until a new permit was issued.

period. See 40 C.F.R. § 124.8 (requiring the EPA or state authority to issue a fact sheet for every draft permit setting forth "the principal facts and the significant factual, legal, methodological and policy questions considered in preparing the draft permit"); Tenn. Comp. R. & Regs. 0400-40-05-.06 ("Notice and Public Participation"). The Permit establishes effluent limitations, as well as monitoring and reporting requirements for certain pollutants within the wastewater.

Two additional provisions of the Permit are relevant to this lawsuit: (1) the "removed-substances" provision, which prohibits "[s]ludge or any other material removed by any treatment works" from causing "pollution of any surface or subsurface waters," and (2) the "sanitary-sewer overflow" provision, which prohibits the "discharge to land or water of wastes from any portion of the ... treatment system other than through permitted outfalls."

On August 21, 2014 (JX 248), and again on, April 25, 2016 (JX 249, 250), TDEC deemed TVA in compliance with the Permit.

***441 4. Procedural History**

Plaintiffs, two Tennessee conservation groups whose members use and enjoy Old Hickory Lake, saw the matter differently. Dissatisfied with the State of Tennessee's

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On May 1, 2018, TDEC issued a renewed NPDES Permit for the Gallatin plant. It became effective June 1, 2018, and is valid for five years.

enforcement efforts, they brought this CWA citizen suit on April 14, 2015, under to 33 U.S.C. § 1365, alleging that TVA violated the CWA and the Permit based on flows from the NRS and the Complex through hydrologically connected groundwater to the Cumberland River.[3]

On August 4, 2017, the district court entered judgment for Plaintiffs following a bench trial. First, the court ruled as a matter of law that the CWA applies to discharges of pollutants from a point source through hydrologically connected groundwater to navigable waters where the connection is "direct, immediate, and can generally be traced." The district court held that the NRS is a point source because it "channel[s] the flow of pollutants ... by forming a discrete, unlined concentration of coal ash," and that the Complex is also a point source because it is "a series of discernible, confined, and discrete ponds that receive wastewater, treat that wastewater,

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[3] On January 7, 2015, the State of Tennessee filed an original enforcement action under applicable state statutes, the Tennessee Solid Waste Disposal Act and the Tennessee Water Quality Control Act, in state court. *See State of Tenn, et al. v. TVA*, No. 15-0023-IV (Davidson Cty. Chanc. Ct. Jan. 7, 2015). Plaintiffs intervened in that action. The state action remains pending, although TVA removed it to federal court in August 2017. *See Slate ex rel. Slatery v. TVA*, No. 3:17-cv-01139, ECF No. 1 (M.D. Tenn. Aug. 19, 2017).
In the present case the district court applied CWA's diligent prosecution bar, *see* 33 U.S.C. § 1365(b)(1)(B), and limited the trial's scope to the allegations it deemed non-overlapping with the state enforcement action.

and ultimately convey it to the Cumberland River."

The court then found as a matter of fact that both the NRS and the Complex are hydrologically connected to the Cumberland River by groundwater. As to the NRS, the court held that "[f]aced with an impoundment that has leaked in the past and no evidence of any reason that it would have stopped leaking, the Court has no choice but to conclude that the [NRS] has continued to and will continue to leak coal ash waste into the Cumberland River, through rainwater vertically penetrating the Site, groundwater laterally penetrating the Site, or both."

The district court similarly found that historical evidence established that the Complex leaked. The court stated that "none of the science presented was capable of definitively identifying when the relevant pollutants entered the water," and that the record was "silent with regard to detailed, credible evidence of whether the undisputed historical leakage is capable of justifying pollutant concentrations in the amounts observed today." However, the court decided that "[o]n balance ... the evidence preponderates toward concluding that the discharges from the ... Complex are either ongoing or intermittent and recurring." The court therefore held that "the unanimous expert testimony is that sinkholes and other drainage features in karst terrain are not mere relics of some past geological event. Rather, the physical

properties of the terrain itself make such areas prone to the continued development of ever newer sinkholes or other karst features." Thus, based on the contaminants flowing from the NRS and the Complex, the court found TVA to be in violation of the CWA. The district court further concluded that karst-related leakage from the Complex violated the Permit's removed-substances and sanitary-sewer overflow provisions.

***442** As a remedy the court ordered TVA to "fully excavate" the coal ash in the Complex and the NRS (13.8 million cubic yards in total) and relocate it to a lined facility, rejecting TVA's proposal to dewater and put a cap on the unlined impoundments ("closure-in-place").[4] Although acknowledging that the burden of closure-by-removal "may be great," the court felt that it was "the only adequate resolution to an untenable situation that has gone on for far too long." Because of the costs associated with the injunctive remedy, the court did not assess civil penalties against TVA.

TVA appeals, arguing that the district court (1) erred in holding that the CWA's prohibition of

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[4] Closure-in-place involves dewatering an impoundment and capping it with a geosynthetic liner, borrow material, soil, and vegetation to prevent water from flowing into and through it. Closure-by-removal involves dewatering the CCR, excavating it, drying it sufficiently to move it, and then moving it to a permitted and lined landfill. A third option, "on-site closure," strikes a middle ground: it requires removal to a lined impoundment at the same location.

unpermitted point source discharges applies to pollutants that migrate through groundwater to navigable waters; (2) lacked authority to override the TDEC's regulatory decision not to impose NPDES liability for seepage and leakage of coal ash leachate through groundwater at the Gallatin plant in the Permit; and (3) abused its discretion in ordering complete excavation and relocation of the 13.8 million cubic yards of coal ash stored at the Gallatin plant.

III. ANALYSIS

We review a district court's decision to grant a permanent injunction "under several distinct standards." *S. Cent. Power Co. v. Int'l Bhd. of Elec. Workers, Local Union 2359*, 186 F.3d 733, 737 (6th Cir. 1999). "Factual findings are reviewed under the clearly erroneous standard, legal conclusions are reviewed *de novo*, and the scope of injunctive relief is reviewed for abuse of discretion." *Id.* As always, review of statutory construction is de novo. *Bowling Green v. Martin Land. Dev. Co.*, 561 F.3d 556, 558 (6th Cir. 2009).

A. Discharges from the NRS and the Complex

TVA first challenges the district court's ruling "that a cause of action based on an unauthorized point source discharge may be brought under the CWA based on discharges through groundwater, if the hydrologic connection between the source of the pollutants and navigable waters is direct, immediate, and

can generally be traced." TVA contends that the district court impermissibly expanded CWA liability beyond what Congress authorized, and created an unnecessary conflict with regulation of coal ash under the Resource Conservation and Recovery Act, ("RCRA"), 42 U.S.C. § 6901 *et seq*., and the CCR Rule, promulgated under RCRA, 80 Fed. Reg. 21,302 (Apr. 17, 2015).

1. Text and Structure of the CWA

TVA claims that the text and structure of the CWA demonstrate that the phrase "discharge of pollutants" excludes the migration of pollutants through groundwater. Plaintiffs maintain that the district court correctly concluded that the NRS and the Complex are point sources that add coal ash pollutants to the Cumberland River through groundwater with a direct hydrologic connection to the Cumberland River.[5] In finding TVA in violation of the CWA, th e district court made two legal conclusions: ***443** first, that coal ash ponds are "point sources"; and second, that surface water pollution via hydrologically connected groundwater is actionable under the CWA. Because we conclude that the hydrological connection theory is not a valid theory of liability, we reverse the district court's finding of liability here.[6]

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[5] Unlike the plaintiffs in *Kentucky Waterways*, Plaintiffs here do not argue that groundwater itself is a point source.

[6] Although we do not base our decision today on TVA's first argument, we note that the Fourth Circuit recently held that a landfill and settling pond did not serve as point sources simply because they allowed arsenic from coal ash to leach into groundwater and then to navigable waters.

See Sierra Club v. Va. Elec. & Power Co., No. 17-1952, 903 F.3d 403, 2018 WL 4343513 (4th Cir. Sept. 12, 2018):

> We conclude that while arsenic from the coal ash stored on Dominion's site was found to have reached navigable waters—having been leached from the coal ash by rainwater and groundwater and ultimately carried by groundwater into navigable waters—that simple causal link does not fulfill the Clean Water Act's requirement that the discharge be from a point source. By its carefully defined terms, the Clean Water Act limits its regulation under § 1311(a) to discharges from "*any discernible, confined and discrete conveyance*." 33 U.S.C. § 1362(14) (emphasis added). The definition includes, "but [is] not limited to[,] any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, or vessel or other floating craft." *Id.*; *see also Consol. Coal Co. v. Costle*, 604 F.2d 239, 249–50 (4th Cir. 1979), *rev'd in part sub nom. EPA v. Nat'l Crushed Stone Ass'n*, 449 U.S. 64, 101 S.Ct. 295, 66 L.Ed.2d 268 (1980) (finding that "discharges which are pumped, siphoned or drained" fall within the definition of discharges from a "point source"); *Appalachian Power v. Train*, 545 F.2d 1351, 1373 (4th Cir. 1976) (concluding that "point source" pollution does not include "unchanneled and uncollected surface waters"). At its core, the Act's definition makes clear that some facility must be involved that functions as a discrete, not generalized, "conveyance."
>
> "Conveyance" is a well-understood term; it requires a channel or medium—i.e., a facility—for the movement of something from one place to another. *See Webster's Third New International Dictionary* 499 (1961); *The American Heritage Dictionary of the English Language* 291–92 (1976); *see also S. Fla. Water Mgmt. Dist. v. Miccosukee Tribe of Indians*, 541 U.S. 95, 105, 124 S.Ct. 1537, 158 L.Ed.2d 264 (2004) ("[A] point source need not be the original source of the pollutant; it need only convey the pollutant to 'navigable waters' " (emphasis added)). If no such

As we explain in *Kentucky Waterways*,[7]

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conveyance produces the discharge at issue, the discharge would not be regulated by the Clean Water Act, though it might be by the RCRA, which covers and regulates the storage of solid waste, including coal ash, and its effect on groundwater.

903 F.3d at 410–11, 2018 WL 4343513, at *5. The court felt that

> [t]his understanding of the Clean Water Act's point-source requirement is consistent with the larger scheme of pollution regulation enacted by Congress. In regulating discharges of pollutants from point sources, Congress clearly intended to target the *measurable* discharge of pollutants. Not only is this revealed by the definitional text of "point source," but it is also manifested in the effluent limitation enforcement scheme that the Clean Water Act employs. The National Pollutant Discharge Elimination System Program and § 1311's enforcement scheme specifically rely on "effluent limitation[s]"—restrictions on the "quantities, rates, and concentrations" of pollutants discharged into navigable waters. 33 U.S.C. § 1362(11) (defining "effluent limitation"). And state-federal permitting programs under the Clean Water Act apply these precise, numeric limitations to discrete outfalls and other "point sources," *see* [*EPA v. California ex rel. Res. Control Bd.*, 426 U.S. [200,] 205–08 [96 S.Ct. 2022, 48 L.Ed.2d 578] (1976), at which compliance can be readily monitored. When a source works affirmatively to *convey* a pollutant, the concentration of the pollutant and the rate at which it is discharged by that conveyance *can be measured*. But when the alleged discharge is diffuse and not the product of a discrete conveyance, that task is virtually impossible.

Id. 411, 2018 WL 4343513, at *6.

[7] In *Kentucky Waterways*, the district court dismissed the plaintiffs' CWA claim, rejecting their argument that pollution via hydrologically connected groundwater could support CWA liability.

***444** [t]he backbone of [the] argument in favor of the hydrological connection theory is that the relevant CWA provision does not contain the word "directly." Because it only prohibits the discharge of pollutants "to navigable waters from any point source," 33 U.S.C. § 1362(12)(A), [proponents] argue that the CWA allows for pollutants to travel from a point source *through* nonpoint sources en route to navigable waters. The CWA's text suggests otherwise.

First, the guidelines by which a CWA-regulated party must abide—the heart of the CWA's regulatory power—are known as "effluent limitations." 33 U.S.C. § 1362(11); § 1314(b) These are caps on the quantities of pollutants that may be discharged from a point source and are prescribed on an industry-by-industry basis. *See* 33 U.S.C. § 1314(b). The CWA defines effluent limitations as restrictions on the amount of pollutants that may be "discharged from point sources *into* navigable waters." *Id.* § 1362(11) (emphasis added). The term "into" indicates directness. It refers to a point of *entry*. *See Into*, Webster's Third New International Dictionary, Unabridged. 2018. Web. 22 Aug. 2018. ("[E]ntry, introduction, insertion."); *Into*, Oxford English Dictionary (2d ed. 1989) ("Expressing motion to a position within a space or thing: To point within the limits of; to the interior of; *so as to enter*.")

> (emphasis added). Thus, for a point source to discharge *into* navigable waters, it must dump *directly* into those navigable waters—the phrase "into" leaves no room for intermediary mediums to carry the pollutants.
>
> Moreover, the CWA addresses only pollutants that are added "*to* navigable waters *from* any point source." 33 U.S.C. § 1362(12) (emphasis added). Accordingly, the CWA requires two things in order for pollution to qualify as a "discharge of a pollutant": (1) the pollutant must make its way to a navigable water (2) by virtue of a point-source conveyance.

Id. at ——.

Like the defendant utility company in *Kentucky Waterways,* TVA "is discharging pollutants into the groundwater and the groundwater is adding pollutants to" the Cumberland River. *Id.* "But groundwater is not a point source. Thus, when the pollutants are discharged to the river, they are not coming *from* a point source; they are coming from groundwater which is a nonpoint-source conveyance. The CWA has no say over that conduct." *Id.* For this reason, any alleged leakages into the groundwater are not a violation of the CWA.

Also similar to the plaintiffs in *Kentucky Waterways Alliance*, Plaintiffs here rely on Justice Scalia's statement in *Rapanos v. United States*, 547 U.S. 715, 126 S.Ct. 2208, 165 L.Ed.2d

159 (2006) that "[t]he [CWA] does not forbid the 'addition of any pollutant *directly* to navigable waters from any point source,' but rather the addition of any pollutant *to* navigable waters.' " *Id.* at 743, 126 S.Ct. 2208 (plurality opinion) (quoting 33 U.S.C. § 1362(12)(A)). But, as we discuss in *Kentucky Waterways*, that quote has been taken out of context, and the courts and litigants that rely on it in support of the hydrological connection theory

> have erred for a number of reasons. Not the least of which is that *Rapanos* is not binding here: it is a four-justice plurality ***445** opinion answering an entirely different legal question. *See id.* at 739, 126 S.Ct. 2208 (concluding that certain wetlands and intermittent streams did not themselves fall within the CWA's definition of navigable waters). In any event, when Justice Scalia pointed out the absence of the word "directly" from § 1362(12)(A), he did so to explain that pollutants which travel through multiple *point sources* before discharging into navigable waters are still covered by the CWA. *Id.* at 743, 126 S.Ct. 2208 ("[T]he discharge into intermittent channels of any pollutant that naturally washes downstream likely violates [the CWA], even if the pollutants discharged from a point source do not emit 'directly into' covered waters, but pass 'through conveyances' in between. (emphasis omitted)). Justice Scalia's reference to "conveyances"—the CWA's definition of a

> point source—reveals his true concern. He sought to make clear that intermediary point sources do not break the chain of CWA liability; the opinion says nothing of point-source-to-nonpoint-source dumping like that at issue here. And the facts in *Rapanos* confirm this to be true. The three wetlands that the Supreme Court defined out of the CWA in *Rapanos* were all linked to navigable waters by multiple different point sources (drains, ditches, creeks, and the like). *Id.* at 729-30, 126 S.Ct. 2208. Thus, our holding today does not stand in conflict with the *Rapanos* plurality.

Ky. Waterways All., —— F.3d ——, No. 18-5115, at ——. We further concluded that the CWA's other provisions and corresponding federal environmental laws strengthened this reading, which brings us to TVA's next argument—that the district court's hydrological connection holding directly conflicts with RCRA and the CCR Rule.

2. Statutory Context

Along with protecting the "Nation's waters," the CWA also protects the primary rights and responsibilities of the States to regulate pollution. 33 U.S.C. § 1251(a), (b). Congress specifically designed other environmental statutes to partner with the CWA:

> RCRA is designed to work in tandem with other federal environmental protection laws, including the CWA. *See* 42 U.S.C. § 6905(b) ("The [EPA] shall integrate all

> provisions of [RCRA] for purposes of administration and enforcement and shall avoid duplication, to the maximum extent practicable, with the appropriate provisions of ... [the CWA].”). For that reason, RCRA and the CWA should be read as complementary statutes, each addressed at regulating different potential environmental hazards. *Cf. Erlenbaugh v. United States*, 409 U.S. 239, 243-44, 93 S.Ct. 477, 34 L.Ed.2d 446 (1972) (statutes that “pertain to the same subject” may be treated “as if they were one law,” because “whenever Congress passes a new statute, it acts aware of all previous statutes on the same subject”).

Ky. Waterways All., —— F.3d ——, No. 18-5115, at ——. Moreover, allowing the CWA to cover pollution of this sort would disrupt the existing regulatory framework. Because “RCRA explicitly exempts from its coverage any pollution that is subject to CWA regulation,” *id.*, 42 U.S.C. § 6903 (27), reading the CWA in this way would remove coal ash treatment and storage practices from RCRA’s coverage. “But coal ash is solid waste, and RCRA is specifically designed to cover solid waste.” *Id.* Thus, the proposed CWA reading would be “problematic.” *Id.*

Even “more problematic”

> is the fact that, pursuant to RCRA, the EPA has issued a formal rule that specifically ***446** covers coal ash storage and treatment. *See* 80 Fed. Reg. 21,302 (Apr. 17, 2015) (the “CCR Rule”). The

> CCR Rule was designed to regulate, among other things, coal ash ponds. *Id*. at 21,303. Yet because the EPA issued the CCR Rule under RCRA, reading the CWA to cover coal ash ponds would gut the rule. Adopting Plaintiffs' reading of the CWA would mean that any coal ash pond with a hydrological connection to a navigable water would require an NPDES permit, thus removing it from RCRA's coverage and with it, the CCR Rule. Almost all coal ash ponds sit near navigable waterways because of the large amounts of water needed to operate coal-fired power plants. As such, adopting Plaintiffs' interpretation of the CWA would leave the CCR Rule virtually useless. We decline to interpret the CWA in a way that would effectively nullify the CCR Rule and large portions of RCRA.

Id., —— F.3d ——, No. 18-5115, at —— (citation omitted).

The CCR Rule "specifically addresses the 'disposal of coal [ash] as solid waste under [RCRA].' " *Id*. at ——, (quoting 80 Fed. Reg. at 21,302). The CCR Rule therefore "requires any existing unlined CCR surface impoundment that is contaminating groundwater above a regulated constituent's groundwater protection standard to stop receiving CCR and either retrofit or close." *Id*. (quoting 80 Fed. Reg. at 21,302). The rule also establishes minimum criteria for CCR surface impoundments, requires groundwater monitoring, and further demands corrective

action where groundwater contamination exceeds accepted levels. *Id.* (citing 80 Fed. Reg. at 21,396-408). In other words, the CCR Rule, not the CWA, is the framework envisioned by Congress (by delegating rulemaking authority to the EPA through RCRA) to address the problem of groundwater contamination caused by coal ash impoundments.

For these reasons, we hold that the district court erred in adopting Plaintiffs' theory that the CWA prohibits discharges of pollutants through groundwater that is hydrologically connected to navigable waters.

B. Removed-Substances and Sanitary-Sewer Overflow Provisions

Because the district court also held that TVA violated the CWA based on two other provisions of the Permit, our inquiry is not yet at an end. TVA challenges the district court's holdings that TVA violated the Permit's removed-substances and sanitary-sewer overflow provisions based on Plaintiffs' demonstration of unauthorized discharges of coal ash from the Complex. NPDES permits are interpreted like contracts. *Piney Run Pres. Ass'n v. Cty. Comm'rs of Carroll Cty.*, 268 F.3d 255, 269 (4th Cir. 2001).

1. Removed-Substances Provision

The removed-substances provision is found in Part I of the Permit, which sets forth "Effluent Limitations and Monitoring Requirements." It provides that "TVA Gallatin Fossil Plant is authorized to discharge" enumerated pollutants

"through Outfall 001," including "ash transport water" and "ash sluice water leakage." These discharges are "limited and monitored by the permittee" according to specified "parameters," limitations on quantities, rates, and concentrations of specified chemicals. Part I.A(c) by its terms, is an "[a]dditional monitoring requirement[ ] and condition[ ]applicable to Outfalls 001, 002, and 004." It states that "[s]ludge or any other material removed by any treatment works must be disposed of in a manner, which prevents its entrance into or pollution of any surface or subsurface waters."

***447** Noting that some of the ash waste produced as a result of the sluicing process escapes to the Cumberland River, the district court held simply that "Plaintiffs' demonstration of unauthorized discharges from the Ash Pond Complex" established "a violation of the facial terms of Part I.A(c)." But karst-related leaks are not discharges from "Outfalls 001, 002, and 004." Thus, this provision simply does not apply, and was therefore not violated by the conduct at issue in this case.

2. Sanitary-Sewer Overflow Provision

The sanitary-sewer overflow provision, found in Part II of the Permit, prohibits "the discharge to land or water of wastes from any portion of the collection, transmission, or treatment system other than through permitted outfalls." The district court held that, "[a]s with [the removed-substances provision], this allegation is resolved

by Plaintiffs' demonstration that TVA improperly discharged coal ash waste through leaks to the ... Complex."

But this provision also cannot be reasonably read to cover karst-related leaks. While the Permit does not define sewage, it treats it as a distinct type of "Pollutant" distinct from "industrial wastes, or other wastes." *See* 33 U.S.C. § 1362(6) (defining "pollutant" as including "sewage" as well as "chemical wastes"). This distinction is consistent with the EPA definition of sanitary-sewer overflow as involving "[a]n untreated or partially treated *sewage* release from a sanitary sewer system." The EPA's NPDES Permit Writers' Manual states that "occasional, unintentional spills of raw sewage from municipal sanitary sewers occur in almost every system. Such types of releases are called sanitary sewer overflows (SSOs)." The district court, by treating coal ash wastewater as a sanitary-sewer overflow, ignored the plain meaning of sewage. Further, the Permit treats these types of pollutants differently. Industrial wastes like "discharge ash transport water" and "ash sluice water leakage" are authorized with limitations while "Sanitary Sewer Overflows are prohibited." Thus, karst-related leakage cannot be a violation of this provision.

Because the plain language of these two provisions does not apply to karst-related discharges from the Complex, there is no violation of the Permit. Neither provision supports the district court's injunction. Given

this conclusion, we need not address TVA's arguments that that the collateral attack and permit shield doctrines shield it from liability.

C. Injunctive Relief

Without CWA liability, the district court's injunction has no foundation. Its imposition was therefore an abuse of discretion.

IV. CONCLUSION

As the district court rightly concluded, "an unlined [coal] ash waste pond in karst terrain immediately adjacent to a river" that leaks pollutants into the groundwater is a major environmental problem that the Permit does not adequately address. But the CWA is not the proper legal tool of correction. Fortunately, other environmental laws have been enacted to remedy these concerns. For these reasons, as well as those articulated in *Kentucky Waterways*, we REVERSE the judgment of the district court imposing CWA liability on TVA.

DISSENT

CLAY, Circuit Judge, dissenting. Can a polluter escape liability under the Clean Water Act ("CWA"), 33 U.S.C. §§ 1251–1387, by moving its drainage pipes a few feet from the riverbank? The ***448** Fourth and Ninth Circuits have said no. In two cases today,[1] the majority says yes. Because the majority's conclusion is contrary to the plain text and history of the CWA, and because I disagree with the majority's analysis of the permit's Sanitary Sewer Overflow provision, I respectfully dissent from the majority's position as to these issues.

I. Scope of the Clean Water Act

Plaintiffs have invoked the CWA's citizen-suit provision, which provides that "any citizen may commence a civil action ... against any person ... who is alleged to be in violation of ... an effluent standard or limitation under this chapter[.]" 33 U.S.C. § 1365(a). "For purposes of this section, the term 'effluent standard or limitation under this chapter' means," among other possibilities, "an unlawful act under subsection (a) of section 1311 of this title." § 1365(f). In turn, § 1311(a) prohibits "the discharge of any pollutant by any person[.]"

[1] The other case is Case No. 18-5115, *Kentucky Waterways Alliance, et al. v. Kentucky Utilities Co.*

The broad sweep of a defendant's potential CWA liability is limited in two ways. First, Congress included a list of exceptions in § 1311(a) itself: the discharge of a pollutant is unlawful "[e]xcept in compliance with this section and sections 1312, 1316, 1317, 1328, 1342, and 1344 of this title." Second, Congress gave the phrase "discharge of a pollutant" a very specific definition: it means "any addition of any pollutant to navigable waters from any point source." 33 U.S.C. § 1362(12)(A). Taken together, Congress thus authorized citizen suits to prevent the "addition of any pollutant to navigable waters from any point source," *see* § 1362(12)(A), but if a listed statutory exception applies, *see* § 1311(a).

The majority argues that this standard cannot be satisfied when, as here, pollution travels briefly through groundwater before reaching a navigable water. Plaintiffs counter that such an exception has no statutory basis and would allow polluters to shirk their CWA obligations by placing their underground drainage pipes a few feet away from the shoreline. This case could have profound implications for those in this Circuit who would pollute our Nation's waters. And the issue is novel. This Court has never before considered whether the CWA applies in this context.

However, the Fourth and Ninth Circuits have. Both courts determined that a short journey through groundwater does not defeat CWA liability. *See Upstate Forever v. Kinder Morgan Energy Partners, L.P.*, 887 F.3d 637, 649–51 (4th Cir. 2018); *Hawai'i Wildlife Fund v. Cty. of Maui*, 886 F.3d 737, 745–49 (9th Cir. 2018). The Second Circuit reached a similar

conclusion where the pollutants traveled briefly through fields (which are not necessarily point sources) and through the air. *See Concerned Area Residents for Env't v. Southview Farm*, 34 F.3d 114, 118–19 (2d Cir. 1994) (fields); *Peconic Baykeeper, Inc. v. Suffolk Cty.*, 600 F.3d 180, 188–89 (2d Cir. 2010) (air). Until today, no Circuit had come out the other way. The reason is simple: the CWA does not require a plaintiff to show that a defendant discharged a pollutant from a point source *directly* into navigable waters; a plaintiff must simply show that the defendant "add[ed] ... any pollutant *to* navigable waters *from* any point source." *See* §§ 1362(12)(A) (emphases added), 1365(a), 1311(a); *Upstate Forever*, 887 F.3d at 650; *Hawai'i Wildlife Fund*, 886 F.3d at 749.

***449** The Supreme Court addressed this precise issue in *Rapanos v. United States*, 547 U.S. 715, 126 S.Ct. 2208, 165 L.Ed.2d 159 (2006). There, Justice Scalia's plurality opinion was explicit:

> The Act does not forbid the "addition of any pollutant *directly* to navigable waters from any point source," but rather the "addition of any pollutant *to* navigable waters." [33 U.S.C.] § 1362(12)(A) (emphasis added); § 1311(a). Thus, from the time of the CWA's enactment, lower courts have held that the discharge into intermittent channels of any pollutant *that naturally washes downstream* likely violates § 1311(a), even if the pollutants discharged from a point source do not emit "directly into" covered waters, but pass "through conveyances" in between. *United States v. Velsicol Chemical Corp.*, 438

> F.Supp. 945, 946–947 (W.D.Tenn. 1976) (a municipal sewer system separated the "point source" and covered navigable waters). See also *Sierra Club v. El Paso Gold Mines, Inc.*, 421 F.3d 1133, 1137, 1141 (C.A.10 2005) (2.5 miles of tunnel separated the "point source" and "navigable waters").

Id. at 743, 126 S.Ct. 2208 (plurality opinion) (emphasis in original). True, Justice Scalia's plurality opinion is not binding. But no Justice challenged this aspect of the opinion, and for good reason: the statutory text unambiguously supports it.

Further, applying the CWA to point-source pollution traveling briefly through groundwater before reaching a navigable water promotes the CWA's primary purpose, which is to "restore and maintain the chemical, physical, and biological integrity of the Nation's waters." 33 U.S.C. § 1251(a). By contrast, the majority's approach defeats the CWA's purpose by opening a gaping regulatory loophole: polluters can avoid CWA liability by discharging their pollutants into groundwater, even if that groundwater flows immediately into a nearby navigable water. This exception has no textual or logical foundation. As one district court observed,

> it would hardly make sense for the CWA to encompass a polluter who discharges pollutants via a pipe running from the factory directly to the riverbank, but not a polluter who dumps the same pollutants into a man-made settling basin some distance short of the river and then allows the pollutants to seep into the river via the groundwater.

See N. Cal. River Watch v. Mercer Fraser Co., No. C-04-4620 SC, 2005 WL 2122052, at *2 (N.D. Cal. Sept. 1, 2005). In addition, this exception has no apparent limits. Based on the majority's logic, polluters are free to add pollutants to navigable waters so long as the pollutants travel through any kind of intermediate medium—for example through groundwater, across fields, or through the air. This would seem to give polluters free rein to discharge pollutants from a sprinkler system suspended above Lake Michigan. After all, pollutants launched from such a sprinkler system would travel "in all directions, guided only by the general pull of gravity." *Kentucky Waterways Alliance*, 18-5115 at 11, at ——. According to the majority, this would defeat CWA liability.[2]

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[2] The majority declines to reverse the district court's other finding that a coal ash pond is a point source under the CWA, but suggests disagreement in a footnote. The CWA defines "point source" as "any discernible, confined and discrete conveyance," including "any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, or vessel or other floating craft, from which pollutants are or may be discharged." 33 U.S.C. § 1362(14). The majority cites a recent Fourth Circuit case, Sierra Club v. Va. Elec. & Power Co., No. 17-1952, 903 F.3d 403, 2018 WL 4343513 (4th Cir. Sept. 12, 2018), which held that a coal ash pond is not a point source because it was a "static recipient[ ] of the precipitation and groundwater that flowed through [it]." 903 F.3d at 411, 2018 WL 4343513 at *6. Looking at the text of the CWA, however, shows that, inter alia, "ditch[es], well[s], container[s]," and "vessel[s]" are included in the definition. 33 U.S.C. § 1362(14). The canon of ejusdem generis states that "the general term must take its meaning from the specific terms with which it appears." Retail Ventures, Inc. v. Nat'l Union Fire Ins. Co. of Pittsburgh, 691 F.3d 821, 833 (6th Cir. 2012). The common denominator between wells, containers, ditches, and vessels is that each is a man-made,

***450** I have a very different view. In cases where, as here, a plaintiff alleges that a defendant is

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defined area where liquid collects. The canon of ejusdem generis thus suggests that man-made coal ash ponds are included in this definition. The Fourth Circuit instead cites a dictionary definition of "conveyance" as "a facility—for the movement of something from one place to another" without explaining how items like wells, containers, and vessels fit this definition. Va. Elec. & Power Co., 903 F.3d at 410, 2018 WL 4343513, at *5 (quoting Webster's Third New International Dictionary 499 (1961)). The Fourth Circuit suggests that a container can be a point source only if it is in the act of conveying something, 903 F.3d at 412–13, 2018 WL 4343513, at *7, ignoring that the statutory definition includes "any ... container ... from which pollutants are or may be discharged." 33 U.S.C. § 1362(14) (emphasis added).

The Fourth Circuit's approach is further misguided in that it conflicts with the broad interpretation that federal courts have traditionally given to the phrase "point source." See, e.g., Simsbury-Avon Pres. Society, Inc. v. Metacon Gun Club, Inc., 575 F.3d 199, 219 (2d Cir. 2009) (quoting Dague v. City of Burlington, 935 F.2d 1343, 1354–55 (2d Cir. 1991), rev'd on other grounds, 505 U.S. 557, 112 S.Ct. 2638, 120 L.Ed.2d 449 (1992)) ("[T]he definition of a point source is to be broadly interpreted."); Cmty. Ass'n for Restoration of the Env't v. Henry Bosma Dairy, 305 F.3d 943, 955 (9th Cir. 2002) (quoting Dague, 935 F.2d at 1354–55); Cmty. Ass'n for Restoration of Env't (CARE) v. Sid Koopman Dairy, 54 F.Supp.2d 976, 980 (E.D. Wash. 1999) (citing Dague, 935 F.2d at 1354–55); Yadkin Riverkeeper, Inc. v. Duke Energy Carolinas, LLC, 141 F.Supp.3d 428, 444 (M.D. N.C. 2015) (quoting Dague, 935 F.2d at 1354–55); see United States v. Earth Scis., Inc., 599 F.2d 368, 373 (10th Cir. 1979) ("[T]he concept of a point source was designed to further [the CWA's regulatory] scheme by embracing the broadest possible definition of any identifiable conveyance from which pollutants might enter the waters of the United States."). By embracing a restrictive definition of what constitutes a point source, the Fourth Circuit jettisons these long-standing principles.

polluting navigable waters through a complex pathway, the court should require the plaintiff to prove the existence of pollutants in the navigable waters and to persuade the factfinder that the defendant's point source is to blame—that the defendant is unlawfully "add[ing] ... any pollutant to navigable waters from any point source." 33 U.S.C. § 1362(12)(A). The more complex the pathway, the more difficult the proof. Where these cases are plausibly pleaded, they should be decided on the facts.

Instead, the majority holds that a plaintiff may never—as a matter of law—prove that a defendant has unlawfully added pollutants to navigable waterways via groundwater. For its textual argument, the majority refers us to the term "effluent limitations." This term, the majority says, is defined as "restrictions on the amount of pollutants that may be 'discharged from point sources *into* navigable waters.' " Maj. Op. at 444 (quoting with emphasis 3 U.S.C. § 1362(11)). Seizing on the word "into"—which denotes "entry, introduction, insertion"—the majority concludes that the effluent-limitation definition implicitly creates an element of "directness." In other words, the majority reasons, "for a point source to discharge *into* navigable waters, it must dump *directly* into those navigable waters[.]" *Id.* (emphasis in original).

***451** The majority is way off the rails. First of all, "Congress 'does not alter the fundamental details of a regulatory scheme in vague terms or ancillary provisions—it does not, one might say, hide elephants in mouseholes.' " *Epic Sys. Corp. v. Lewis*,

—— U.S. ——, 138 S. Ct. 1612, 1626–27, 200 L.Ed.2d 889 (2018) (quoting *Whitman v. Am. Trucking Assns., Inc.*, 531 U.S. 457, 468, 121 S.Ct. 903, 149 L.Ed.2d 1 (2001)). The majority should heed this commonsense advice. Congress did not hide a massive regulatory loophole in its use of the word "into."

But more importantly, the majority's quoted definition of "effluent limitation" from § 1362(11)—the supposed origin of the loophole—is not relevant to this case. The citizen-suit provision uses the term "effluent standard or limitation"—not the term "effluent limitation." *See* 33 U.S.C. § 1365(f). As the majority itself argues, minor distinctions in statutory language sometimes matter. This one does. The phrase "effluent standard or limitation" is a term of art and is wholly distinct from the term "effluent limitation." This conclusion is supported not by tea leaves or a carefully selected dictionary, but rather by the CWA itself. The citizen-suit provision of the CWA provides that "effluent standard or limitation" means, among other things, "an unlawful act under subsection (a) of section 1311 of this title." 33 U.S.C. § 1365(a). Turning to § 1311(a), we find that, absent certain exceptions, "the discharge of any pollutant by any person shall be unlawful," § 1311(a), and the "discharge of a pollutant" means "any addition of any pollutant *to* navigable waters from any point source," § 1362(12)(A) (emphasis added). Thus, even assuming the majority correctly parses the definition of "into"—a dubious proposition at best—the word "into" is not contained in any of the statutory provisions at issue. Rather, we find the word "to," which does not even arguably suggest a requirement of directness; the word "to" merely "indicate[s]

movement or an action or condition suggestive of movement toward a place, person, or thing reached." *To*, Merriam-Webster Dictionary, https://www.merriam-webster.com/dictionary/to.

It is therefore entirely unclear why the majority relies on the definition of "effluent limitation." That definition is simply irrelevant to this lawsuit. As a result, the majority's criticisms of the approach taken by the Fourth and Ninth Circuits miss the mark. Indeed, the Fourth Circuit analyzed the correct statutory text when it rejected the argument that the citizen-suit provision requires directness:

> [t]he plain language of the CWA requires only that a discharge come "from" a "point source." *See* 33 U.S.C. § 1362(12)(A). Just as the CWA's definition of a discharge of a pollutant does not require a discharge directly to navigable waters, *Rapanos*, 547 U.S. at 743, 126 S.Ct. 2208, neither does the Act require a discharge directly from a point source, *see* 33 U.S.C. § 1362(12)(A). The word "from" indicates "a starting point: as (1) a point or place where an actual physical movement ... *has its beginning*." Webster's Third New International Dictionary 913 (Philip Babcock Gove et al. eds., 2002) (emphasis added); *see also* The American Heritage Dictionary of the English Language 729 (3d ed. 1992) (noting "from" indicates a "starting point" or "cause"). Under this plain meaning, a point source is the starting point or cause of a discharge under the CWA, but that starting point need not also convey the discharge directly to navigable waters.

Upstate Forever, 887 F.3d at 650 (footnote omitted). In short, if the majority would like to add a "directness" requirement to ***452** § 1311, it must fight the statutory text to get there.

In addition, the majority fails to meaningfully distinguish Justice Scalia's concurrence in Rapanos, which made clear that the CWA applies to indirect pollution. It is true that Rapanos dealt with different facts. But it is irrelevant that the pollution in Rapanos traveled through point sources before reaching a navigable water, whereas the pollution in this case traveled through groundwater, which, according to the majority, is not a point source. In both cases, the legal issue is the same: whether the CWA applies to pollution that travels from a point source to navigable waters through a complex pathway. See Rapanos, 547 U.S. at 745, 126 S.Ct. 2208 (asking whether "the contaminant-laden waters ultimately reach covered waters"). Indeed, Justice Scalia favorably cited the Second Circuit's discussion in Concerned Area Residents for the Environment. Rapanos, 547 U.S. at 744, 126 S.Ct. 2208. In that case, pollutants traveled across fields—which "were not necessarily point sources themselves"—before reaching navigable waters. Hawai'i Wildlife Fund, 886 F.3d at 748. Given the Supreme Court plurality's endorsement of the Second Circuit's approach, the majority's attempt to distinguish Rapanos collapses.

Next, the majority warns that imposing liability would upset the cooperative federalism embodied by the CWA. On this view, the states alone are responsible for regulating pollution of groundwater, even if that pollution later travels to a navigable

water. Wrong again. To be sure, the CWA recognizes the "primary responsibilities and rights of States" to regulate groundwater pollution. 33 U.S.C. § 1251(b). But imposing liability in this case would not marginalize the states. To the contrary, the district court made clear that it was *not* regulating the pollution of groundwater itself. *See Tennessee Clean Water Network v. Tennessee Valley Authority*, 273 F. Supp. 3d 775, 826 (M.D.Tenn. 2017) ("The Court agrees with those courts that view the issue not as whether the CWA regulates the discharge of pollutants into groundwater itself but rather whether the CWA regulates the discharge of pollutants to navigable waters via groundwater." (quotation marks, alteration, and citation omitted)). Instead, the district court was addressing pollution of a navigable water—specifically, the Cumberland River—via groundwater. This distinction was clear to the Fourth and Ninth Circuits. *See Upstate Forever*, 887 F.3d at 652 ("We do not hold that the CWA covers discharges to ground water itself. Instead, we hold only that an alleged discharge of pollutants, reaching navigable waters ... by means of ground water with a direct hydrological connection to such navigable waters, falls within the scope of the CWA."); *Hawai'i Wildlife Fund*, 886 F.3d at 749 ("[T]he County's concessions conclusively establish that pollutants discharged from all four wells emerged at discrete points in the Pacific Ocean.... We leave for another day the task of determining when, if ever, the connection between a point source and a navigable water is too tenuous to support liability under the CWA."). Accordingly, imposing liability in this case fits perfectly with the CWA's stated purpose: to "restore and maintain the chemical,

physical, and biological integrity of the Nation's waters." 33 U.S.C. § 1251(a).

Finally, the majority offers a narrow reading of the CWA because, in its view, a more inclusive reading would render "virtually useless" the Coal Combustion Residuals ("CCR") Rule under the Resource Conservation and Recovery Act ("RCRA"). Maj. Op. at 445. The majority notes that if a polluter's conduct is regulated through a CWA permit, then RCRA does not also apply. The majority therefore suggests ***453** that a straightforward reading of the CWA is incompatible with RCRA. The majority would gut the former statute to save the latter.

But the EPA has already dismissed the majority's concern. Indeed, the EPA issued federal regulations on this issue many decades ago. The EPA's interpretation is that the industrial discharge of waste such as CCR is subject to regulation under both RCRA and the CWA: RCRA regulates the way polluters store CCR, and the CWA kicks in the moment CCR enters a navigable waterway. *See* 40 C.F.R. § 261.4(a)(2). The EPA first articulated this approach in a set of regulations from 1980, which provide that "[i]ndustrial wastewater discharges that are point source discharges subject to regulation under section 402 of the Clean Water Act" "are not solid wastes for the purpose of" the RCRA exclusion. 40 C.F.R. § 261.4(a)(2). This exclusion, the regulation explains, "applies only to the *actual point source discharge*. It does not exclude industrial wastewaters while they are being collected, stored or treated before discharge, nor does it exclude sludges that are

generated by industrial wastewater treatment." § 261.4(a)(2) (comment) (emphasis added). Thus, under the EPA's reading, a polluter can be liable under RCRA for improperly storing CCR—even if the CCR never enters a navigable waterway. *See id.* Conversely, a polluter can be liable under the CWA for adding CCR to a navigable waterway—even if the polluter's storage methods comport with RCRA. *See id.* And of course, a polluter can be liable under both statutes if the polluter both improperly stores CCR and discharges it to a navigable waterway. *See id.*

The EPA settled any doubts on this matter by publishing a detailed description of its rationale in the Federal Register. *See* 45 Fed. Reg. 33098. The EPA explained that 40 C.F.R. § 261.4(a)(2) reflects the EPA's interpretation that regulation of a polluter's discharge of industrial waste to a navigable waterway pursuant to the CWA does *not* trigger the 42 U.S.C. § 6903(27) exclusion and therefore does *not* exempt that polluter's storage of CCR from regulation under RCRA:

> The obvious purpose of the industrial point source discharge exclusion in Section 1004(27) was to avoid duplicative regulation of point source discharges under RCRA and the Clean Water Act. Without such a provision, the discharge of wastewater into navigable waters would be "disposal" of solid waste, and potentially subject to regulation under both the Clean Water Act and Subtitle C [of RCRA]. These considerations do not apply to industrial wastewaters prior to discharge since most of the environmental hazards posed by wastewaters in treatment and

holding facilities—primarily groundwater contamination—cannot be controlled under the Clean Water Act or other EPA statutes.
Had Congress intended to exempt industrial wastewaters in storage and treatment facilities from all RCRA requirements, it seems unlikely that the House Report on RCRA would have cited, as justification for the development of a national hazardous waste management program, numerous damage incidents which appear to have involved leakage or overflow from industrial wastewater impoundments. *See, e.g.*, H.R. Rep. at 21. Nor would Congress have used the term "discharge" in Section 1004(27). This is a term of art under the Clean Water Act (Section 504(12)) and refers only to the "addition of any pollutant to navigable waters", not to industrial wastewaters prior to and during treatment.
***454** Since the comment period closed on EPA's regulations, both Houses of Congress have passed amendments to RCRA which are designed to provide EPA with more flexibility under Subtitle C in setting standards for and issuing permits to existing facilities which treat or store hazardous wastewater. *See* Section 3(a)(2) of H.R. 3994 and Section 7 of S.1156. *See also* S. Rep. No. 96-173, 96th Cong., 1st Sess. 3 (1979); Cong. Rec. S6819, June 4, 1979 (daily ed.); Cong. Rec. H1094–1096, February 20, 1980 (daily ed.). These proposed amendments and the accompanying legislative history should lay to rest any question of whether Congress intended

> industrial wastewaters in holding or treatment facilities to be regulated as "solid waste" under RCRA.

45 Fed. Reg. 33098. Congress ratified the EPA's interpretation when it enacted amendments to RCRA, which the EPA said would "lay to rest" any concerns about whether industrial wastes like CCR are subject to regulation under both RCRA (in terms of their storage and treatment) and the CWA (in terms of their discharge to navigable waters). *Id.*; *see* Public Law 96-482. From this history, and from the text of the statutes, we can surmise that Congress intended to delegate to the EPA the power "to speak with the force of law" on this aspect of the interplay between RCRA and the CWA. *See United States v. Mead Corp.*, 533 U.S. 218, 229, 121 S.Ct. 2164, 150 L.Ed.2d 292 (2001). Exercising this authority, the EPA reached an interpretation that is different from—and incompatible with—that of the majority.

Contravening bedrock principles of administrative law, the majority bulldozes the EPA's interpretation of its own statutory authority without even discussing the possibility of deference. But "[w]e have long recognized that considerable weight should be accorded to an executive department's construction of a statutory scheme it is entrusted to administer, and the principle of deference to administrative interpretations." *Chevron, U.S.A., Inc. v. Nat. Res. Def. Council, Inc.*, 467 U.S. 837, 844, 104 S.Ct. 2778, 81 L.Ed.2d 694 (1984).

> In Chevron, this Court held that ambiguities in statutes within an agency's jurisdiction to administer are delegations of authority to the agency to fill the statutory gap in reasonable

> fashion. Filling these gaps, the Court explained, involves difficult policy choices that agencies are better equipped to make than courts. 467 U.S. at 865–866, 104 S.Ct. 2778. If a statute is ambiguous, and if the implementing agency's construction is reasonable, Chevron requires a federal court to accept the agency's construction of the statute, even if the agency's reading differs from what the court believes is the best statutory interpretation.

Nat'l Cable & Telecomms. Ass'n v. Brand X Internet Servs., 545 U.S. 967, 980, 125 S.Ct. 2688, 162 L.Ed.2d 820 (2005). The EPA says that imposing CWA liability for the discharge of CCR to navigable waterways does not eliminate the possibility of RCRA liability for the storage and treatment of CCR. The majority suggests the exact opposite. Unfortunately for the majority, but fortunately for those who enjoy clean water, the majority lacks the authority to override longstanding EPA regulations on a whim. *See id.*

For all these reasons, I believe the CWA clearly applies to the pollution in this case. Accordingly, I would join our sister circuits in holding that the CWA prohibits all pollution that reaches navigable waters "by means of ground water with a direct hydrological connection to such navigable waters[.]" ***455** *Upstate Forever*, 887 F.3d at 652; *see Hawai'i Wildlife Fund*, 886 F.3d at 745–49. Under this standard, the unpermitted leaks from NRS and Complex are clearly unlawful.

II. The Permit's Sanitary Sewer Overflow Provision

The permit prohibits "Sanitary Sewer Overflows," which it defines as "the discharge to land or water of wastes from any portion of the collection, transmission, or treatment system other than through permitted outfalls." (R. 1-2, permit, PageID# 79.) The district court found, and TVA no longer disputes, that the Complex discharges coal ash waste to groundwater through its unlined, leaking sides and bottoms. These discharges are not authorized by the permit. Therefore, Plaintiffs have proven a permit violation.

The majority avoids this result by overcomplicating the issue. Ignoring the plain text of the permit, the majority instead champions the EPA's standard definition of "Sanitary Sewer Overflow," which is narrow and arguably saves TVA from liability. This reasoning is perplexing. The EPA's definition should play no role in the legal analysis here because the permit itself defines "Sanitary Sewer Overflow." Indeed, TVA's permit expert conceded in the district court that the permit's definition is broader than the EPA's definition. Accordingly, this Court should apply the plain text of the permit's definition, as it would apply the plain text of any contract. This Court has no plausible authority or reason to substitute a definition provided in the permit with one drafted in a different context by a nonparty who has no relation to this case.

Further, the EPA's standard definition makes little sense in this context. As the majority

recognizes, that definition applies only to sewage from sanitary sewer systems. But a coal ash pond is not a "sanitary sewer system." It does not contain "sewage." Consequently, interpreting the Sanitary Sewer Overflow provision to regulate sewage alone would render the provision meaningless. This Court should avoid such an interpretation, especially when the permit itself provides a definition that does not trigger any such concerns. *See Gallo v. Moen Inc.*, 813 F.3d 265, 273 (6th Cir. 2016) (noting the general rule that "courts should interpret contracts to avoid superfluous words").

For these reasons, I would hold that the district court correctly ruled that the Complex's karst-related leaks violate the sanitary-sewer provision.

Conclusion

As set forth above, I believe that the CWA applies to TVA's indirect pollution of navigable waters and that TVA violated the permit's Sanitary Sewer Overflow provision. Because the majority disagrees as to both issues, I respectfully dissent.

UNITED STATES DISTRICT COURT
MIDDLE DISTRICT OF TENNESSEE
NASHVILLE DIVISION

TENNESSEE CLEAN WATER NETWORK; TENNESSEE SCENIC RIVERS ASSOCIATION, **Plaintiffs,** **v.** **TENNESSEE VALLEY AUTHORITY,** **Defendant.**	**No. 3:15-CV-00424** **CHIEF JUDGE CRENSHAW**

ORDER

WAVERLY D. CRENSHAW, JR., CHIEF UNITED STATES DISTRICT JUDGE

***1** On January 30 through February 2, 2017, the Court held a bench trial on the remaining Clean Water Act ("CWA") claims filed by the Tennessee Clean Water Network and Tennessee Scenic Rivers Association ("Plaintiffs") against the Tennessee Valley Authority ("TVA") relating to TVA's operation of a coal-fired power plant about five miles south of the city of Gallatin, Tennessee. For the reasons discussed in the accompanying Findings of Fact & Conclusions of Law, the Court hereby directs the entry of judgment for the Plaintiffs on Claims A, C, D, E.b, and E.e and judgment for TVA on Claims B, E.a, E.c and E.d. The Court further holds that no civil fines shall be assessed against TVA in light of

the substantial costs expected to be associated with remediating its violations.

TVA is ordered to wholly excavate the ash waste disposal areas designated in the accompanying Findings of Fact & Conclusions of Law as the Ash Pond Complex and the Non-Registered Site and shall relocate the excavated coal ash waste to a lined impoundment with no significant risk of discharge into the waters of the United States. Within thirty days of the entry of this Order, TVA shall file an itemized proposed timetable for compliance, including a proposed schedule for filing periodic updates with the Court.

The injunctive relief granted by this Order shall be considered a minimum obligation and should not be construed to restrict, conflict with, or foreclose any more comprehensive relief arising out of the litigation currently ongoing in Tennessee state courts or any other litigation, proceeding, administrative process, or other source of law. If any injunction or other obligation arises out of that or any other action that directly conflicts with the obligations imposed by this Court, TVA and/or Plaintiffs shall file motions with the Court seeking modification or clarification of this Order.

The Court hereby directs the Clerk to enter judgment in accordance with Federal Rule of Civil Procedure 58.

IT IS SO ORDERED.

s/ WAVERLY D. CRENSHAW, JR.
CHIEF UNITED STATES DISTRICT JUDGE

UNITED STATES DISTRICT COURT
MIDDLE DISTRICT OF TENNESSEE
NASHVILLE DIVISION

TENNESSEE CLEAN WATER NETWORK; TENNESSEE SCENIC RIVERS ASSOCIATION, **Plaintiffs,** **v.** **TENNESSEE VALLEY AUTHORITY,** **Defendant.**	**No. 3:15-CV-00424** **CHIEF JUDGE CRENSHAW**

FINDINGS OF FACT & CONCLUSIONS OF LAW

WAVERLY D. CRENSHAW, JR., CHIEF UNITED STATES DISTRICT JUDGE

***781** The Tennessee Clean Water Network and Tennessee Scenic Rivers Association ("Plaintiffs") filed a Complaint against the Tennessee Valley Authority ("TVA") alleging numerous violations of the Clean Water Act ("CWA") related to TVA's operation of a coal-fired power plant about five miles south of the city of Gallatin, Tennessee ("Gallatin Plant"). (Doc. No. 1.) On September 9, 2016, the Court dismissed a portion of Plaintiffs' claims on the

merits and a portion of the claims on the ground that the Court was barred from considering the allegations at issue in light of an ongoing State of Tennessee enforcement proceeding. (Doc. No. 139.) On January 30 through February 2, 2017, the Court held a bench trial on the remaining claims.

For the reasons discussed herein, the Court will direct the Clerk to enter judgment for the Plaintiffs on Claims A, C, D, E.b, and E.e. It will direct the Clerk to enter judgment for TVA on Claims E.c and E.d, as well as Claims B and E.a, which were dismissed by earlier Order of the Court. (Doc. No. 140.) TVA shall be ordered to excavate the Ash Pond Complex and Non–Registered Site and move the coal ash waste currently therein to a lined impoundment. In light of the substantial costs TVA is likely to incur in remediating its ash pond disposal areas, the Court declines to assess penalties on top of its injunctive relief.

I. CLAIMS

1. The following claims are before the Court:

- **Claim A** alleges generally that TVA unlawfully discharged pollutants into the waters of the United States from a point source or point sources through hydrologic flow from its ash ponds to the Cumberland River.

- **Claim C** alleges specifically that TVA is responsible for unpermitted point source discharges from the abandoned ash pond area known as the "Non–Registered Site."

- **Claim D** alleges specifically that TVA is responsible for unauthorized point source discharges from its currently active ash pond complex, known as the "Ash Pond Complex."

- **Claim E.b** alleges that TVA violated Part I.A(c) of its NPDES permit.

- **Claim E.c** alleges that TVA violated Part II.A(4.a) of its NPDES permit.

- **Claim E.d** alleges that TVA violated Part II.C(2) of its NPDES permit.

- **Claim E.e** alleges that TVA violated Part II.C(3.b) of its NPDES permit.

2. In light of the Court's September 9, 2016 ruling and the ongoing State proceedings, the above claims are limited to two types of alleged discharges from the Gallatin Plant: discharges from the Non–Registered Site into the Cumberland River; and discharges from the Ash Pond Complex via hydrologic flows that are not seeps alone. By the terms of the Court's Order, this limitation applies not only to claims A, C, and D—which explicitly allege unauthorized discharges—but also to claims E.b through E.e, insofar as those claims are premised on allegations related to leaks. (Id.)

II. NATURE OF FINDINGS AND CONCLUSIONS

3. After reviewing the parties' proposed findings and conclusions, their arguments, the record, the exhibits received in evidence, and the testimony of the witnesses and consideration of their interests and demeanor, the Court enters the following Findings of Fact and Conclusions of Law ***782** in accordance with Rule 52(a) of the Federal Rules of Civil Procedure. Except where the Court discusses differing testimony on a specific issue, any contrary testimony on that matter has been considered and rejected in favor of the specific fact found. Finally, to the extent that a finding of fact constitutes a conclusion of law, the Court so concludes; to the extent that a conclusion of law constitutes a finding of fact, the Court so finds.

III. FINDINGS OF FACT

4. Trial in this case involved the presentation of the often conflicting testimony of numerous experts on a number of closely related topics. The Court's Findings of Fact, below, are a reflection of the information presented as well as the Court's contemporaneous observation and assessment of the witnesses' credibility. The omission of any particular detail from the below findings of fact should not be construed as the Court's failure to consider that detail or inferences it would support, but rather merely an indication that, in the process of condensing a voluminous record, some details were omitted in the interest of conveying a manageably concise presentation of the relevant evidence and

limiting the Findings of Fact to the details that the Court considered ultimately dispositive.

A. Background

1. General Principles of Hydrology[1]

5. This case is about water. Water comes in various forms and can be found in various places.

6. In its liquid form, water may pool or flow on top of the surface of the earth—for example, in the Cumberland River. Because these bodies of water can be found on the surface of the earth, they are categorized as "surface waters." SURFACE WATER, Merriam–Webster Dictionary (online ed. 2017).

7. Water is also present below the surface of the earth, in what is known as "groundwater." GROUNDWATER, Merriam–Webster Dictionary (online ed. 2017). Liquid groundwater tends to flow through the earth, from places of high elevation to

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[1] Hydrology is "a science dealing with the properties, distribution, and circulation of water on and below the earth's surface and in the atmosphere." HYDROLOGY, Merriam–Webster Dictionary (online ed. 2017). Numerous experts in this matter testified regarding relevant hydrological matters. Although they sometimes differed in their conclusions and terminology, the Court has been able to identify a number of core principles of hydrology that underlie the issues in this case. The Court will present those general principles here in a highly simplified form. The Court's statement of general principles is not intended to disregard or negate any complicating details set forth in individual witnesses' testimony.

places of lower elevation, eventually joining surface waters and flowing to the sea. (See Doc. No. 227–1 (Groves Wr. Test.) at ¶ 27.)

8. Not all earth, though, is created equal when it comes to the flow of groundwater. In some types of earth, such as gravel or loose soil, water may seep broadly through pores. In other types of earth, such as fractured rock, water may instead pass quickly but narrowly through fissures. In yet other types of earth, such as tightly packed clay, water may not pass well at all, because there is no space for the water to occupy. Portions of earth that readily transmit water are called "aquifers." Portions of earth that do not readily transmit water are called "aquitards." Most groundwater environments include a mixture of the two. (See Doc. No. 230–1 (Perry Wr. Test.) at 4–5.)

9. Generally speaking, water that penetrates the earth will, due to the pull of gravity, flow downward until it penetrates what is known as the "water table." (See Doc. No. 227–1 (Groves Wr. Test.) at ¶ 27.) ***783** The water table is the top of an area of earth totally saturated with groundwater. Beneath the water table, at least as relevant to this case, is the continuous flow of groundwater through the earth toward surface waters. (Id.) The particular elevation of the water table in any given area may fluctuate over time in response to precipitation. (See Doc. No. 230–1 (Perry Wr. Test.) at 14.)

10. Liquid or solid water falls to the earth in the form of precipitation—rain, sleet, or snow. If precipitation falls immediately upon a preexisting

surface water, the precipitation will join that surface water. Water that falls upon the earth will either pool there—as surface water—or it will penetrate the earth and join the groundwater. (See Doc. No. 227–1 (Groves Wr. Test.) at ¶ 45.)

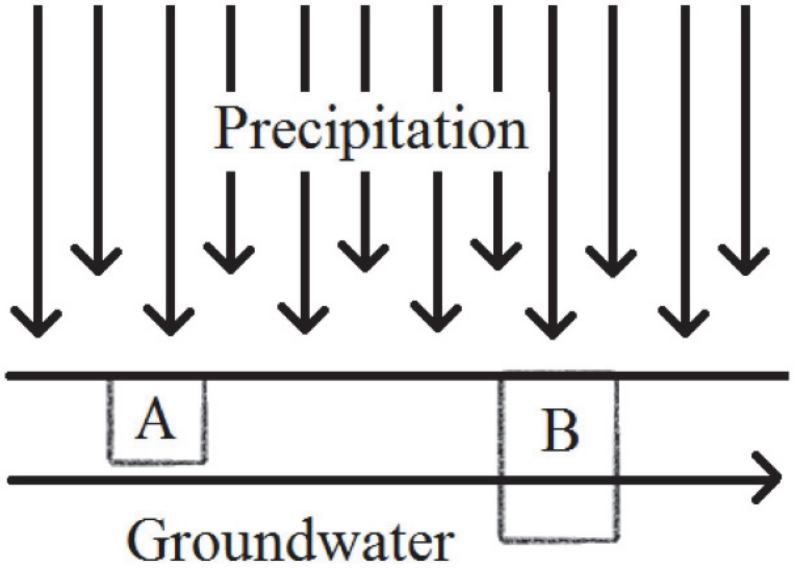
11. As water passes through the earth on its way to surface waters, it may pick up chemicals from the material it passes through and then carry those chemicals with it on its path to surface waters. (See Doc. No. 230–1 (Perry Wr. Test.) at 6.) If the water passes through an area filled with pollutants—for example, a large impoundment of coal ash waste—it may pick up some of those pollutants and then convey them to nearby surface waters.

12. Water that penetrates a particular patch of earth directly from above—such as rain penetrating directly into the earth it fell upon—is said to have penetrated that earth *vertically*. Water that penetrates a particular patch of earth via groundwater flow, on the other hand, is said to have penetrated it *laterally*. Generally speaking, if a particular patch of earth is wholly above the water table, it will be penetrated only vertically, when precipitation falls upon it or immediately near it. If the patch of earth extends past the water table and into a continuous groundwater flow, however, the patch will be penetrated both vertically, by immediate precipitation, and also laterally, by groundwater that could include water that first fell to earth a significant distance away. (See Doc. No. 227–2 (Quarles Wr. Test.) at ¶ 45.)

13. For example, the below figure shows one zone

of earth penetrated only vertically, and one penetrated both vertically and laterally:

***784**



14. Because zone A terminates before breaching the water table, it is penetrated only vertically. Precipitation enters zone A at the surface of the earth, passes through it, then eventually joins the groundwater level below zone A's lower boundary.

15. But because zone B extends past the water table, zone B is penetrated both vertically and laterally. Some water penetrates via precipitation at the surface, then flows down and joins the groundwater. Yet other water, already part of the groundwater flow, penetrates zone B from the side.

16. Although both hypothetical zones are

penetrated by water, and the water from each eventually ends up in the same groundwater flow, a key difference exists in how one might shield the respective zones from future water flow. A simple surface cap would largely protect zone A by blocking precipitation. Pollutants from zone A then would be unlikely to join the groundwater flow in significant levels. A cap alone, however, would not keep out pollutants from zone B, because the cap would do nothing to impede the lateral flow of groundwater through those pollutants, even in the absence of penetration by immediate precipitation. If one truly wished to keep the pollutants from zone B out of the groundwater, one would need to either install a lining around its entire perimeter or permanently excavate the pollutants.

17. In summary, these basic principles form the foundation of this case: (1) water, in the form of precipitation, penetrates the ground and becomes groundwater; (2) groundwater generally flows through the earth toward surface waters that ultimately connect to the sea; (3) as waters pass through the earth, they pick up chemicals, including potentially harmful pollutants, that they then convey to the surface waters; and (4) passage of water through a particularly toxic area can be prevented either by blocking the water or removing the toxins.

2. The Gallatin Plant

18. The Gallatin Plant is a four-unit coal-fired power plant located in Sumner County, ***785** Tennessee, about five miles south of the city of Gallatin on the Odom's Bend Peninsula formed by the Old Hickory Lake portion of the Cumberland

River between River Miles 242.5 and 246. (Doc. No. 226 (J. Stip.) at ¶ 1.) Old Hickory Lake is a reservoir created by the construction of the Old Hickory Lock and Dam. (Id. at ¶ 5.)

19. Odom's Bend Peninsula is situated over some karst geological features, with sinking streams, shallow bedrock, and sinkholes. (Id. at ¶ 17.) The Central Basin, in which the Gallatin Plant is located, is one of several major areas of karst development in Tennessee. (Doc. No. 227–1 (Groves Wr. Test.) at ¶ 32.)

20. The Gallatin Plant commenced operation in 1956. (Doc. No. 226 (J. Stip.) at ¶ 3.)

21. From 1956 until 1970, the Gallatin Plant sluiced coal combustion residual ("CCR") material to a 65–acre surface impoundment on the western edge of the plant site known then as Ash Disposal Areas No. 1 and No. 2 but now typically referred to as the Non–Registered Site. The Non–Registered Site has been out of operation since 1970. (Id. at ¶ 7.)

22. TVA constructed the Non–Registered Site with unlined perimeter containment dikes made of earth and ash. (Id. at ¶ 11.)

23. In the mid–1990s, the Tennessee Department of Environment & Conservation ("TDEC") asked TVA to formulate a closure plan for the Non–Registered Site, which TVA did. (Id. at ¶ 8.) Construction work related to the closure was apparently completed in or around 1998. (Doc. No. 234 (Tr. Day 1) at 192.)

24. Since April 1970, TVA has been sluicing coal ash waste to the approximately 476–acre Ash Pond Complex, which is also unlined. (Doc. No. 226 (J. Stip.) at ¶ 12.) The Ash Pond Complex is located just to the north and to the northeast of the Non–Registered Site along the bank of the Cumberland River. (Id. at ¶ 13.)

25. The Ash Pond Complex consists of the following ponds: Ash Pond A, Ash Pond E, Bottom Ash Pond, Middle Pond A, and a stilling pond complex consisting of Stilling Ponds B, C, and D. In 2015, TVA ceased sluicing ash to Ash Pond E and began dewatering that pond. Stilling Pond D discharges effluent into the Cumberland River at a site known as Outfall 001. (Id. at ¶¶ 14–16.)

3. The Gallatin Plant's Permit

26. On April 30, 1976, the U.S. Environmental Protection Agency ("EPA") issued the first NPDES Permit to TVA for Gallatin (Permit No. TN0005428). (Id. at ¶ 19.) The Tennessee Department of Environment and Conservation ("TDEC"), which now administers Tennessee's NPDES system on delegation from the federal government, re-issued the Gallatin Plant's NPDES Permit No. TN0005428 on January 1, 2006. (Id. at ¶ 21.)

27. In May 2009, TVA submitted to TDEC an application for renewal of Gallatin's NPDES Permit No. TN0005428. TDEC reissued the Gallatin Plant's NPDES Permit No. TN0005428 for a five year period beginning July 1, 2012, and ending May 31, 2017. (Id. at ¶¶ 22–23.) When the permit recently expired, it was administratively continued until the issuance

of a new permit, currently under consideration. (Doc. No. 251 at 2 (citing Tenn. Comp. R. & Regs. 0400–40–05–.05(3)(b)–(4), 0400–40–05–.11(2)).)

28. The current permit expressly authorizes the discharge of coal ash waste from one location, Outfall 001. (J. Ex. 102 at 1.)

29. Part I.A(c) of the NPDES permit, known as the "Removed Substances" provision, provides:

> ***786** Additional monitoring requirements and conditions applicable to Outfalls 001 ... include:
>
> [....]
> c. Sludge or any other material removed by any treatment works must be disposed of in a manner, which prevents its entrance into or pollution of any surface or subsurface waters. Additionally, the disposal of such sludge or other material must be in compliance with the Tennessee Solid Waste Disposal Act, TCA § 68–31–101 et seq. and the Tennessee Hazardous Waste Management Act, TCA 68–46–101 et seq.

(Id. at 11.)

30. Part II.A(4.a) requires TVA to "at all times properly operate and maintain all facilities and systems (and related appurtenances) for collection and treatment which are installed or used by the permittee to achieve compliance with the terms and conditions of the permit." (Id. at 19.)

31. Part II.C.2 creates an obligation to inform

regulators within twenty-four hours of certain events:

> In the case of any noncompliance which could cause a threat to public drinking supplies, or any other discharge which could constitute a threat to human health or the environment, the required notice of non-compliance shall be provided to the Division of Water Pollution Control in the appropriate regional Field Office within 24–hours from the time the permittee becomes aware of the circumstances.

(Id. at 22.)

32. Part II.C.3.b forbids "Sanitary Sewer Overflows" at the Gallatin Plant, which the permit defines as "the discharge to land or water of wastes from any portion of the collection, transmission, or treatment system other than through permitted outfalls." (Id.)

4. Plaintiffs' Notice and State Court Proceedings

33. On November 10, 2014, Plaintiffs, through counsel, issued a 60–day Notice of Violation Letter to TVA, TDEC, and the EPA under the citizen suit provision of the Clean Water Act, 33 U.S.C § 1365 ("CWA" or "Act"), alleging multiple violations of the Act at the Gallatin Plant. See 33 U.S.C §§ 1251–1387. The Notice stated that Plaintiffs intended to file a complaint in federal court against TVA to

enforce requirements of the CWA and the Permit. (Doc. No. 226 (J. Stip.) at ¶ 24.)

34. On January 7, 2015, the State of Tennessee ("State") and TDEC filed an original enforcement action against TVA in Davidson County Chancery Court under applicable state statutes ("State Enforcement Action"). (Doc. No. 13–5 at PageID 320–21.) The complaint in the State Enforcement Action specifically refers to ten seeps from the Ash Pond Complex, and the parties have identified those ten seeps to the Court. (Doc. No. 234 (Tr. Day 1) at 14.).

35. As part of the State Enforcement Action, which remains pending, TVA is in the process of completing and executing an Environmental Investigation Plan ("EIP") that is intended to better investigate and understand the environmental features of the Gallatin Plant site. Plaintiffs, who are intervenors in the State Enforcement Action, as well as TDEC have been involved in the process of reviewing the EIP.

5. Proceedings in this Court

36. Plaintiffs filed their Complaint in this action on April 14, 2015. (Doc. No. 1.)

37. The parties filed various dispositive motions, and on September 9, 2016, the Court issued an Order dismissing Plaintiffs' Claims B and E.a. The Court also dismissed the remaining claims except as ***787** they applied to two sets of allegations: "discharges from the Non–Registered Site into the Cumberland River; and discharges from the Ash Pond Complex via hydrologic flows that are not seeps alone." (Doc.

No. 140 at 1.) Finally, the Court struck Plaintiffs' demand for a jury trial, on the ground that, because TVA is a creature of the federal government, the Seventh Amendment does not guarantee Plaintiffs a right to a jury trial. (Id.)

38. Accordingly, the claims that had not been dismissed were considered by the Court in a bench trial held from January 30 through February 2, 2017. By agreement of the parties and pursuant to Local Rule 39.01(c)(6), direct testimony of expert witnesses was provided in written form, which was accepted into evidence. Key portions of the written testimony were read in Court, after which the expert witnesses were made subject to cross examination.

B. Plaintiffs' Evidence at Trial

1. Testimony of Dr. Chris Groves

39. Dr. Chris Groves holds the position of University Distinguished Professor of Hydrogeology at Western Kentucky University ("WKU"). He has a B.S. degree in Geology and an M.S. degree in Geography from WKU, as well as a Ph.D. in Environmental Sciences (Geology) from the University of Virginia. He is currently serving as a member of the steering committee of the Karst Commission of the International Geographic Union and has amassed a lengthy resume of professional service, honors, grants, and publications indicative of accomplishment and expertise in the field of hydrogeology. (Doc. No. 163–1 (Groves CV).) Groves is licensed as Kentucky Professional Geologist No. 2585. (Doc. No. 227–1 (Groves Wr. Test.) at ¶ 3.)

40. Groves described hydrogeology as the science of how underground water is distributed and how it moves through the soil as soil water, and through rocks beneath the surface as groundwater. (Id. at ¶ 28.)

41. Hydrogeology includes examination of issues related to water quality and how water's chemical composition is impacted by interactions with rocks, gases, biological processes, surface waters, and human sources of contamination. (Id.)

42. Groves testified that he has more than thirty years of professional experience in the study of landscape and aquifer systems, and that this case was the first matter in which he had been retained as an expert witness in a lawsuit or testified in court as an expert witness. (Id. at ¶¶ 2–3.)

43. The parties have stipulated and agreed that Groves is qualified as an expert by knowledge, skill, experience, training, or education pursuant to Federal Rule of Evidence 702. (Doc. No. 221.)

44. Groves stated his opinion that, based on his review of historic maps, borings, and TVA's own internal reports, as well as his own knowledge and understanding of hydrogeological formations in the Central Basin and Odom's Bend Peninsula, he considered the Gallatin Plant coal ash disposal sites "unsuitable for the containment of coal ash." (Id. at ¶ 7.)

45. Specifically, he opined that the Ash Pond Complex does not and cannot effectively contain coal

ash waste, and in particular was constructed on top of highly porous limestone with numerous existing sinkholes and an associated underground karst flow system. He stated that these features permit the waste to migrate into groundwater and to the adjacent and hydrologically connected Cumberland River. (Id. at ¶ 8.)

46. Groves testified that, in his opinion, both the Non–Registered Site and the Ash Pond Complex were constructed at least partially below the water table and are ***788** thus in contact with the groundwater. (Id. at ¶ 9.)

47. Groves testified that, in general, water flows from high areas to low areas of the water table, and that, in this case, the groundwater flows from the peninsula, including from the Ash Pond Complex, to the Cumberland River. (Id. at ¶ 27.) Groves presented a 2012 water table map showing the water table reducing in level from the interior of Odom's Bend Peninsula toward the river, tending to suggest that, generally speaking, water flows radially from the interior of the peninsula to the river, passing through both the Ash Pond Complex and Non–Registered Site. (Id. at ¶¶ 106–07.) Groves noted that TVA's historical documents acknowledged this general groundwater flow pattern numerous times. (Id. at ¶ 110.)

48. He described the Central Basin as a relatively simple geologic setting consisting of nearly horizontal sedimentary rock layers, with each rock layer being distinguishable by various properties, including porosity and permeability. (Id. at ¶ 33.)

The nearly horizontal aquifers that underlie the Central Basin include layers of Carters and Ridley Limestones. Water flows relatively easily through these rocks because, compared to the adjacent layers, they are purer limestones, which dissolve easily and thus contain fractures that have been enlarged by dissolution as groundwater moves through. (Id. at ¶ 35.)

49. Groves discussed in particular an April 2008 document prepared by TVA titled "Final Environmental Impact Statement Rutherford–Williamson–Davidson Power Supply Improvement Project Rutherford Williamson and Maury Counties Tennessee, TVA Project Number 2005–107" ("2008 FEIS"). (Id. at ¶¶ 36–37 (discussing J. Ex. 49)).

50. Groves approvingly cited the 2008 FEIS's statement that, in the Central Basin aquifer system, "most of the groundwater resides in and flows through fractures, bedding planes, small solution openings, and large open conduits." (Id. at ¶ 37 (quoting J. Ex. 49 at 67)).

51. The 2008 FEIS further states that "[l]imestone is susceptible to erosion and dissolution, which produces fissures, sinkholes, underground streams, and caverns forming vast karst areas." (J. Ex. 49 at 67.) It states that the "project area" is located in karst terrain, and that

> [k]arst landforms result from mildly acidic rainwater dissolving bedrock such as limestone or dolostone. Over time,

> these fractures enlarge as the bedrock continues to dissolve. Openings in the rock increase in size, and an underground drainage system begins to develop, allowing more water to pass through and accelerating the formation of underground karst features.

(Id.)

52. Groves testified that in karst landscapes, tributary networks combine with one another, leading to larger and larger flows. (Doc. No. 227–1 (Groves Wr. Test.) at ¶ 39.) Consistently with Groves' assessment, the 2008 FEIS states that

> Groundwater flows from the recharge areas through fractures and conduits and eventually discharges to springs and gaining streams. Large conduits or interconnected conduit systems may consolidate groundwater flow similar to the way surface water flows from small tributaries to larger streams. These interconnected, open conduits (the groundwater conduit system) can transmit water rapidly and can act as important local and regional drains of the groundwater system.

(Id. (quoting J. Ex. 49 at 67).) "Recharge" refers to water that has infiltrated into the ground. (Id. at ¶ 38.)

***789** 53. The 2008 FEIS further observes that "[g]roundwater in karst terrains is readily susceptible to contamination, as the water can travel long distances through conduits with no chance for the natural filtering processes of soil or bacterial action to diminish the contamination.... Karst features in the project area include sinkholes, disappearing streams, reappearing streams (springs), and caves." (J. Ex. 49 at 68.)

54. Groves described the aquifer framework in karst landscapes as "colander-like" due to the abundance of passages through which water can move. (Doc. No. 227–1 (Groves Wr. Test.) at ¶ 41.) He testified that the hydrogeological literature describes many examples of situations where karst limestone aquifers of Tennessee's Central Basin, and the rivers into which they drain, have been polluted by accidental spills and other releases of contaminants. (Id. at ¶ 43.)

55. Groves testified to his opinion, based on his review of literature and case materials, that at the Gallatin Fossil Plant, underground water primarily flows through openings that have been enlarged by the flow of water within the purer limestones. (Id. at ¶ 44.) In particular, the Carters Limestone that underlies the Ash Pond Complex transmits groundwater comparatively easily and rapidly through fractures and other conduits that have been enlarged by dissolution of the limestone bedrock by groundwater flowing through it. (Id. at ¶ 46.)

56. Groves explained that the karst-enabled

drainage in the ash ponds themselves was obscured from view by coal ash waste, but that if the area had not been covered by coal ash waste, one would expect to see rainfall landing on the ground and quickly sinking underground into the highly porous bedrock. (Id. at ¶ 45.)

57. Groves discussed TVA's historical documentation of the geology of the area before TVA built the ash pond disposal sites. The documentation showed numerous limestone sinkholes in the area that is now the Ash Pond Complex. It also showed numerous lineaments—naturally occurring, linear features of the landscape that provide insight into the subsurface fracture patterns and magnitude. (Id. at ¶¶ 48–52.) Based on Groves' review of TVA's map, he concluded that the subsurface fractures in Odom's Bend Peninsula are extensive and would allow water and any waste in the water to drain into the groundwater. (Id. at ¶ 53.) Groves stated that he had never seen any TVA documentation that these fractures were repaired, and that he believed any such repair to be nearly impossible in light of the fractures' extensive nature. (Id.)

58. Based on the foregoing, Groves stated that it was his professional opinion that fractures and related solutionally enlarged conduits under the coal ash disposal areas transport coal ash waste to the groundwater. (Id.)

59. Groves also noted that his review of the Tennessee Cave Survey showed at least nine explorable caves in the area including Odom's Bend Peninsula, and that it was his opinion that because

there are so many caves in this area, there is a high probability that other caves were present on Odom's Bend that have been covered by coal ash waste and slurry water. (Id. at ¶ 55.)

60. Groves next discussed logs of borings performed by TVA and its contractors in the vicinity of the Ash Pond Complex. As Groves read the logs, the borings identified at least seventy "voids" or "apparent voids" in the earth, ranging from 4 to 18.6 feet in height, many of which were connected to the groundwater flow system. (Id. at ¶ 59.)

61. Groves also opined that, based on his review of historical documents, the Ash ***790** Pond Complex was located on top of a sinking stream referred to as "Sinking Creek." Sinking streams are streams that sink underground into the highly permeable limestone beneath and drain through the karst aquifer system to the nearest base level river, in this case the Cumberland River. Groves described sinking streams as among the most classic of karst features. (Id. at ¶¶ 60–65.)

62. Sinking streams disappear underground at "swallets"—holes into which the stream disappears into the subsurface. The water continues flowing underground to the relevant river, here the Cumberland. Groves' opinion, based on the historical documentation, was that the swallets of Sinking Creek are currently underneath the Ash Pond Complex. (Id. at ¶¶ 63–65.)

63. Groves opined that, because the former surface of the valley of Sinking Creek is, based on his

reading, now the base of the Ash Pond Complex, he would assume that the coal ash waste water now moves directly into the subsurface under the Ash Pond Complex to the Cumberland River, just as water moved through the bottom of Sinking Creek to the Cumberland River before it held the Ash Pond Complex. (Id. at ¶ 101.)

64. Groves reviewed numerous TVA findings and reports regarding the groundwater and/or geology around the Gallatin Plant, including reports from 1982, 1987, 1989, 1992, 1999, 2002, and 2009. (Id. at ¶ 68.) He testified that many of the reports reached conclusions supportive of or similar to his own. (Id. at ¶ 69.) For example, the "1982 Groundwater Report" stated, "In the vicinity of Gallatin Steam Plant, most of the surface streams flow a short distance across the ground, then disappear into sinkholes and drain into underground channels in the limestone bedrock." (J. Ex. 44 at 35.)

65. The 1982 Groundwater Report also states that "[w]ater-table elevations are probably within the ash disposal pond." (J. Ex. 44 at 35.)

66. The 1987 Groundwater Report similarly acknowledges that the "[w]ater table is believed to be within the waste pond." (J. Ex. 45 at 27).

67. Groves' review showed that during the early years of the Ash Pond Complex's operation, as TVA does not appear to dispute, the complex suffered significant leakage through hydrological connections to the Cumberland River. (Doc. No. 227–1 (Groves Wr. Test.) at ¶¶ 74–79.) By Groves' estimate,

between April 1970 and December 1978, approximately 27 billion gallons of coal ash wastewater flowed directly from the Ash Pond Complex into the karst aquifer and then into the Cumberland. (Id. at ¶ 79.)

68. Based on his review of TVA studies, Groves believed that this early leakage was occurring through some number of sinkholes—variously reported from between 59, 101, and 111—but that TVA had ultimately been unable to identify the actual number of sinkholes that were leaking. (Id. at ¶ 86.)

69. In 1977, a TVA research engineer produced a report titled "Magnitude of Ash Disposal Pond Leakage Problem—Gallatin Steam Plant" ("1977 Leakage Memorandum"), which discussed TVA's understanding, at the time, of the leakage from the pond. (J. Ex. 41.) The 1977 Leakage Memorandum explains:

> The actual number of sinkholes which are presently leaking to the subsurface cannot be determined without extensive field studies .... Based on examination of topography of the pond which was taken in 1952 (before the impoundment of Old Hickory Lake), 1963 and 1977, several sink holes were wet weather ponds or were termination points for streams that flowed into the area now covered by the pond. Therefore it is ***791** likely that several sink holes in the present ash disposal pond leak to the subsurface.
>
> If the present leaks from the pond were

> plugged and the water level in the pond rose to the elevation of the outfall weir, one or more of another 52 sink holes could begin to leak. In addition, sink holes which are not presently leaking could begin to leak because of increased hydrostatic pressure.
>
> From the previous discussion, it can be concluded that the network of solution cavities and crevices in the groundwater system under the pond is extensive. Therefore, identification of the sink holes which presently leak to this system would require extensive field studies. In addition, plugging the presently leaking sinkholes would give no assurance that other sink holes would not begin to leak, as previously discussed.

(Id. at TVGF_008091–92.)

70. Groves described steps taken to repair the Ash Pond Complex after its early leakage. As Groves described it, some sinkholes under the Ash Pond Complex were plugged, which caused the water level to rise to the outfall. The water rising, however, did not demonstrate that all leaks had been eliminated. The water level rising only meant that the inflow rate into the ponds exceeded the outflow rate. That outflow rate could still have included outflow through karst drainage. (Doc. No. 227–1 (Groves Wr. Test.) at ¶ 89.)

71. TVA's 1992 Groundwater Report echoes the conclusion that rising waters show only a reduction, not necessarily an elimination, of leakage: "Following

the plugging of several sinkholes in the northwest end of the pond in 1978, the leakage rate was reduced and a point source discharge was established at the pond outfall." (J. Ex. 47 at 5.)

72. Based on his review and the foregoing, Groves opined that most of the conduits below the Ash Pond Complex were never plugged or repaired and that, accordingly, coal ash waste is still within the groundwater and likely still flowing into the river. That drainage, however, cannot be directly seen because it is obscured by the coal ash waste itself. (Doc. No. 227–1 (Groves Wr. Test.) at ¶ 90.)

73. Groves' expert opinion was that, given the hydrogeological conditions of Odom's Bend, the evidence of leakage into the Cumberland River, and that groundwater on Odom's Bend Peninsula is expected to flow into the Cumberland River, any suggestion that coal ash waste water is not currently going to the Cumberland River, or is going anywhere other than the Cumberland River, is implausible. (Id. at ¶ 102.)

74. Groves performed an analysis based on historical groundwater flow reports and maps, as well as evidence from nearby ground wells, purporting to demonstrate that there is a major conduit and underground river parallel to, and north of, the axis of the Ash Pond Complex, likely terminating at a flow outlet into the Cumberland River. (Id. at ¶¶ 116–26.)

75. Groves also opined that dewatering and capping the ash disposal areas without a liner will

not prevent contamination of groundwater or the Cumberland River by coal ash waste, because such steps would not eliminate ongoing drainage through karst features. (Id. at ¶ 132.)

76. On cross examination, Groves admitted that he had never personally been on the site of the Gallatin Plant. (Doc. No. 234 (Tr. Day 1) at 53.)

77. Groves further conceded that, in some portions of the Ash Pond Complex, there was a layer of clay between the ash and the karst underneath. (Id. at 65.)

78. TVA pointed out that a 2010 report created for TVA by Stantec Consulting ***792** Services Inc. ("2010 Stantec Report") (J. Ex. 67) included the statement that "[t]he thickness of the native soils above the bedrock across the pond complex range from as little as about one foot or less to as much as twenty feet." (Doc. No. 234 (Tr. Day 1) at 66–67.) Groves acknowledged the statement in the Report, but argued that it was inconsistent with the Report's own data, which showed that there were some places in the Ash Pond Complex where waste was in direct contact with bare rock. (Id. at 67.) TVA also pointed out select borings that showed substantial clay cover at specific locations in the Ash Pond Complex. (Id. at 67–69.)

79. The 2010 Stantec Report also states that the Gallatin Plant "ha[d] not experienced any known ... karst-related problems within the ponds in recent years" other than the following: an area designated for the expansion of Pond E contained known

sinkholes, which were mitigated during construction; a recent rain event had revealed a sinkhole to the north of Pond C; and in 1990, a sinkhole that had previously been isolated by a dike was repaired. (Id. at 70; J. Ex. 67 at 8.)

80. TVA's cross examination also established that there are a number of techniques and mechanisms for identifying the relevant hydrogeology in karst systems that Groves, who relied primarily on historical documentation, did not rely on in this case. (Doc. No. 234 (Tr. Day 1) at 81–86.) On re-direct, Groves explained that he was confident in his conclusions despite not having used such methods. (Id. at 101.)

81. Finally, Groves admitted that the Non–Registered site was not located atop karst features, but rather alluvial deposits, defined as "unconsolidated sediment that has been deposited by a surface stream or river." (Id. at 55–57.)

82. Based on its direct observation of Groves' demeanor, candor, and responsiveness, the Court found Groves to be generally credible. The Court did, however, evaluate Groves' opinions in the context of his having been retained by the Plaintiffs. His opinions, moreover, were rendered somewhat less persuasive because they were based primarily on his review of past literature and general understanding of karst terrains, rather than direct analysis of the coal ash disposal areas themselves. That deficiency, though relevant to the weight of his testimony, did not wholly negate its persuasive and explanatory value.

2. Testimony of Mark Quarles

83. Mark Quarles is a Tennessee-licensed professional geologist with a B.S. degree in Environmental Engineering Technology from WKU. He characterizes himself as a "[p]ublic interest environmental consultant." Quarles testified that he has approximately thirty years of experience as an environmental consultant, including a substantial amount of experience consulting for industrial sector clients. (Doc. No. 227–2 (Quarles Wr. Test.) at ¶¶ 1, 3, 5.)

84. Quarles' consulting company, Global Environmental, LLC, ("Global Environmental") was retained by Plaintiffs to evaluate the conditions of the Gallatin Plant. (Id. at ¶ 1.)

85. Quarles testified that he has been trained in and is experienced in taking samples to determine the existence of and extent of contamination. (Id. at ¶ 3.) He claimed extensive experience evaluating groundwater movement in karst environments, particularly in Middle Tennessee, including work involving sinking creeks and sinkholes. (Id. at ¶ 5.)

86. Quarles also stated that he has many years of experience conducting hydrogeological investigations related to siting and design of municipal and industrial waste landfills, developing closure plans for industrial landfills, designing and implementing ***793** groundwater monitoring programs for industrial landfills, completing investigations to define the nature and extent of industrial contamination in the environment, and completing coal combustion waste investigations. He has

performed coal combustion-related investigations at over seventy sites located in twelve states. (Id. at ¶¶ 6–7.)

87. The parties have stipulated and agreed that Quarles is qualified as an expert by knowledge, skill, experience, training, or education pursuant to Federal Rule of Evidence 702. (Doc. No. 221.)

88. Quarles echoed Groves' assessment that the Sinking Creek stream valley rendered the area of the Ash Pond Complex a poor choice for the disposal of coal ash waste, due to its karst features and the connectivity of the groundwater. (Doc. No. 227–2 (Quarles Wr. Test.) at ¶¶ 9–10.)

89. Quarles gave his opinion that both the Ash Pond Complex and the Non–Registered Site contain coal ash waste that extends below the groundwater level. (Id. at ¶ 12)

90. Quarles testified that Global Environmental was able, through visual inspection and manual probing, to identify solid coal combustion wastes several feet thick in the Cumberland River along the shoreline of both the Ash Pond Complex and the Non–Registered Site. (Id. at ¶ 18.)

91. Quarles' review of historical maps yielded conclusions similar to Groves': that the Gallatin Plan was built on an area of significant karst activity, including sinkholes and sinking streams on the Plant property. (Id. at ¶¶ 32–33.)

92. Quarles also echoed Groves' conclusion that

the Ash Pond Complex was constructed over a sinking stream known as Sinking Creek. (Id. at ¶ 34.)

93. Quarles also identified a large sinkhole complex northeast of the Plant ("Neighboring Sinkhole Complex"). (Id. at ¶ 33.) Quarles opined that, because the Neighboring Sinkhole Complex does not have an obvious resurgence point where any flows reach the ground surface or discharge into a surface water stream, the Neighboring Sinkhole Complex may be connected by groundwater to the Ash Pond Complex. (Id. at ¶ 40.)

94. Quarles discussed the larger drainage basin from which natural precipitation runoff flows through the main discharge channel from the Ash Pond Complex and into the Cumberland River. Quarles cited a 2013 TVA report (J. Ex. 71) for the conclusion that the drainage basin is approximately 4,000 acres, with surface drainage flowing from at least three miles to the North of the Gallatin Plant. (Doc. No. 227–2 (Quarles Wr. Test.) at ¶ 41.)

95. For example, surface water overflow from the Neighboring Sinkhole Complex flows across TVA property, flows into a catch basin,[2] and discharges into the Ash Pond Complex. Quarles provided photographic evidence appearing to depict offsite drainage flowing into the Ash Pond Complex. (Id. at ¶ 43; J. Ex. 73 & 140.)

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[2] A catch basin is "a reservoir or well into which surface water may drain off." CATCH BASIN, Merriam–Webster Dictionary (online ed. 2017).

96. Global Environmental developed conceptual models for both the Non–Registered Site and the Ash Pond Complex, based on 1930 and 1952 topographic maps and the sites' pre-development ground elevations. (Doc. No. 227–2 (Quarles Wr. Test.) at ¶ 44.) Those models were presented in the form of cross-sectional diagrams designed to demonstrate certain features of the sites and relevant hydrogeology. (J. Ex. 141 & 142.) The Court did not construe the models as presenting literal, to-scale representations of the ponds, but ***794** rather as conceptual illustrations intended to assist the Court in its understanding of Quarles' analysis.

97. Quarles testified that, although the conceptual models relied on some information from 1930 and 1952, he believed them to accurately reflect current conditions, in particular with regard to the elevation of the underlying bedrock and the level of the river. Quarles testified that he would not expect those values to have changed in the relevant intervening years. (Doc. No. 235 (Tr. Day 2) at 9–10.)

98. The conceptual model of the Ash Pond Complex depicts, among other things, waste escaping through sinkholes in the bottom of the pond into a conduit flow through the underlying limestone. The model also illustrates coal ash waste below the groundwater elevation as of May 23, 2012. (J. Ex. 141.)

99. The conceptual model of the Non–Registered Site depicts submerged coal ash waste below the groundwater level, and groundwater passing through

the Site to the Cumberland River. (J. Ex. 142.)

100. Quarles' conceptual analysis concluded that the area's elevated aquifer, the hydraulic connectivity of the underlying bedrock to the Cumberland River, and the original ground topography have resulted in solid wastes in both disposal areas that are saturated under natural groundwater and river water flow conditions. (Doc. No. 227–2 (Quarles Wr. Test.) at ¶ 45.) Quarles testified that his review of TVA's historical studies substantiates the conclusions of his conceptual models, in particular his conclusions that ash is buried within the groundwater at both the Ash Pond Complex and the Non–Registered Site; that the groundwater is hydrologically connected to the Cumberland River; and that TVA has discharged and will continue to discharge pollutants from the waste to the river. (Id. at ¶ 61.)

101. Quarles cited the 2010 Stantec Report (J. Ex. 67) and more recent studies performed for TVA by Arcadis U.S., Inc., ("2014 Arcadis Report") (J. Ex. 59) as supporting his conclusion that both the Ash Pond Complex and Non–Registered Site contain coal combustion wastes that are saturated with water. (Doc. No. 227–2 (Quarles Wr. Test.) at ¶¶ 71–72.) The 2010 Stantec Report based its analysis on a geotechnical exploration plan involving borings at more than thirty locations. (J. Ex. 67 at 8.) The 2014 Arcadis Report assessed the Non–Registered Site through a combination of groundwater monitoring wells, soil data, and other hydrogeologic information. (J. Ex. 59 at TVGF_004702.)

102. According to Quarles, that the Non–Registered Site still contains saturated ash forty-five years after waste placement ended demonstrates that groundwater continues to recharge the wastes from topographically and hydraulically upgradient areas that flow into the wastes. (Doc. No. 227–2 (Quarles Wr. Test.) at ¶ 121.)

103. According to Quarles, Arcadis concluded that contaminated groundwater discharges into the Cumberland River along the Non–Registered Site shoreline. (Id. at ¶ 100.)

104. The 2014 Arcadis Report includes a figure titled "Site–Wide Potentiometric Contours" that depicts the "Inferred Flow Direction" of groundwater on Odom's Bend Peninsula. (Id. at ¶ 74 (citing J. Ex. 59 at TVGF_004759 (Fig. 7)).) The figure depicts water flowing from a high point in the center-east of the peninsula toward the river, including passage through both the Ash Pond Complex and the Non–Registered Site areas. The groundwater flows depicted include the flow of water through the Ash Pond Complex area toward a location near or upstream from the sediment sampling locations identified below as East Side 1 and East Side 2. (J. Ex. 59 at ***795** TVGF_004759 (Fig. 7).) Groundwater is also depicted as flowing through the Non–Registered Site in the direction of points near or upstream from the sediment sampling locations identified below as NRS 1 through NRS 6. (Id.)

105. Quarles also summarized the 2014 Arcadis Report's conclusions regarding the Non–Registered Site. Quarles interpreted the Report as concluding

that coal ash waste constituents, often in high concentrations, remain in the Non–Registered Site, migrating towards and beneath the main channel of the Cumberland River. (Doc. No. 227–2 (Quarles Wr. Test.) at ¶¶ 80–81.)

106. On cross examination, however, Quarles conceded that the 2014 Arcadis Report concluded that the uppermost groundwater at the Non–Registered Site occurred in alluvial deposits and residuum soil, not in ash. Quarles explained the conflict between his analysis and Arcadis's as a result of Arcadis having relied on wells around the perimeter of the area, whereas his model relied on wells and borings through the ash. (Doc. No. 234 (Tr. Day 1) at 197–98.)

107. Quarles also conceded that the 2010 Stantec Report had stated that the Plant "ha[d] not experienced any known additional karst-related problems in recent years." (Id. at 200.)

108. Quarles identified a March 2015 PowerPoint presentation by TVA contractor AECOM stating that "[a] portion of the ash [in Ash Pond E] is below (up to 10 feet below) the elevation of the Cumberland River." (Doc. No. 227–2 (Quarles Wr. Test.) at ¶ 73 (citing J. Ex. 113 at 7).) The presentation also acknowledges the possibility that the Pond could be hydrologically connected to the river, and specifically cites the possibility of karst activity, including sinkholes. According to the slide, if the Pond is hydrologically connected to the river, it would be effectively impossible to wholly dewater the Pond due to that connection. (J. Ex. 113 at 7.)

109. Quarles evaluated TVA's groundwater monitoring program. Although he identified a number of what he considered deficiencies in the program, he nevertheless concluded that TVA's monitoring had demonstrated/corroborated contamination of the groundwater with coal ash waste. (Doc. No. 227–2 (Quarles Wr. Test.) at ¶¶ 83–98.)

110. Quarles and Global Environmental also conducted a field investigation, with the cooperation of Barry Sulkin and others. (Id. at ¶ 46.) Quarles and others inspected the shoreline of the Cumberland River along the Gallatin Plant peninsula, looking for signs of coal and coal combustion waste, targeting portions of the shoreline that were (1) hydraulically downgradient of groundwater flow from ash disposal areas; (2) along bedrock joint trend lines that could be preferential groundwater flow pathways; (3) former valleys and hollows that are now fully or partially submerged by the impounded Cumberland River; and/or (4) areas of past impoundment dike failures. (Id.)

111. Global Environmental performed boat-based inspections of identified target sites, including sediment and water sampling, in October 2014 and August 2015. Quarles testified chiefly about the sediment sampling, leaving Barry Sulkin to discuss the water sampling. (Id. at ¶ 50.)

112. Quarles identified fourteen sampling locations, which he characterized as follows:

• **East Side 1**—We observed a diffuse flow spring located on the eastern peninsula at a public boat ramp along the shoreline of the Cumberland River. This site is hydraulically downgradient of the eastern portion of Ash Pond A and along the secondary bedrock joint pattern, and is located ***796** in a pre-impoundment valley. The sample was collected from an opening in a submerged channel in fill material.

• **East Side 2**—We observed a diffuse flow spring also located on the eastern peninsula at the shoreline of the Cumberland River. This site is downgradient of the northeastern portion of Ash Pond A along the secondary bedrock joint pattern and is in the vicinity of former (apparently closed or no longer sampled) well GAF 13—a well with demonstrated coal combustion waste constituents and up to 2,100 mg/L sulfate. The sample was collected where the spring flows into the river.

• **Barton's Creek Reference**—This sample site is located off TVA property south of the Cumberland River along the shoreline of Barton's Creek, an upstream tributary of the Cumberland River. The shoreline sediment sample was collected at the Barton's Creek Boat Ramp, a public boat ramp on the tributary to Old Hickory Lake, located off of Coles Ferry Pike.

• **NRS 4**—This shoreline sediment sample was collected from the small southerly

embayment adjacent to the NRS. It was collected outside of the submerged zone but below the high water mark of the river and within approximately 1 foot of the waterline of the Cumberland River.

• **NRS 3**—This submerged sediment sample was collected approximately 50 feet from the shoreline (approximately 3–foot water depth) from the same southerly embayment adjacent to the NRS. It consisted of an undetermined mixture of black sludge-like material and mud sediments that was at least 2 feet thick.

• **NRS 2**—This shoreline sample was collected from the southerly embayment adjacent to the NRS, but from the area nearest well 27. It consisted of a coarse, reddish-brown to black, clayey sand. It was collected outside of the submerged zone but below the high water mark and within 1 foot of the waterline of the Cumberland River.

• **NRS 1**—This submerged sample (approximately 3–foot water depth) was collected in the northerly embayment adjacent to the NRS, located approximately 10 feet from the shoreline. Consisted of an undetermined mixture of black sludge-like material and mud sediments that was at least 2 feet thick.

• **APC 1**—This western shoreline sample was collected adjacent to a rip-rap[3] repair of Ash

[3] "Rip-rap" or "riprap" is "a foundation or sustaining wall of stones or chunks of concrete thrown together without order (as

Pond E. It was collected outside of the submerged zone but below the high water mark of the Cumberland River.

• **APC 4**—This submerged sample (approximately 3–foot water depth) was collected approximately 75 feet from the shoreline adjacent to Ash Pond E. It consisted of black sludge-like material that was at least 2 feet thick.

• **NRS 5**—This submerged sample (approximately 3–foot water depth) was collected from the northerly embayment near "NRS 1" sample. It is located approximately 60 feet from the shoreline near the barge unloaded conveyor belt. The sample consisted of black sludge-like material.

***797** • **NRS 6**—This submerged sediment sample was collected approximately 20 feet from the shoreline (approximately 1.5 foot water depth) of the NRS. It consisted of a black sludge-like material that was at least 4 feet thick.

• **APC 2**—This submerged sediment sample was collected approximately 40 feet from the shoreline of the Ash Pond Complex (approximately 3 to 4 feet of water). It consisted of a black sludge-like material that was approximately 2 feet thick.

• **NRS 1a**—This submerged sediment sample

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in deep water)." RIPRAP, Merriam–Webster Dictionary (online ed. 2017).

> was collected approximately 50 feet from the eastern shoreline (approximately 3 to 4 feet of water) of the northwest corner of the NRS and south of the Ash Pond Complex barge conveyor. It consisted of a black sludge-like material that was at least 2 feet thick.
>
> • **NRS 4a**—This submerged sediment sample was collected from the small embayment along the south end of the NRS (approximately 1.5 feet of water). It consisted of black sludge-like material that was mixed with tan silt. The black sludge was at least 2 feet thick.

(Id. at ¶ 51.) The locations of the sampling sites were identified for the Court on the Agreed Map filed by the parties for use at trial, as were the locations of the ten seeps referred to in the complaint in the State Enforcement Action. (Doc. No. 220–1.) APC 1, APC 2, and APC 4 were in the general vicinity of two seeps at issue in the State Enforcement Action. (Id.)

113. The samples were analyzed for constituents considered to be good indicators of the presence of coal ash waste. Quarles conceded that the sampling program was designed to identify the presence of contamination, not to measure the extent of that contamination. (Doc. No. 227–2 (Quarles Wr. Test.) at ¶ 55.)

114. Quarles testified that constituents that are commonly associated with coal combustion wastes were detected in all solid waste and sediment samples that were collected from the eastern, southern, and western portions of the peninsula.

Those indicators included silicon, boron, manganese, sulfate, iron, aluminum, barium, calcium, chromium, strontium, arsenic, chloride, cobalt, lithium, selenium, sodium, and sulfur. (Id. at ¶ 57.)

115. By way of example, East Side 1—located to the east of Ash Ponds A and B, not in the vicinity of any of the ten seeps mentioned in Tennessee's State Enforcement Action complaint—exhibited what Quarles identified as elevated levels of aluminum, barium, boron, lithium, sodium, strontium, and sulfur. Among other chemicals, East Side 1 showed a boron concentration of 52 mg/kg, whereas the Bartons Creek Reference sample showed a boron concentration of <1.3 mg/kg. (Id. at ¶ 58.)

116. East Side 2—located downstream from East Side 1 and to the southeast of Ash Pond A, not in the vicinity of any of the ten seeps mentioned in Tennessee's State Enforcement Action complaint—exhibited what Quarles identified as elevated levels of aluminum, barium, boron, chromium, iron, lithium, manganese, and strontium. For example, the Bartons Creek Reference sample showed a manganese concentration of 360 mg/kg, whereas East Side 2 showed a manganese concentration of 700 mg/kg. (Id.)

117. NRS 4—located immediately adjacent to the Non–Registered Site, not in the vicinity of any seep mentioned in the State Enforcement Action complaint—exhibited what Quarles identified as elevated levels of arsenic, barium, boron, iron, sulfur, and sulfate. For example, the Bartons Creek Reference sample showed an iron concentration ***798**

of 26,000 mg/kg, whereas NRS 4 showed an iron concentration of 230,000 mg/kg. (Id.)

118. The other sampling locations similarly showed what Quarles identified as elevated levels of chemicals tending to indicate the presence of coal ash waste. The particular chemicals present in elevated levels and not present in elevated levels varied from location to location. (Id.) Boron, however, was present at elevated levels in all of the Gallatin Plant shoreline sediment samples, but was virtually nonexistent in the Bartons Creek Reference sample. Arsenic concentrations from the TVA shoreline samples were higher than the reference sample in over two-thirds of the on-site sediment samples. (Id. at ¶ 59.)

119. Sulfate concentrations from TVA shoreline samples were, in some instances, up to 180 times higher than the reference sample. Sulfur concentrations from TVA shoreline samples were, in some instances, up to 15 times higher than the reference sample. Iron concentrations from TVA shoreline samples were, in some instances, up to 10 times higher than the reference sample. (Id.)

120. Quarles also presented February 2015 aerial photography depicting reddish-brown coloration in the Cumberland River adjacent to the Non–Registered Site. Quarles testified that such coloration can be indicative of coal combustion waste contaminants. (Id. at ¶ 49 & J. Ex. 78.)

121. Quarles concluded, based on the sediment sampling, that coal ash waste has been released from

the Gallatin Plant at areas adjacent to both the Ash Pond Complex and the Non–Registered Site. (Doc. No. 227–2 (Quarles Wr. Test.) at ¶ 60.)

122. Quarles testified that he had reviewed and agreed with the written testimony of Groves and Sulkin. (Doc. No. 235 (Tr. Day 2) at 7.).

123. On cross examination, Quarles conceded that his sampling could not determine how long the materials he obtained had been in the river or how they reached the river. (Doc. No. 234 (Tr. Day 1) at 186.)

124. Quarles also conceded that the flows he observed at East Side 1 and 2 were exiting to the river through porous soil, as opposed to a bedrock conduit visible from his vantage point. (Id. at 186−87.) He further conceded that he had previously referred to those locations as "seeps." (Id. at 187-88.)

125. Regarding the Non–Registered Site, Quarles conceded that sampling locations NRS 2 and 6 were in the vicinity of a documented 1974 escape of coal ash. (Id. at 191.)

126. TVA also directed Quarles to a 1978 TVA memorandum discussing the repairs to the leaking Ash Pond Complex, which stated, "No correlation between the [water] levels or with rainfall could be found since early June 1978, apparently indicating that no hydraulic connection between the pond and the river presently exists. Similar data obtained for August 1977 (prior to the repair work) showed a strong correlation between pond and lake water

levels." (J. Ex. 89 at TVA_GAF_0011333.) Quarles conceded that he did not include that conclusion in his testimony. (Doc. No. 234 (Tr. Day 1) at 207.).

127. Similarly, a 1979 letter from the Director of Power Production for either TVA or the Plant, describing the 1978 repairs, claimed that "all the holes or low areas where leakage might be suspected were filled with either rock and clay or coarse ash or a combination of these materials," and that ultimately "the progressive rising of the water ... leads us to believe the complete sealing of the pond has been achieved." (J. Ex. 88 at TVA_GAF_0011330.) The same letter did, ***799** however, acknowledge the need to "closely watch the pond for any signs of further leakage." (Id. at TVA_GAF_0011331.) Quarles conceded that he did not acknowledge the letter's assessment in his testimony. (Doc. No. 234 (Tr. Day 1) at 207.). On re-direct, he went into more detail and echoed Groves' assessment that the 1978 repairs would have been inadequate to prevent additional sinkholes from forming. He also suggested that water could potentially bypass the repairs. (Doc. No. 235 (Tr. Day 2) at 20–21.).

128. Finally, Quarles conceded that he had, in the past, used derogatory language to refer to TVA and its attitude toward its environmental stewardship, including characterizing one TVA statement as suggesting TVA personnel were "[e]ither ... idiots or ... lying." (Doc. No. 234 (Tr. Day 1) at 214.) TVA also sought to undermine Quarles' credibility with citation to details surrounding other litigation in which he was involved, but, without

sufficient context, the Court was unable to give significant weight to that evidence. (Id. at 220–28.)

129. Based on its direct observation of his demeanor, candor, and responsiveness, the Court found Quarles to possess some credibility, albeit with the caveats that (1) the Court considered his opinions in the context of his having been retained by Plaintiffs in this matter, and (2) the Court acknowledges Quarles' apparent history of frustrations with and hostility toward TVA. The Court also notes that TVA demonstrated that Quarles' testimony failed to cite some aspects of TVA's historical studies and records that could be read as undermining aspects of his conclusions. Quarles' omissions, though relevant to the credibility and completeness of his opinions, did not wholly undermine his conclusions. Given the extensive nature of TVA's historical documentation, it is not necessarily fatal that his analysis failed to include all relevant citations.

130. TVA did not significantly undermine or contradict Quarles' testimony that his sediment tests established the presence of heightened concentrations of chemicals associated with coal ash waste.

3. Testimony of Vojin Janjic

131. Vojin Janjic is a manager of the water-based systems unit of TDEC. Janjic's responsibilities include overseeing the preparation and review of NPDES permits. (Doc. No. 235 (Tr. Day 2) at 30–31.).

132. Janjic received his chemical engineering

degree from the University of Belgrade before studying environmental and water resources at Vanderbilt University. After completing his education, Janjic began work at TDEC, where he did field work for four years before moving to the agency's central office. (Id. at 31.)

133. Janjic testified that he has been involved in the evaluation and issuance of thousands of NPDES permits. (Id. at 33.)

134. Janjic described the permitting process for NPDES permits issued to individual permittees. The applicant first submits an application based on EPA-designed forms providing the required information to begin the permit application process. TDEC then prepares a draft permit, which it publishes publicly for comments. A permit is accompanied by a permit rationale, a separate document that explains TDEC's process and reasoning for the terms of the permit. If there are public comments in response to the draft permit, TDEC issues an addendum to rationale, which summarizes and responds to the comments, and makes any permit revisions that it deems necessary or justified based on the comments. (Id. at 33–34.)

135. Janjic testified that the rationale and addendum to rationale do not modify ***800** the terms of the permit. Rather, they merely describe the process and basis for the permit. (Id. at 35.) On cross examination, in particular, Janjic repeatedly stressed that the addendum to rationale was distinct from the permit and was not itself an "enforceable" legal document, but rather merely an explanation of

the reasoning and process behind the actually enforceable terms of the permit. (Id. at 56.)

136. The Gallatin Plant's most recent NPDES Permit went into effect on July 1, 2012, and was set to expire on May 31, 2017. (J. Ex. 102 at 001.) Its previous permit had gone into effect on January 1, 2006, and was set to expire on November 29, 2009 (J. Ex. 136 at TSRA–GAF011526), but the terms of the permit were administratively continued from November 29, 2009, until the effective date of the 2012 permit (Doc. No. 235 (Tr. Day 2) at 38).

137. Janjic was involved in reviewing TVA's permit renewal application for the Gallatin Plant, as well as drafting the permit itself. (Id. at 36.)

138. Janjic described generally the waste treatment anticipated to be performed at the Ash Pond Complex under the permit. Water mixed with coal ash waste is sluiced to the Complex. As it passes through the Complex, a process of settling occurs, whereby coal ash constituents settle out of the water. Finally, water is released at Outfall 001—the only outfall identified by the NPDES permit as being authorized for the discharge of coal ash wastewater. (Id. at 39–40.) Neither the 2012 nor the 2005 version of the permit authorizes discharge of coal ash wastewater from anywhere other than Outfall 001. (Id. at 41–42, 48.)

139. It is undisputed that the leaks and seeps at issue in this case are not discharges from Outfall 001.

140. Janjic was asked how, if at all, the 2012 permit addresses the issue of seeps. Janjic pointed to a section of the permit labeled "Other Requirements," and its subsection labeled "Dike Inspections." (J. Ex. 102 at 025.) That subsection requires daily inspections including "observations of dams, dikes, and toe areas for obvious changes in erosion, cracks, or bulges, subsidence, seepage, wet or soft soil, changes in geometry, the depth in the elevation of the impounded water, sediment or slurry, freeboard, changes in vegetation such as overly lush, obstructive vegetation and trees, outlet controls, drains, and any other further changes which may indicate a potential compromise to impoundment integrity." (Id. at 026.) Janjic characterized this requirement as at least in part directed toward identifying and addressing seeps. He explained that seeps raise two sets of concerns: first, that they could signify a compromise of the structural integrity of the impoundment; and second, that the seeps themselves could negatively affect water quality. (Doc. No. 235 (Tr. Day 2) at 43–45.)

141. The 2012 permit requires TVA to begin remediation procedures within twenty-four hours of discovering changes that indicate a potential compromise of the structural integrity of the impoundment. (J. Ex. 102 at 026.)

142. The 2006 permit was less demanding with regard to self-inspection, requiring TVA only to visually inspect the dikes for seepage on at least a quarterly basis. (J. Ex. 136 at TSRA–GAF011550.)

143. Janjic was asked whether he considered

either permit to authorize discharges from seeps. He responded first that the permit speaks for itself, but added that the permits do not permit any "discharges from seeps that would be discernible flow of water." (Doc. No. 235 (Tr. Day 2) at 46–48.)

144. Janjic did testify, however, that "[e]very impoundment that is not [a] lined impoundment is going to have a certain ***801** amount of seepage .... So we realize that any earthen impoundment[s] are going to have a certain amount of seepage." Janjic added, though, that "that seepage per se is not authorized or identified in an NPDES permit." (Id. at 48.)

145. On cross examination, Janjic confirmed that, when the 2012 permit was issued, TDEC was aware that the Ash Pond Complex experienced seeps. (Id. at 55.)

146. Janjic testified that the anticipated seepage to which he referred did not include flows through sinkholes and fissures. (Id. at 49.) He testified that the seepage foreseen at the time of the 2012 permit's issuance was de minimis, with inconsequential impacts. (Id. at 62.)

147. Janjic was asked about Part I.A(c) of the 2012 permit, which addresses removal of sludge or other materials removed from treatment works. (J. Ex. 102 at 011.) He confirmed that the "sludge" referred to included coal ash that settled as part of the ash pond process, and that the 2006 permit contained a similar provision. (Doc. No. 235 (Tr. Day 2) at 49–50.)

148. Janjic was next asked about the sanitary sewer overflow provision of the 2012 permit, Part II.C(3.b). (J. Ex. 102 at 022.) Janjic explained that, in the context of the Gallatin Plant, that provision referred to "any wastewater at the facility that is authorized by this permit." (Doc. No. 235 (Tr. Day 2) at 51–52.) He conceded that the definition of the term as used in the Gallatin Plant's permit differs from the definition used in the EPA's NPDES Permit Writers' Manual (J. Ex. 251), which is narrower. (Doc. No. 235 (Tr. Day 2) at 265.)

149. On cross examination, Janjic was asked about the Non–Registered Site. Janjic testified that the Non–Registered Site and the closed ash disposal area therein are "not a part of the NPDES permit." (Id. at 57.) He agreed, though, that if the Non–Registered Site hypothetically discharged pollutants into navigable waters, that discharge would need to be authorized by TDEC. (Id. at 57–58.)

150. The 2012 addendum to rationale, in response to a comment, states, "Seepage is more similar to a nonpoint source discharge, as it is diffused over a wide area." It is difficult to tell from the statement whether TDEC is referring to seepage from the Ash Pond Complex, seepage from the Non–Registered Site, or seepage generally. (J. Ex. 102 at 048.)

151. Based on its direct observation of his demeanor, candor, and responsiveness, the Court found Janjic to be credible and to credibly present his understanding of TVA's permits and the permitting

process.

4. Testimony of Barry Sulkin

152. Barry Sulkin is a self-employed environmental consultant. He holds a B.A. from the University of Virginia with a major in Environmental Science, and an M.S. in Environmental Engineering from Vanderbilt University. Sulkin has worked as a consultant for over twenty-five years, prior to which he held several positions at the Tennessee Department of Health and Environment (now TDEC), including statewide manager of enforcement investigations for the Division of Water Pollution Control. (Doc. No. 161–1 (Sulkin CV) at 1–3.) He has amassed numerous publications on topics related to water pollution. (Id. at 5–9.)

153. Sulkin testified that he has significant experience and expertise in collecting and evaluating water samples. (Doc. No. 227–3 (Sulkin Wr. Test.) at ¶¶ 11–12.)

154. He also has significant training and experience related to the NPDES permitting system. (Id. at ¶¶ 13–14.)

155. Sulkin was retained by Plaintiffs to perform water and sediment sampling, as ***802** well as provide his opinion, in this case. (Id. at ¶ 1.)

156. The parties have stipulated and agreed that Sulkin is qualified as an expert by knowledge, skill, experience, training, or education pursuant to Federal Rule of Evidence 702. (Doc. No. 221.)

157. Sulkin took part in the collection of water and sediment samples on various dates from May 7, 2014, to August 3, 2016. He testified that all samples were collected in accordance with standard and customary state and EPA protocols for investigating leaking waste or unpermitted discharges. Samples were collected in laboratory-provided containers, with supplied preservatives included as specified by the lab. (Doc. No. 227–3 (Sulkin Wr. Test.) at ¶¶ 18–19.)

158. The purpose of Sulkin's sampling was to identify the existence and composition of leaks—not, for example, to determine the ambient water quality of the Cumberland River as a whole. Accordingly, samples were taken at locations close to the suspected leaks. Sulkin identified this as the proper protocol for his stated objective. (Id. at ¶ 21.)

159. Sampling locations were identified by analysis of historic maps and drainage patterns, as well as visual observations and conductivity readings. Conductivity—that is, the ability of water to pass an electrical current—is an indication of mineral or pollutant content of water, and commonly used as a reliable scientific method to identify potential areas of contamination such as from the ash disposal areas. Sulkin described the visual observations that led to sampling as the presence of an observable flowing discharge, wet soil, and discolored water or sediment. (Id. at ¶¶ 33–36.)

160. Sulkin testified that background or uncontaminated areas generally have conductivity in

the range of 50 to 250 µS/cm,[4] while water contaminated by an ash waste discharge would have conductivity of greater levels. (Id. at ¶ 38.)

161. Sulkin's characterization of the relationship between an NPDES permit and its rationale mirrored Janjic's: in particular, that the permit is binding and not modified by the rationale. (Id. at ¶ 61.)

162. Sulkin first discussed sampling he performed at locations identified as APC 1 and APC 2. APC 1 and 2 are on the western bank of the peninsula adjacent to Pond E, near two seeps identified as part of the State Enforcement Action. (Id. at ¶ 62.) Sulkin has provided a photo of APC 2 (J. Ex. 10) that he characterizes as depicting a discharge into the river. (Doc. No. 227–3 (Sulkin Wr. Test.) at ¶ 63.)

163. As part of his sampling, Sulkin took a baseline conductivity reading at a location across the river, away from any alleged coal ash discharges, and found a conductivity of 209 µs/cm. The conductivity at APC 1 was 768 µs/cm, and at APC 2 was 1,019 µs/cm. (Id. at ¶¶ 63–64.) Later testing showed still elevated, but lower, conductivity levels. (Id. at ¶ 65.)

164. Eventually, after Plaintiffs filed their 60–day notice of violation in this case, TVA apparently covered the allegedly visible discharge at APC 2 with rip-rap. Sulkin's expert opinion was that this

[4] Microsiemens per centimeter. A Siemens is a unit of electric conductance. SIEMENS, Merriam–Webster Dictionary (online ed. 2017).

coverage did not stop the discharges, but instead merely made them harder to document and observe. (Id. at ¶¶ 66–67.) Testing showed continued elevated conductivity near the rip-rap cover. (Id. at ¶ 67.) When cross-examined about his assessment of the addition of the rip-rap, however, Sulkin conceded that he was not a professional engineer. (Doc. No. 235 (Tr. Day 2) at 122.)

***803** 165. Sulkin tested a third site in that general vicinity, APC 3. APC 3 was further from the shore and corresponded with a cloudiness and white coloration observed by Sulkin. (Doc. No. 227–3 (Sulkin Wr. Test.) at ¶ 65.)

166. Constituent testing from APC 1, 2, and 3 showed numerous chemicals suggestive of coal ash contamination at levels above background values, including several at APC 2 that exceeded TDEC's Domestic Water Supply Criterion. (Id. at ¶ 71; Pl. Ex. 1.) Background values were calculated using the average values of publicly available state data from two water quality monitoring stations located 19.9 miles upstream of the Gallatin Fossil Plant. (Doc. No. 227–3 (Sulkin Wr. Test.) at ¶ 71.) TDEC has conducted regular testing to determine the ambient water quality of the Cumberland River, including the Old Hickory Lake area. (Id. at ¶ 41.)

167. A May 7, 2014 sample from APC 1 showed the following contaminants at levels elevated compared to background: chloride, cobalt, iron, manganese, nickel, sulfate, and vanadium. An APC 2 sample from the same date showed elevated levels of chloride, cobalt, iron, manganese, nickel, and sulfate.

(Id. at ¶ 74.)

168. An August 25, 2014 sample from APC 2 showed even greater evidence of contamination, with elevated levels of aluminum, arsenic, barium, cadmium, calcium, chloride, chromium, cobalt, copper, iron, lead, magnesium, manganese, nickel, selenium, sodium, sulfate, thallium, vanadium, and zinc. Of these, arsenic, barium, cadmium, lead, nickel, selenium, and thallium all exceeded TDEC's Domestic Water Supply Criterion. (Id. at ¶¶ 76–77.)

169. For example, water upstream from the plant showed an average arsenic concentration of 0.00045 mg/L. The Domestic Water Supply Criterion for arsenic is 0.01 mg/L. Sampling at APC 2 on August 25, 2014, showed arsenic at a concentration of 0.13 mg/L, thirteen times the criterion level. (Pl. Ex. 1.)

170. At sample location APC 3 on August 25, 2014, the following parameters exceeded background levels: aluminum, arsenic, barium, cadmium, chloride, chromium, cobalt, copper, iron, lead, magnesium, manganese, molybdenum, sodium, sulfate, and zinc. (Doc. No. 227–3 (Sulkin Wr. Test.) at ¶ 78.)

171. Most recently, on August 3, 2016, a sample collected adjacent to the rip-rap that had been placed over top of the visible discharge identified as location APC 2 contained the following parameters above background: aluminum, antimony, arsenic, barium, calcium, chloride, cobalt, copper, iron, lead, manganese, nickel, sodium, sulfate, vanadium, and zinc. (Id. at ¶ 79.)

172. Samples taken from East Side 1 and East Side 2 also showed elevated levels of several contaminants. An August 25, 2014 sample from East Side 1 showed concentrations of the following contaminants in excess of the average upstream background levels: aluminum, arsenic, barium, calcium, chloride, chromium, cobalt, copper, iron, lead, magnesium, manganese, molybdenum, nickel, sodium, sulfate, vanadium, and zinc. Compared to background levels, a sample taken from East Side 2 on the same date showed elevated levels of arsenic, calcium, chloride, manganese, and molybdenum. (Pl. Ex. 1.)

173. For example, the East Side 1 sample showed an arsenic concentration of 0.0019 mg/L, over four times the background average of 0.00045 mg/L. The East Side 2 sample showed an arsenic concentration of 0.001 mg/L, over twice the average upstream level. (Id.)

174. Sulkin testified that, in his expert opinion, the surface water samples and the sediment samples from the waters adjacent ***804** to the Ash Pond Complex demonstrate continuing leakage from the ash storage facilities at the Ash Pond Complex. (Doc. No. 227–3 (Sulkin Wr. Test.) at ¶ 83.)

175. He also testified that, in his expert opinion, this leakage is not the result of a slow seep from the walls of the ash ponds, but rather is the continuing flow of drainage and waste water through the natural drainage channel of Sinking Creek and outlets of the former Sinking Creek embayment of

the lake, as well as through discharge of contaminated groundwater to the river. (Id. at ¶ 84.) On cross examination, however, Sulkin conceded that he was not a geologist or expert on karst. (Doc. No. 235 (Tr. Day 2) at 112.)

176. Sulkin testified that he considered the leaks from the Gallatin Plant's coal ash storage facilities to be a significant threat to public drinking water, because there is a drinking water facility a mile and a half down river from the Plant. (Doc. No. 227–3 (Sulkin Wr. Test.) at ¶ 86.) He also testified that the Old Hickory Lake area is heavily used for recreation. (Id. at ¶ 40.)

177. In addition to the sampling from the Cumberland River, Sulkin reviewed groundwater monitoring reports from four groundwater monitoring wells in the vicinity of the Ash Pond Complex, identified as wells 17, 23, 24, and 25. (Id. at ¶ 92.) Sulkin testified that, based on TVA's reports, all four of these wells are downgradient of the groundwater flow from the Ash Pond Complex. (Id. at ¶ 94.)

178. Sulkin testified that TVA's historical groundwater monitoring data showed elevated levels of several chemical indicators in each of the wells. (Id. at ¶¶ 94–97; see Pl. Ex. 2.)

179. Sulkin, TVA, and TDEC took part in joint sampling of the wells in July and September of 2015. This testing also showed elevated contaminant levels that, in Sulkin's opinion, were indicative of groundwater contamination. (Doc. No. 227–3 (Sulkin

Wr. Test.) at ¶ 98; see Pl. Ex. 3.)

180. Data from offsite drinking wells was, in Sulkin's analysis, similarly corroborative of groundwater contamination. (Doc. No. 227–3 (Sulkin Wr. Test.) at ¶¶ 103–08; see Pl. Ex. 3.)

181. Like Quarles, Sulkin testified that aerial photography of the Cumberland River near the Non–Registered Site showed coloration indicative of coal ash contamination. (Doc. No. 227–3 (Sulkin Wr. Test.) at ¶ 115.)

182. In February of 2015, Sulkin performed water and sediment sampling at NRS 1 and NRS 4, adjacent to the Non–Registered Site. He sampled NRS 4 and NRS 6 in August of 2016. (Pl. Ex. 1.) Sulkin compared the constituent levels in the water samples to the same upstream values he used for his analysis of the samples taken from adjacent to the Ash Pond Complex. (Doc. No. 227–3 (Sulkin Wr. Test.) at ¶ 122.)

183. NRS 1, 4, and 6 all had several contaminants in concentrations greater than the upstream average. The 2015 NRS 4 sample also had lead in a concentration exceeding the domestic water supply criterion. (J. Ex. 1.)

184. The 2015 NRS 4 sample showed the following contaminants at levels above the comparison level: aluminum, arsenic, barium, beryllium, calcium, chromium, cobalt, copper, iron, lead, magnesium, manganese, nickel, sodium, sulfate, vanadium, and zinc. The sample level for

aluminum was 10 mg/L—100 times the average background level. (Doc. No. 227–3 (Sulkin Wr. Test.) at ¶ 124.)

185. A 2016 NRS 4 sample showed the following contaminants at levels above the comparison level: aluminum, antimony, calcium, cobalt, copper, iron, magnesium, ***805** manganese, nickel, selenium, sulfate, and zinc. (Id. at ¶ 125.)

186. The 2016 NRS 6 sample showed the following contaminants at levels above the comparison level: aluminum, antimony, arsenic, barium, calcium, copper, iron, manganese, vanadium, and zinc. (Id. at ¶ 126.) Sulkin also examined material from the river bottom at NRS 6 with a microscope. He observed cenospheres, which he testified demonstrated the presence of coal ash in the river. (Id. at ¶¶ 129–30.) On cross examination, however, Sulkin conceded that he had offered no opinion with regard to when that ash was deposited. (Doc. No. 235 (Tr. Day 2) at 115.)

187. Sulkin's expert opinion was that the elevated contaminant levels in the River adjacent to the Non–Registered Site were the result of continuing discharge of contaminated groundwater into the river or of possible direct discharge into the Cumberland River from the Site. (Doc. No. 227–3 (Sulkin Wr. Test.) at ¶ 144.)

188. Sulkin also reviewed TVA's groundwater monitoring data for the area surrounding the Non–Registered Site and took part in further groundwater sampling. The sampling found a number of

contaminants in levels higher than TVA's comparison wells. (Id. at ¶¶ 138–39.)

189. Sulkin's expert opinion was that the elevated contaminant levels in the groundwater surrounding the Non–Registered Site were the result of leaks and discharges from the unlined sides and bottom of the Site. (Id. at ¶ 143.)

190. On cross examination, Sulkin conceded that, prior to the Court's ruling that it would not consider claims based on purely seep-based discharges, he had referred to his sampling locations as "seeps." By the time of trial, he did not use that terminology. Sulkin explained that he had been using "seep" to refer generically to discharges. (Doc. No. 235 (Tr. Day 2) at 114–15.) Although the Court notices this discrepancy, it also notes that, prior to the Court's ruling, there had been little reason for Plaintiffs' experts to draw express distinctions between discharges that were seeps alone and those that were not. Accordingly, the Court finds Plaintiffs' experts early use of imprecise terminology relevant but not dispositive. The Court also notes that, as TVA itself has emphasized, Sulkin is not a geologist or expert in karst.

191. TVA's cross examination also focused on Sulkin's decision to use "judgmental sampling"—targeted sampling based on professional judgment—as opposed to "probabilistic sampling," which would have been more conducive to drawing broad inferences from the resultant data, such as inferences about the general ambient water quality of the river in the relevant area. Sulkin explained

that he had used his professional judgment to design a sampling methodology with his particular objective—identifying discharges—in mind. (Id. at 118–20.) The Court found Sulkin's explanation convincing, but notes that that explanation does significantly limit the uses to which his sampling can be put. Because Sulkin's samples were targeted and not part of a probabilistic model, they provide only snapshots of particular moments and particular locations on the river.

192. Based on its direct observation of his demeanor, candor, and responsiveness, the Court found Sulkin to be generally credible, albeit with the caveat that the Court considered his opinions in the context of his having been retained by Plaintiffs in this matter. The Court also noted that TVA effectively demonstrated that Sulkin's sampling strategy was targeted at the narrow purpose of identifying or confirming leaks, and therefore provided limited basis for drawing conclusions about ***806** the extent or severity of the leaks, or their effect on the water quality of the river.

5. Testimony of Albert Hudson, Jr.

193. Albert Hudson, Jr., is a retired pipefitter living on Odom's Ben Road, near the Gallatin Plant. He testified that he relies on well water. Hudson testified that he was made aware that his well had become contaminated and would require filtration. (Doc. No. 235 (Tr. Day 2) at 125–30.) The Court found Hudson credible, although his testimony had minimal relevance to the contested issues in this case.

6. Testimony of Dr. Avner Vengosh

194. Dr. Avner Vengosh is a tenured professor in the Division of Earth and Ocean Sciences of the Nicholas School of Environment at Duke University, where he teaches courses including Introduction to Hydrogeology and International Water Resources. He holds a Ph.D. in Environmental Geochemistry from Australian National University and previously received M.Sc. and B.Sc. degrees from Hebrew University of Jerusalem. He serves on the editorial board of the international journal *Environmental Science and Technology* and as an associate editor of the international journal *Applied Geochemistry*. (Doc. No. 160–1 (Vengosh CV) at 1–2, 24.) Vengosh has amassed a body of honors, grants, and publications indicative of significant expertise in the fields of hydrogeology, geochemistry, and environmental science. (Id. at 2–29.)

195. Vengosh was asked by Plaintiffs to provide analysis and opinion related to this proceeding. Vengosh stated that he has never testified as an expert witness in a legal proceeding before and was not compensated for his opinions in this case. He stated that his motivation for involvement in the matter was to conduct scientific research for publication. Counsel for Plaintiffs did, however, contribute funding to Vengosh's laboratory that was used to compensate graduate students for their work under his supervision and to pay laboratory costs for the research. (Doc. No. 228–1 (Vengosh Wr. Test.) at ¶¶ 1–6.)

196. The parties have stipulated and agreed that Vengosh is qualified as an expert by knowledge, skill,

experience, training, or education pursuant to Federal Rule of Evidence 702. (Doc. No. 221.)

197. Vengosh testified that it is his expert opinion, based on review of data regarding groundwater and surface water quality, on the analyses performed by his laboratory under his supervision, and on his knowledge and experience, that coal ash from both seeps and groundwater conduits has contaminated water at the Gallatin Fossil Plant and is discharging to surface water and into the groundwater at the site at locations other than Outfall 001. (Doc. No. 228–1 (Vengosh Wr. Test.) at ¶ 7.)

198. Vengosh testified that the presence of boron has been utilized in many studies as a reliable indicator of coal ash pollution. There are, however, other potential sources of boron. Accordingly, Vengosh explained, identifying coal ash contamination can be aided by identifying certain isotopic ratios that are in particular indicative of coal ash. (Id. at ¶¶ 11–22.)

199. Vengosh's laboratory has sampled coal ash effluents from ten coal fired power plants in North Carolina and Tennessee. All of the coal ash effluents exhibited elevated boron concentrations and similar ratios between the two naturally occurring stable isotopes of boron, B–10 and B–11. (Id. at ¶¶ 14, 24.)

200. Vengosh and co-authors have published their research on boron and strontium isotopic fingerprints of coal combustion residuals. (Id. at ¶¶ 27–28 & n.1.)

201. Under Vengosh's direction, a member of his laboratory collected surface water ***807** samples from the area around the Gallatin Plant in June of 2015. One groundwater sample was also collected from Hudson's private well. (Id. at ¶¶ 32–33.) A member of Vengosh's lab also trained Sulkin in taking groundwater samples, and Sulkin sent groundwater samples to Vengosh for analysis. (Id. at ¶ 34.) All samples were analyzed at Vengosh's laboratory, under his supervision and consistently with EPA methodology. (Id. at ¶ 35.)

202. One of Vengosh's samples, which he referred to as GT–6, was in the location of East Side 2. Based on its low strontium and boron levels, as well as its boron and strontium isotopic ratios, Vengosh concluded that this sample was unimpacted by coal ash and adopted it as a reference sample. (Id. at ¶ 43.)

203. Another sample, GT–7, was in the location of East Side 1. It also had a low boron concentration, leading Vengosh to conclude that the sample showed no evidence of contamination from coal ash. (Id. at ¶ 53.)

204. Sample GT–2 was taken on the west side of the peninsula, significantly to the north of/downstream from most of the samples taken in this case, but still to the south of/upstream from Outfall 001. Its boron concentration was also low, which Vengosh concluded showed no evidence of contamination from coal ash. (Id.)

205. Vengosh's samples GT–3 and GT–4 were close to APC 1 through 4 and the two nearby seeps included in the State Enforcement Action. These samples showed very high concentrations of boron and strontium, as well as boron isotopic ratios indicating the presence of coal ash. (Id. at ¶¶ 45–46.)

206. Vengosh's sample GT–5 was collected from a discharge in the area of the Non–Registered Site, near NRS 3 and NRS 4. It showed high concentrations of boron and strontium, as well as boron and strontium isotopic ratios indicating the presence of coal ash. (Id. at ¶ 47.)

207. In addition to the elevated concentrations of boron and strontium, GT–3, GT–4, and GT–5 had relatively high levels of other elements known to be associated with coal ash, including sulfate, calcium, manganese, and iron. GT–4 was also high in arsenic. (Id. at ¶ 48.)

208. Vengosh's analysis also found elevated levels of coal ash constituents in sampled wells. (Id. at ¶ 63.) Boron concentrations and isotopic rations indicating coal ash contamination were particularly pronounced in wells associated with the Non–Registered Site. (Id. at ¶¶ 66, 70.)

209. Vengosh's results were published in an article entitled "Evidence for Coal Ash Ponds Leaking in the Southeastern United States" in the peer-reviewed journal *Environmental Science & Technology* in 2016. (Id. at ¶ 73.)

210. Based on his results, Vengosh concluded

that water contaminated by coal ash from the Ash Pond Complex and the Non–Registered Site is discharging into the groundwater and surface water at the Gallatin Fossil Plant. (Id. at ¶ 100.)

211. Finally, at the direction of the Court, Vengosh testified about the natural variability of water sampling. He explained, "Every day, every minute of sampling would you get absolute different concentration. It's reflecting the different mixing relationship, mixing—[the] different dilution at the time of the sampling. It's not like you get always the same number. You can get different variation even the same site if you come back tomorrow ...." (Doc. No. 235 (Tr. Day 2) at 163.) The attenuation of pollutants by the river itself can also account for significant differences in concentrations: "[W]e have a huge dilution [by] the river. So because one sample had a half a percent more of ***808** river water in this blend, you would have totally different numbers, totally different values." (Id.) What is key, Vengosh explained, is to identify significant differences between a sample and the background sample. (Id.)

212. Based on its direct observation of his demeanor, candor, and responsiveness, the Court found Vengosh to be highly credible.

7. Testimony of Dr. Dennis Lemly

213. Dr. Dennis Lemly holds M.S. and Ph.D. degrees in Biology from Wake Forest University ("Wake Forest"). Until his retirement in 2016, he held dual appointments as a Research Fisheries Biologist with the United States Forest Service and as a Research Associate Professor of Biology at Wake

Forest. Lemly has amassed a number of publications tending to demonstrate significant expertise in the impacts of pollution on aquatic life. (Doc. No. 162–1 (Lemly CV) at 1–27.)

214. Lemly was retained by the Plaintiffs to review and analyze information, provide his opinion, and testify in this matter. (Doc. No. 228–2 (Lemly Wr. Test.) at ¶ 1.)

215. The parties have stipulated and agreed that Lemly is qualified as an expert by knowledge, skill, experience, training, or education pursuant to Federal Rule of Evidence 702. (Doc. No. 221.)

216. Lemly reviewed the following documents: (1) TVA's 2010–2012 Biological Monitoring Studies reports (J. Ex. 56, 57); (2) the Gallatin Fossil Plant NPDES Permit issued in 2012; (3) TVA's Discharge Monitoring Reports for the Gallatin Fossil Plant, submitted to TDEC under its NPDES permit for the years 2005 through 2015; (4) TVA's Gallatin Fossil Plant groundwater monitoring data for the year 2015, as submitted to TDEC; (5) the 2012 Groundwater Monitoring Report issued by ARCADIS (J. Ex. 55); (6) surface water, groundwater, and sediment sampling data provided by SELC (J. Ex. 8); and (7) a 2013 Environmental Integrity Project report titled "TVA's Toxic Legacy," which compiles public domain pollutant data for coal ash sites, including the Gallatin Fossil Plant. (Doc. No. 228–2 (Lemly Wr. Test.) at ¶ 6.)

217. Lemly testified that it was his expert opinion, based on review and analysis of the

available data, that selenium is being released at the Gallatin Fossil Plant to surface waters and groundwater, and that there is a high likelihood that selenium toxicity is occurring in fish and aquatic life at the Gallatin Fossil Plant. (Id. at ¶ 9.)

218. Selenium is recognized by the United States Environmental Protection Agency as a primary pollutant in coal ash. (Id. at ¶ 11 (citing Fact Sheet, Aquatic Life Ambient Water Quality Criterion for Selenium in Freshwater 2016 ("EPA Fact Sheet") (J. Ex. 58).)

219. The EPA has stated that that selenium "bioaccumulates in the aquatic food chain and chronic exposure in fish and aquatic invertebrates can cause reproductive impairments (e.g., larval deformity or mortality). Selenium can also adversely affect juvenile growth and mortality." (J. Ex. 58 (EPA Fact Sheet) at TSRA–GA076499–500.)

220. Lemly testified that the EPA has been influenced by his own research related to coal ash contamination in North Carolina. Those studies showed that concentrations of waterborne selenium less than 5 ug/L, released from coal ash, accumulates in lakes and poisons fish. Lemly explained that this bioaccumulation continued after the selenium discharges themselves had ceased. Lemly's research was published in the journal *Ecotoxicology and Environmental Safety*. He credits the research as a major factor in the EPA's 2016 decision to impose more stringent ***809** freshwater criteria for selenium. (Doc. No. 228–2 (Lemly Wr. Test.) at ¶¶ 14–15.)

221. Bioaccumulation occurs when an organism absorbs a substance at a rate faster than the rate at which the organism excretes the substance. Once consumed, dietary selenium readily accumulates in tissues, sometimes to levels several thousand times the initial waterborne concentration to which the organisms are exposed. Selenium is also passed from parent fish to their offspring in the eggs as a consequence of the contaminated diet the parent fish consume. Selenium then accumulates in the egg yolk of the fish embryo. Once eggs hatch, the selenium is absorbed into tissues, where it alters the formation of proteins, resulting in distorted and misshapen bones and other tissues. Affected embryos may die before they can hatch, or they may hatch alive but with identifiable deformities. (Id. at ¶¶ 21–26.)

222. Lemly presented photographic examples of fish with skeletal deformities typical of selenium toxicity. Those examples, however, did not come from any waters affected by the Gallatin Plant. (Id. at ¶¶ 28–35.) On cross examination, he confirmed that he had not identified any deformed fish at Old Hickory Lake. (Doc. No. 235 (Tr. Day 2) at 201.)

223. The examples Lemly provided did, however, provide general background about the potential risks associated with coal ash contamination in certain levels. For example, Lemly discussed coal ash contamination from unlined pits in North Carolina's Belews Lake. He produced photographs of fish from Belews Lake with significant skeletal deformities apparent to the naked eye. According to Lemly, the selenium toxicity at Belews Lake caused the total

elimination from the lake of nineteen species of fish. Only three species remained. (Doc. No. 228–2 (Lemly Wr. Test.) at ¶¶ 30–34.)

224. Lemly explained that a large-scale dying off of fish due to selenium toxicity often manifests subtly at first, because the deaths of unhatched embryos or newly hatched fish goes unnoticed. Accordingly, a fish population may be suffering significantly from selenium exposure without there ever being a large-scale, easily noticed fish kill event, such as the appearance of large numbers of dead fish on the surface of the water. (Id. at ¶ 38.)

225. Lemly testified that it is difficult to draw inferences about fish population levels in the Old Hickory Lake area, because it is an open aquatic system—meaning that fish pass freely into, through, and out of it—as well as due to the effect of state and/or federal fish stocking programs intended to augment the population of sport fish. (Id. at ¶¶ 41–45.)

226. Lemly identified Old Hickory Lake as a "lentic" system, meaning a water habitat with slow-moving or standing water. In contrast, a "lotic" system is a system with more rapidly flowing water. Bioaccumulation of selenium is facilitated by lentic systems. For this reason, the EPA has imposed a more stringent selenium criterion for lentic systems than for lotic systems (Id. at ¶¶ 55–59.)

227. Lemly described an appropriate methodology for determining the impact of selenium on fish in Old Hickory Lake based on detailed studies

of newly hatched fish. It does not appear, however, based on Lemly's testimony, that such an investigation had been performed at the time of his analysis. (Id. at ¶ 48.)

228. Lemly has, however, developed a hazard rating model for the evaluation of the aquatic hazard posed by selenium. That model has been published in peer-reviewed scientific literature. (Id. at ¶ 60.) As relevant to this case, Lemly evaluated the aquatic ecological hazard of selenium being discharged at the Gallatin Fossil ***810** Plant by comparing the concentrations of selenium measured in site sampling data with toxic threshold values and biological effects criteria for fish and other aquatic life and aquatic-dependent wildlife. (Id. at ¶ 62.) Because the EPA and the states have not established biological effects criteria for wildlife, Lemly relied on peer-reviewed scientific literature for wildlife toxicity data. (Id. at ¶ 65.)

229. On cross examination, TVA pressed Lemly on whether his analysis in this case truly conformed to the peer-reviewed methodology that he had previously developed. In particular, Lemly admitted that his protocol called for data not only from water and sediment but also certain organisms and both fish and bird eggs. While the model may still be used if only one of those three additional data sources is missing, a lack of two or more contemplated data sources means that the analysis, under Lemly's published model, is not complete. The analysis in this case relies only on surface water, groundwater, and sediment sampling, which does not comply with Lemly's published model. (Doc. No. 235 (Tr. Day 2) at

194–95.) On re-direct, Lemly explained that, although the published model does call for reliance on several factors, each factor does have its own hazard rating scale, and thus the factors are capable of being applied independently. (Id. at 217.)

230. Lemly's model characterizes the degree of hazard for a particular area as Low, Moderate, or High. These hazard ratings reflect Lemly's assessment of the expected effects of acute and chronic waterborne exposure and acute and chronic dietary exposure to contaminants. A "Low Hazard" rating reflects contaminant concentrations that at least equal or exceed one-fourth of the chronically toxic concentration. A "Moderate Hazard" rating reflects concentrations that at least equal or exceed one half of the chronically toxic concentration. A "High Hazard" rating reflects concentrations that at least equal or exceed acutely or chronically toxic levels. (Doc. No. 228–2 (Lemly Wr. Test.) at ¶¶ 66–68.)

231. Lemly's analysis designated selenium as High Hazard in the area of the Gallatin Plant—meaning that he considered the selenium concentration to equal or exceed acutely or chronically toxic levels. He testified that this concentration of selenium would be expected to cause toxicity in a wide range of animals at all levels of the area's ecosystem, including fish such as minnows, darters, sunfish, and bass; amphibians including toads, frogs, and salamanders; crustaceans such as amphipods and crayfish; mollusks such as mussels, clams, and snails; and insects and worms. (Id. at ¶¶ 85–86.)

232. Specifically, Lemly concluded that selenium is present in the surface water discharges from the Gallatin Fossil Plant at up to 75 parts per billion, 50 times what he identified as the threshold value for bioaccumulation to toxic levels in the tissues of aquatic life. (Id. at ¶ 84.)

233. He similarly designated selenium as High Hazard in the area's groundwater, concluding that the groundwater concentrations exceed up to 45 times the threshold for bioaccumulation in fish and aquatic life. (Id. at ¶¶ 90–92.)

234. In Lemly's expert opinion, the polluted groundwater at the Gallatin Fossil Plant poses a grave threat to aquatic life when it reaches the surface. (Id. at ¶ 93.)

235. Finally, Lemly's analysis also gave a High Hazard designation to selenium in the sediment samples. Selenium is present in sediment at the Gallatin Fossil Plant at concentrations up to 130 parts per million, 65 times higher than the threshold concentration for toxic bioaccumulation in aquatic life. (Id. at ¶¶ 96–97.) Sediment, Lemly ***811** explained, is a significant route by which fish and aquatic life are exposed to coal ash pollutants, in particular for sediment-dwelling creatures such as catfish, frogs, and crayfish. (Id. at ¶ 98.)

236. On cross examination, Lemly confirmed that, in reaching his conclusions, he relied on the highest available concentration readings, not average or median concentration levels based on all of the

available sampling. (Doc. No. 235 (Tr. Day 2) at 198.)

237. Lemly also conceded that the toxic concentration values he identified and relied upon were more stringent than Tennessee's water quality criteria. (Id. at 199–200.)

238. Based on its direct observation of his demeanor, candor, and responsiveness, the Court found Lemly to possess some general credibility on the foundational question of whether selenium presents risks of bioaccumulation and toxicity in fish and aquatic life, although the Court does note that Lemly appears to take an aggressive view of when that risk becomes significant. Although the Court did find Lemly's hazard analysis relevant to this case, the Court found that the reliability of his conclusions was undermined significantly by the lack of corroborating data from fish tissues or eggs, as well as the lack of evidence from the morphology of any fish or aquatic life taken from the Old Hickory Lake area.

8. Testimony of Britton Dotson

239. Dotson is an environmental fellow at TDEC's Division of Water Resources. He described his responsibilities as varied, but generally drawing on his experience and knowledge related to geology and/or waste management. Dotson has a bachelor's degree in Geology and a master's in Geography from WKU. (Doc. No. 236 (Tr. Day 3) at 4–5.) He testified that his education included an emphasis in karst, in particular in WKU's graduate program, where Dotson worked with Dr. Nicholas Crawford at the Center for Cave and Karst Studies. (Id. at 6.)

240. In the six months preceding the trial, the majority of Dotson's work for TDEC involved TVA, with the bulk of it consisting of work related to the Gallatin Plant. He estimated that he had visited the Plant twenty to thirty times. (Id. at 6.)

241. When asked if he had "seen karst features at the Ash Pond Complex," Dotson replied, "I've seen karst features in that part of the facility." (Id. at 7.)

242. Dotson testified that he had seen karst features both to the north of the Ash Pond Complex and to the south of the Ash Pond Complex. (Id.) When asked if these features included sinkholes, fissures, vertical joints, or caves, he replied, "All of the above." (Id. at 8.)

243. When asked if he had seen karst features within the Ash Pond Complex, he responded:

> I have seen indications of solutionally developed bedrock in the western portion of Pond E. So—that's not to say that I've seen open features or that sort of thing, but—but rock that develops in that form is typical of a karst process. So I have observed that within the—within Pond E.

(Id.) He testified that it would be difficult to directly observe karst features within the Ash Pond Complex because it is covered with ash. (Id. at 11.)

244. Dotson testified that in November of 2016,

he was at the Gallatin Plant and observed a geologic feature that concerned him in an exposed area of Pond E. Dotson described what he observed as a "scarp"—a type of feature formed by an abrupt change or drop in materials. (Id. at 15–17.) He characterized the feature as "indicative of what I would expect if there's been a ***812** collapse of material." (Id. at 16.) Dotson testified that it is common, in karst areas, for a void to develop underneath surface material, and for that material then to collapse into the void, leaving a "telltale scarp." (Id. at 17.)

245. When asked if, to his knowledge, karst features had developed in the Ash Pond Complex in the past, Dotson replied that they had. When asked if those features had been repaired, he replied, "Some of them." (Id. at 19.)

246. Dotson testified that he had been informed by TVA that some recent groundwater testing had found arsenic levels that exceeded EPA maximum contaminant levels ("MCLs") in multiple wells. (Id. at 23–24.)

247. Dotson also testified about recent well water data he had reviewed. He testified that the water levels in the wells showed a "very immediate response" to changes in the Cumberland River suggestive of a direct hydrological connection such as a conduit, rather than merely through porous material.[5] (Id. at 29–30.)

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[5] Although TVA objected to some questions posed by Plaintiffs to Dotson on the ground that they improperly called for expert opinion or speculation, or were based on information that the

248. On cross examination, Dotson conceded that he does not know whether or not Pond E is losing any water, from the potential karst feature he identified or otherwise. (Id. at 33.)

249. Based on its direct observation of his demeanor, candor, and responsiveness, the Court found Dotson to be generally credible.

C. TVA's Evidence at Trial

1. Testimony of Gabriel Lang

250. Gabriel Lang is a program manager and senior engineer with TVA contractor AECOM. He has a Bachelor of Science degree from the University of South Florida, with a major in civil and geotechnical engineering, and has performed graduate studies in geotechnical engineering at the University of Pittsburgh. He is a licensed civil engineer in a number of states, including Tennessee. Lang has substantial professional experience with projects involving coal combustion residual impoundments and landfills. Among the issues Lang has experience addressing is karst mitigation. (Doc. No. 229–1 (Lang Wr. Test.) at 1–2.)

251. Lang currently serves as the program manager of the coal combustion product

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Court had previously excluded, TVA lodged no objection to this portion of Dotson's testimony. Nevertheless, the Court will consider the fact that Dotson was not qualified as a Rule 702 expert when determining the amount of weight to give to his testimony.

management program for TVA. Lang's job responsibilities include oversight of a team of civil and geotechnical engineers providing engineering services related to CCR storage, closure, and management. He has been working at the Gallatin Plant since 2009, and his job duties at Gallatin have included serving as a lead engineer, project manager, and engineer of record for projects including CCR operations, stability improvements, dry storage, and impoundment closure evaluations. (Id. at 1.)

252. In connection with this case, Lang was asked by TVA to provide his professional evaluations as a civil/geotechnical engineer regarding the CCR management and treatment facilities at Gallatin and to evaluate Plaintiffs' Experts' reports and allegations. (Id. at 3.) Lang relied on his personal observations and experience, as well as TVA, AECOM, and U.S. Army Corps of Engineers records. (Id. at 4.)

253. The parties have stipulated and agreed that Lang is qualified as an expert by knowledge, skill, experience, training, ***813** or education pursuant to Federal Rule of Evidence 702. (Doc. No. 221.)

254. Lang testified that, according to the records he reviewed, TVA reported erosion of minor amounts of ash from one spillway associated with the ponds in the area now known as the Non–Registered Site. In 1975, TVA closed the spillway, sealed it with concrete and covered the area in vegetation to prevent further erosion. (Doc. No. 229–1 (Lang Wr. Test.) at 5.)

255. Photographs taken in connection with the 1978 inspection of the Non–Registered Site documented continued erosion of the perimeter dikes adjacent to the Cumberland River, and references to potential erosion continue to appear in records into at least the early 1980s. (Id. at 6.)

256. Lang testified that it is his expert opinion, based upon the available historical information, that the presence of localized ash in the river near the NRS spillway is related to that historical erosion and is not related to TVA's current operations at Gallatin. (Id. at 5.)

257. However, according to the documents on which Lang relied, the Non–Registered Site simultaneously experienced both erosion and percolation of water into groundwater. He quoted a 1981 inspection as follows:

> These areas are abandoned. The only water into these areas is rainfall. There is no discharge from these areas. All rainfall is evaporated **or percolates into the groundwater**.
>
> The steep outside slopes have no vegetation. Erosion of these slopes is being controlled by the construction of a ridge along the outside edge of the top of the dike and sloping the top of the dike to the inside.

(Id. at 6 (quoting J. Ex. 176 at 2) (emphasis added).) Lang's discussion of efforts to remediate the erosion problem did not suggest that they would have also eliminated the percolation of rainfall through the

Non–Registered Site and into the groundwater. (Doc. No. 229–1 (Lang Wr. Test.) at 4–5.)

258. Lang testified that TVA's implementation of the 1997 Non–Registered Site closure plan included improving drainage and regrading portions of the site to prevent ponding and "excess infiltration" from surface runoff. (Id. at 7.) He conceded in his direct testimony, however, that, under current engineering standards, the 1997 closure plan would not be considered sufficient to reduce surface water infiltration of the Non–Registered Site. (Id.)

259. He also conceded that there are saturated conditions within the subsurface of the Non–Registered Site as a result of groundwater and surface water infiltration/percolation, and that, under these conditions, it is possible for seepage to occur from the Non–Registered Site. Any earthen dam structure would be expected to experience some seepage, he explained. (Id. at 8.)

260. He also explained that seepage from the Non–Registered Site fluctuates seasonally, primarily due to the varied intensity of rainfall events. (Id.)

261. AECOM, Lang testified, has identified a total of twenty-two seep locations at Gallatin, including nine which are on or adjacent to the embankments of the Non–Registered Site. (Id. (citing J. Ex. 157 at 13–21).) Lang characterized those nine seeps as what AECOM refers to as "Level 1" seeps, meaning that they do not represent an imminent danger to the embankment in terms of erosion but may require additional monitoring. (Id. at 8–9.) None

of the seeps, however, are currently flowing, according to Lang. (Id. at 9.)

262. Lang also testified that there is no record of coal ash flowing through an embankment seep directly into the Cumberland River. (Id.)

***814** 263. Lang discussed a September 2011 assessment of the structural stability of the dams at the Ash Pond Complex, performed by EPA contractors at Dewberry Consultants LLC ("Dewberry"). The assessment, presented in final form in 2013, rated Pond E as "SATISFACTORY" and Ponds A, B, C, and D as "FAIR," meaning that they would not be considered satisfactory unless certain remedial measures were taken. (Id. at 9–10 (quoting J. Ex. 126 at 1–3).)

264. The Dam Assessment Report also noted that "seepage areas are minor and are adequately monitored." (J. Ex. 126 at 7–11.)

265. Lang testified that the EPA issued a "Request for Action Plan" regarding the recommendations in the 2013 report, and that TVA has since formulated and completed such a plan. (Doc. No. 229–1 (Lang Wr. Test.) at 11.)

266. Lang testified that TVA's NPDES Permit for the Gallatin Plant required it to submit a closure plan for the Ash Pond Complex. (Id. (citing J. Ex. 102, Ex. 6 at 23).) TVA submitted the required closure plan on September 25, 2012. (Id. (citing J. Ex. 151).) Lang served as the engineer in charge of the Preliminary Ash Pond Closure Plan. (Id.)

267. The Preliminary Ash Pond Closure Plan calls for "closure in place" of Ponds A and E, meaning that they would be closed without the underlying coal ash waste being removed and relocated. Ponds B, C, and D would remain in operation for the management of storm water runoff from upstream drainage areas. (Id. at 12.)

268. Closure in place is one of two options for the closure of surface coal ash impoundments potentially available under the EPA's Rule for Disposal of Coal Combustion Residuals from Electric Utilities ("CCR Rule"). See 80 Fed. Reg. 21,302 (Apr. 17, 2015). The other is "closure by removal," which, as its name suggests, involves removal of waste and decontamination of the area. (Doc. No. 229–1 (Lang Wr. Test.) at 12.)

269. According to Lang, the Gallatin Plant's Closure Plan estimates that closure of Pond E will be completed in 2021 and closure of Pond A will be completed in 2025. Each closure will be followed by a thirty-year Post–Closure Period during which the Plan calls for certain regular monitoring and maintenance. (Id. at 14–15.)

270. In contrast, Lang estimated that closure by removal, with the excavated coal ash being moved to an on-site landfill, would take twenty-four or more years before closure would be completed. (Id. at 23.) Closure by removal would also, according to Land, require a thirty-year post-closure monitoring period. (Doc. No. 236 (Tr. Day 3) at 146.)

271. On re-direct, Lang elaborated about the potential sites to which excavated coal ash could be moved. He said that the use of the on-site landfill had been considered, but that it presented some challenges. He testified that a landfill in or near Murfreesboro had also been considered, but that it was "a distance away." He described the truck traffic necessary to use an offsite landfill as substantial, specifically offering the figure of fifty to one hundred trucks on the road a day for a period of twenty years. (Id. at 134.)

272. Lang testified that closure in place was selected because it presented the most feasible means of expediting the closure of the ash ponds. (Doc. No. 229–1 (Lang Wr. Test.) at 15.) He noted in particular that the significant amounts of deeply buried ash in the Ash Pond Complex would present safety and environmental challenges for closure by removal. (Id. at 15.) In particular, Lang testified that excavation of coal ash would create increased potential for the formation of new sinkholes ***815** during the excavation process. (Id. at 25.) The need to bring in outside soil would also give rise to the ordinary environmental and safety risks associated with increased truck traffic, such as increased greenhouse gas emissions and risk of traffic accidents. (Id. at 24.)

273. Lang testified that closure by removal was not, in his opinion, feasible, in light of the size and conditions of the Ash Pond Complex. Lang cited both the risk of increased karst activity during the excavation process as well as the lengthy period of time that he estimated would be required for closure

to be completed. He testified that AECOM was not aware of any completed ash pond removal projects of the magnitude that would be required for the Gallatin Plant, with the exception of the efforts required after the massive 2008 coal ash spill near Kingston, Tennessee. (Id. at 26–27.) On cross examination, however, he conceded that as many as 70% of the individual surface impoundments in South Carolina were being closed by removal. (Doc. No. 236 (Tr. Day 3) at 109.)

274. Lang echoed EPA guidance that the choice between closure in place and closure by removal must be made on a case-by-case basis. He testified that it was his opinion, within a reasonable degree of scientific certainty, that closure in place via *inter alia* placement of a geosynthetic cap would, in this instance, meet the minimum requirements of the CCR Rule. (Doc. No. 229–1 (Lang Wr. Test.) at 18–19.)

275. Lang testified that AECOM had developed a conceptual plan for further closure of the Non–Registered Site, intended to remedy deficiencies in the Site's prior capping and closure. The centerpiece of that plan is the placement of a geosynthetic cap that, Lang estimated, would reduce surface water infiltration by 99.8%. (Id. at 30–31.)

276. On cross examination, Lang conceded that recent sampling of wells in the area of the Gallatin Plant showed some exceedances of MCLs for arsenic. (Doc. No. 236 (Tr. Day 3) at 110–11.) He also conceded that there was a history of sinkholes in the Ash Pond Complex. (Id. at 113.)

277. Lang admitted that the assumptions underlying his analysis of closure in place of the Ash Pond Complex assumed water infiltration only through direct vertical infiltration of rain from directly above the closed ponds or via runoff of stormwater from immediately adjacent areas. He did not, in other words, contemplate the potential for lateral infiltration of water via groundwater flowing from farther away coming into contact with coal ash because the ash itself was in contact with or below the water table. (Id. at 118–19.)

278. Lang conceded, on cross examination, that a March 2015 document created by AECOM, on which he had worked, including the following statements regarding Ash Pond E: "A portion of the ash is below (up to 10 feet below) the elevation of the Cumberland River"; and "If the Pond is hydraulically connected to the Cumberland River, dewatering below river level would be virtually impossible (you cannot pump the river down)[.]" The latter of these two statements was identified as a "Potential Fatal Flaw" to the dewatering process. (Id. at 128-29; J. Ex. 113 at 7.)

279. Lang stressed, however, that, based on subsequent investigation from wells on the Gallatin Plant site, there was no evidence of a hydrologic connection between the Pond and the Cumberland River. (Doc. No. 236 (Tr. Day 3) at 130.)

280. On re-direct, Lang discussed the potential scarp feature that Dotson had observed. He stated that the feature appeared to him to be an "erosional feature" rather than a sinkhole. (Id. at 135.) He

testified that the feature was being monitored photographically and that some photographs ***816** depicted standing water atop the feature. (Id. at 136–39.)

281. Based on its direct observation of his demeanor, candor, and responsiveness, the Court found Lang to be generally credible, with the caveat that it has considered his testimony in light of his close professional relationship with TVA and his past responsibility for TVA's development of closure strategies for the ash ponds.

2. Testimony of Dr. Neil Carriker

282. Dr. Neil Carriker has a B.S. degree in Chemistry from the University of North Carolina–Charlotte and M.S. and Ph.D. degrees in Environmental Engineering from the University of Florida. He performed post-doctoral research at the University of Minnesota. He currently works as a contractor for TVA in matters related to environmental investigations at the Gallatin Plant. (Doc. No. 158–6 (Carriker Wr. Test.) at 2; J. Ex. 273 (Carriker CV).)

283. Carriker worked directly for TVA from 1979 to his retirement in 2009, holding various positions related to water quality and management. He currently holds the title of Program Manager in Environment and Technology Special Projects for the Gallatin Plant. Carriker has primary responsibility for coordinating TVA's preparation of the EIP arising out of the State Enforcement Action. Prior to his work in this matter, Carriker developed and managed TVA's environmental investigations of the

Kingston coal ash spill. He has authored or reviewed a number of peer-reviewed papers related to the Kingston investigations, and has served as an associate editor of the journal of the North American Lake Management Society. His professional experience is broadly indicative of significant expertise in the area of water resource management, with a particular perspective related to TVA's operations. (Doc. No. 158–6 (Carriker Wr. Test.) at 2; J. Ex. 273 (Carriker CV).)

284. In connection with this case, Carriker was asked by TVA to provide testimony about the process and results of environmental compliance activities at the Gallatin Plant, including issues related to sampling procedures, standards, and results. Carriker relied on his own observations, TVA records, various expert reports, a summary of invertebrate sampling from 2014 and 2015, and information obtained in the development of the EIP. (Doc. No. 158–6 (Carriker Wr. Test.) at 4–5.)

285. The parties have stipulated and agreed that Carriker is qualified as an expert by knowledge, skill, experience, training, or education pursuant to Federal Rule of Evidence 702. (Doc. No. 221.)

286. Carriker testified that he believed that, at the time of trial, there was insufficient information available concerning the current hydrology and geology at the Gallatin Plant to form an accurate understanding of current conditions. He stated that the EIP—which still required substantial work to be performed—was intended to create the basis for forming a more accurate, contemporary picture of the

conditions of the site. (Doc. No. 158–6 (Carriker Wr. Test.) at 6.)

287. Carriker contrasted TVA's ongoing data collection sampling with the data collection and sampling relied upon by Plaintiffs. He took fault with what he characterized as Sulkin's failure to adequately document the procedures surrounding his collection of samples and his reliance instead on a general claim to have followed "standard state and EPA protocol." (Id. at 9–10.)

288. Carriker also opined that Sulkin had inadequately documented his analysis of the cenospheres he observed in a sediment sample. (Id. at 10.)

289. Carriker went on to disagree with Vengosh's analysis and conclusions, in particular ***817** his reliance on elevated salinity levels as supportive of identifying improper discharges. Carriker testified that elevated conductivity due to increased salinity is common for waters in close contact with soil. Carriker also opined that, even if Vengosh's analysis is correct with regard to identifying discharges, his data do not establish any effect on the adjacent surface waters. (Id. at 13.)

290. Carriker also criticized Vengosh's reliance on manganese as an indicator of contamination, on the ground that manganese is plentiful in the earth's crust itself. (Id.)

291. Carriker next took issue with the wide variances in the Plaintiffs' experts' measurements of

certain chemicals that provide stronger indications of contamination, such as arsenic, boron, and strontium. These variances, Carriker explained, make it difficult to draw definitive conclusions about the sources of the contaminants or their potential to adversely affect the waters. (Id.)

292. Carriker faulted Lemly's analysis for ignoring important variables and improperly relying on maximum measured contaminant values to the exclusion of lower measurements. (Id. at 14–15.)

293. Carriker also discussed fish tissue testing performed at Plaintiffs' behest after Lemly's analysis, which Carriker characterized as showing selenium toxicities well below EPA criteria. (Id. at 18.)

294. On cross examination, Carriker conceded that there is coal ash in the Cumberland River in the area surrounding the Gallatin Plant, as shown by TVA's own testing. (Doc. No. 236 (Tr. Day 3) at 166.)

295. Based on its direct observation of his demeanor, candor, and responsiveness, the Court found Carriker to be generally credible, albeit with the caveat that his longstanding professional association with TVA could be reasonably likely to predispose him to positions favorable to its actions and positions. The Court found many of Carriker's critiques of Plaintiffs' analyses persuasive, but also notes that Plaintiffs' experts, in particular Sulkin and Vengosh, had already qualified their conclusions in ways that lessen the impact of many of Carriker's complaints. In particular, while it is clear that

Plaintiffs have not presented evidence adequate to fully and accurately assess the extent or impacts of any unauthorized discharges, its experts in many respects preemptively conceded as much, focusing instead on the binary question of verifying the existence or nonexistence of those discharges. Carriker's testimony was less persuasive in undermining that aspect of Vengosh, Quarles, and Sulkin's analyses.

3. Testimony of Dr. Walter G. Kutschke

296. Dr. Walter G. Kutschke is a senior geotechnical engineer and geotechnical department manager with AECOM, where he has been employed for over twenty-two years. He has a B.S. degree in Civil Engineering and M.S. degree in Geotechnical Engineering from the State University of New York at Buffalo, as well as a Ph.D. in Geotechnical Engineering from the University of Pittsburgh. He is a licensed civil engineer in several states, including Tennessee. (Doc. No. 229–2 (Kutschke Wr. Test.) at 1–2; J. Ex. 196 (Kutschke CV).)

297. Kutschke has published twenty-one peer-reviewed papers involving geotechnical engineering projects as well as geotechnical research projects. He is a member of the American Society of Civil Engineers ("ASCE"), the Geo–Institute, and a committee member in the ASCE Grouting Committee and ASCE Earth Retaining Structures Committee, as well as a member of the Society of Military Engineers. Kutschke also served as an elected officer (three terms) in the ASCE ***818** Earth Retaining Structures Committee. Kutschke's experience establishes substantial expertise in the

area of geotechnical engineering. (Doc. No. 229–2 (Kutschke Wr. Test.) at 2–3.)

298. Kutschke has been involved with work at the Gallatin Plant since 2011. His duties have included assisting with TVA's work pursuant to the EIP and responding to Plaintiffs' allegations related to karst at the Ash Pond Complex in this litigation. Kutschke has been onsite at Gallatin more than twenty times, and he currently serves as the lead karst engineer for TVA's ongoing work at the Gallatin Plant. (Id. at 2.)

299. Kutschke's opinions are based on his personal observations, experience, and knowledge, as well as data and TVA, AECOM, and Army Corps of Engineers records made available for his review. (Id. at 3–4.)

300. The parties have stipulated and agreed that Kutschke is qualified as an expert by knowledge, skill, experience, training, or education pursuant to Federal Rule of Evidence 702. (Doc. No. 221.)

301. Kutschke testified that, according to TVA records, TVA conducted a transit and tape survey of Odom's Bend peninsula in 1952, which TVA used to prepare a Land Acquisition Map for the Gallatin facility. That map, Kutschke testified, does not show an intermittent drainage feature identified as Sinking Creek. (Doc. No. 229–2 (Kutschke Wr. Test.) at 5 (citing J. Ex. 68; J. Ex. 211; J. Ex. 212).)

302. Kutschke discussed TVA records' documentation of the 1977 repairs to sinkholes in the

floor of the Ash Pond Complex. He testified that the records show that the repairs succeeded in sealing the particular sinkholes identified and allowing the ash sluice water to leave the pond through the spillways, as designed. (Id. at 7.) He testified that, to his knowledge, and based upon his review of TVA records, the sinkholes that were leaking in the 1970s were all repaired by TVA. (Id. at 8.)

303. Kutschke testified that his review of more recent records showed that there were no known additional sinkholes in the Ash Pond Complex. (Id. at 8–9.) Kutschke admitted that, in 2005, TVA found and repaired suspected sinkholes during the expansion of Ash Pond E, but that these repairs were made while the Pond was out of service for expansion. He also admitted that, in May 2010, following flooding, TVA identified four sinkholes on the Gallatin Plant property: one to the north of Pond C and three additional sinkholes that were not in the immediate pond area. (Id. at 9.) He testified that no unlawful discharges would have been made through the sinkholes discovered in 2005 or 2010 because the 2005 sinkhole was found early during construction and the 2010 sinkholes were found outside the Ash Pond Complex itself. (Id.)

304. Kutschke's description of karst terrain generally confirmed Plaintiffs' experts' descriptions. He testified that the Ash Pond Complex is situated primarily over Carters Limestone (with some Lebanon Limestone), and that published geologic mapping suggests that, at the Ash Pond Complex, karst activity is generally associated with the Carters Limestone. (Id. at 10.)

305. Kutschke also echoed the conclusion that passage of water through karst tends to occur through voids and fractures, rather than solely through slow seepage through porous matter. As he explained it, groundwater drains downward and pools along the limestone surface, at which point lateral water flow typically will reach a fracture, bedding, or joint feature, which allows the continued migration of water downward. (Id. at 11.)

306. Karst, as he explained it, is characterized by water flow through large voids, ***819** including enlarged fissures and tubular tunnels. He explained that sinkholes occur in karst settings where geologic conditions have created solution pathways in the underlying soluble rock where water can cause subsurface erosion of the overlying sediment. (Id.)

307. Kutschke testified that 2015 borings in the area of the Ash Pond Complex did not encounter cavernous features that would suggest a "high relative risk" of roof collapse and immediate sinkhole development. (Id.)

308. He further testified that borings in the alleged Sinking Creek area did not encounter subsurface conditions indicative of a sinking creek. (Id. at 11–12.)

309. Kutschke testified that relevant hydrograph data—that is to say, data tracking water level and flow rates—did not indicate rapid conductivity suggestive of emptying of water through karst features. (Id. at 13.) The hydrograph data, he

explained, suggested a relatively low risk of sinkhole development because, without sufficient water flow through the karst features, there would not be significant progressive erosion giving rise to new sinkholes. (Id. at 13.)

310. Kutschke also testified that the volume of water discharging from Outfall 001 and the water level in Pond D suggest that the Complex is operating as designed, supporting an inference that it is not losing water through karst features. (Id.) On cross examination, however, he conceded that water could reach and discharge through the outfall even in the presence of leaks. (Doc. No. 237 (Tr. Day 4) at 12.)

311. In summary, Kutschke testified to his opinion that the available boring log and hydrograph data, as well as his personal observations, suggest minimal, if any, subsurface water loss. Any such loss, he opined, is likely diffuse, rather than through a direct karst connection between the Ash Pond Complex and the Cumberland River. (Doc. No. 229–2 (Kutschke Wr. Test.) at 14.)

312. Finally, Kutschke testified that, in his opinion, the karst terrain under and around the Ash Pond Complex would not preclude closure in place from being an appropriate method of closure. (Id. at 14–15.)

313. On cross examination, Kutschke admitted that TVA reports from 1972 through 1976 purported to find no evidence of loss of ash from the Ash Pond Complex, despite the fact that the ponds were

eventually discovered to be releasing what would eventually amount to twenty-seven billion gallons of sluice water. (Doc. No. 237 (Tr. Day 4) at 10.)

314. On cross examination, he was also pressed in greater detail on AECOM's 2015 boring logs. Plaintiffs successfully demonstrated that boring logs did, in fact, show evidence of significant fractures, apparent voids, and water-bearing features in the Gallatin Plant's karst terrain. (Id. at 24–26.) The specific examples raised by Plaintiffs, however, were not immediately within the boundaries of the Ash Pond Complex. (Id. at 28–29.)

315. Based on its direct observation of his demeanor, candor, and responsiveness, the Court found Kutschke to possess some credibility, with the caveat that AECOM's relationship to TVA could be reasonably likely to predispose him to interpretations favorable to TVA's practices and interests. The Court also notes that, on cross examination, Kutschke repeatedly failed to give yes-or-no answers to yes-or-no questions, in particular with regard to whether there are continuing unrepaired karst features in the Ash Pond Complex. For example, counsel for Plaintiffs asked, "So there are a dozen unrepaired karst features in Ash Pond A, correct?" Rather than simply replying "Yes," "No," or "I don't know," Kutschke responded, "Again, that's not a ***820** yes-or-no answer. Just because—TVA has documentation that they repaired leaking sinkholes. The leaking sinkholes were repaired. Just because it's a karst feature doesn't necessarily have to have a repair done to it if it's not a leaking feature." (Id. at 17.) Plaintiffs also effectively impeached Kutschke

based on apparently inconsistent prior deposition testimony with regard to whether such unrepaired features were capable of conduit flow. (Id. at 20.) The Court considered Kutschke's evasive answers and impeachment relevant to, but not wholly undermining of, his credibility.

4. Testimony of Elizabeth Perry

316. Elizabeth Perry is a Senior Hydrogeologist at AECOM, where she has worked for seventeen years. She has a B.A. degree in Mathematics and Geology from Hamilton College and an M.S. degree in Engineering Geology from Drexel University. She is a professionally licensed geologist in Tennessee and two other states and a member of the National Groundwater Association and the International Association of Hydrogeologists. Perry has more than thirty years of experience practicing geology and hydrogeology, and she has authored or co-authored several publications and presentations on related subjects. Her credentials demonstrate substantial expertise in hydrogeology. (Doc. No. 230–1 (Perry Wr. Test.) at 1–2; J. Ex. 230 (Perry CV).)

317. Perry has been working for AECOM at the Gallatin Plant since 2014. Her job duties have included: supervising matters related to the Plant's groundwater monitoring network; reviewing historical and regional studies and information related to groundwater at and in the vicinity of the Gallatin Plant; developing and reviewing work plans related to various geologic, hydrogeological, and environmental chemistry investigations; interpreting and supervising the interpretation of data and results from various investigations on site with

respect to groundwater; providing expert witness support related to groundwater; and communicating status, progress, information, and findings to TVA and to TDEC. (Doc. No. 230–1 (Perry Wr. Test.) at 2.)

318. In connection with this case, Perry was asked by TVA to render her professional opinion regarding the groundwater system at Gallatin with a specific focus on the groundwater system beneath the Ash Pond Complex and the Non–Registered Site. Her opinions were based on personal experience, review of data, and review of TVA, AECOM, TDEC, and U.S. Geological Survey records. (Id. at 3–4.)

319. The parties have stipulated and agreed that Perry is qualified as an expert by knowledge, skill, experience, training, or education pursuant to Federal Rule of Evidence 702. (Doc. No. 221.)

320. Perry took issue with some of the assumptions underlying Quarles' earlier testimony regarding water levels in wells in the vicinity of the Ash Pond Complex. In particular, she focused on the inferences that could be drawn from those water levels. Perry explained that groundwater in confined aquifers is under pressure—known as the "hydraulic head." A well that penetrates an aquifer with a high hydraulic head will see the well water rise, due to hydraulic head, to a level that may not accurately reflect the level of the water in the aquifer itself. If an aquifer is not tightly confined, however, there will not be pressure increasing the height of water in the well, and the well presumably will give a more accurate picture of the actual groundwater level. (Id. at 5–6.)

321. Perry testified that only one portion of the Gallatin Plant site, the vicinity of the North Rail Loop ("NRL") Landfill, had been subject to an extensive study of its hydrogeology. That study found that fractures ***821** in the Lebanon limestone formed a confined aquifer with a significant hydraulic head. (Id. at 10–11.) The study of the NRL Landfill area did not identify any karst features, such as sinkholes, within the landfill limits. (Id. at 11) Perry testified that 2015 drilling suggested that the bedrock features of the NRL Landfill area extended to areas along the south and east of the ash ponds. (Id. at 11–12.)

322. Perry admitted that bedrock is visible at the ground surface in much of the area surrounding the Ash Pond Complex, which suggests that there may not be significant alluvial deposits overlying the bedrock. (Id. at 12.)

323. According to Perry, most of the groundwater flow in the area of the Ash Pond Complex is expected to take place through the underlying bedrock. (Id.)

324. Perry further conceded that 2015 drilling in the vicinity of the Ash Pond Complex discovered water-bearing zones in both shallow and deeper depths of the limestone. They did not, however, encounter what Perry characterized as open, cavernous conditions indicative of potential conduit flow. (Id. at 13.)

325. Perry testified that, according to the hydrograph data, some of the groundwater wells in

the vicinity of the Ash Pond Complex exhibit groundwater fluctuations that are highly correlated with Cumberland River water levels, while the water levels in other wells are independent. This would suggest that some but not all of the wells are hydrologically connected to the river. (Id. at 15.)

326. Water levels in the Ash Pond Complex, however, appeared to be independent of changes in the groundwater level, which Perry characterized as strong evidence of a lack of connection between the Complex and the underlying groundwater. (Id.)

327. Based on the water levels, Perry testified that her opinion, based on available information and to a reasonable degree of scientific certainty, was that there are no open conduits providing direct connection between the water in the Ash Pond Complex and the Cumberland River. (Id. at 16.)

328. Perry next discussed the Non–Registered Site. She testified that the alluvium beneath the Non–Registered Site is a porous medium allowing groundwater to percolate slowly through the tiny pore spaces between grains of sand and clay. Water in the Non–Registered Site, she explained, exits by percolating slowly vertically downward into the underlying alluvium. Groundwater in the alluvium and bedrock beneath the Non–Registered Site is diffuse and percolating as it migrates toward and discharges into the Cumberland River. (Id. at 16–17.) When asked whether groundwater passed laterally through the Non–Registered Site, she testified that it might, but that TVA was still in the process of examining the question. (Doc. No. 237 (Tr. Day 4) at

86.) She admitted that some water had also percolated laterally through the Non–Registered Site's dikes. (Doc. No. 230–1 (Perry Wr. Test.) at 18.)

329. She testified, however, that the total amount of groundwater reaching the Cumberland River from beneath the Non–Registered Site is very small compared to the volume of flow in the river itself. (Id. at 17.)

330. Finally, Perry testified that capping the Non–Registered Site would result in substantial decrease in the groundwater flow through it. (Id. at 21–22.)

331. On cross examination, Perry admitted that, unlike in the NRL Landfill area, there are karst features in the vicinity of the Ash Pond Complex. (Doc. No. 237 (Tr. Day 4) at 59.)

***822** 332. She also conceded that karst features have historically been mapped beneath the Ash Pond Complex. (Id.)

333. Perry also confirmed that recent samples from some wells in the vicinity of the Ash Pond Complex showed arsenic levels in excess of MCLs. (Id. at 74–79.)

334. Based on its direct observation of her demeanor, candor, and responsiveness, the Court found Perry to be generally credible, albeit with the caveat that her professional association with AECOM could be reasonably inferred to predispose her to a favorable view of TVA's positions and

practices.

5. Testimony of Robert Alexander

335. Robert Alexander is a TDEC official involved in the drafting of NPDES permits. (Doc. No. 237 (Tr. Day 4) at 95–96.) Alexander reports to Janjic. (Id. at 102.) He holds a bachelor's degree in Civil Engineering from Tennessee Tech and a master's degree in Engineering from North Carolina State. (Id. at 95.)

336. Alexander was not the principal author of the Gallatin Plant's 2012 renewed permit, but he did perform work on it in the status of senior reviewer. (Id. at 96.)

337. Alexander testified that a 2016 TDEC inspection of the Gallatin Plant formally found no violations and noted a lack of problems with or observed seeps in the Ash Pond Complex's dykes. (Id. at 97–99 (discussing J. Ex. 249; J. Ex. 250).)

338. Based on its direct observation of his demeanor, candor, and responsiveness, the Court found Alexander to be credible on the limited topic of his testimony.

6. Testimony of John Kammeyer

339. John Kammeyer is TVA's Vice President of Civil Projects, Coal Combustion Products Management, and Equipment Support Services. He has a broad range of responsibilities related to the management of coal ash waste at the Gallatin Plant and other facilities, including overseeing the closure

of the Ash Pond Complex. He has a bachelor's degree in Mechanical Engineering from the Ohio State University and is a licensed professional engineer in the State of Tennessee. (Doc. No. 237 (Tr. Day 4) at 104; Doc. No. 230–2 (Kammeyer Wr. Test.) at 1–2; J. Ex. 264.)

340. The parties have stipulated and agreed that Kammeyer is qualified as an expert by knowledge, skill, experience, training, or education pursuant to Federal Rule of Evidence 702. (Doc. No. 221.)

341. Kammeyer testified that, in 2011, TVA initiated a $730 million project at the Gallatin Plant for the construction of facilities and equipment that would allow TVA to convert the Plant's management of coal ash waste from wet storage—that is, storage in ponds—to dry storage at the NRL landfill. (Doc. No. 230–2 (Kammeyer Wr. Test.) at 6.)

342. Kammeyer then described TVA's 2012 preliminary closure plan for the Ash Pond Complex, which called for the dewatering and closure of ponds A and E, accompanied by the placement of a geosynthetic cap. (Id. at 6−7.)

343. Kammeyer next detailed TVA's process for evaluating closure in place versus closure by removal, as published in 2016. (Id. at 10 (discussing J. Ex. 268).) The rationale provided by Kammeyer generally echoed the reasoning provided earlier by Lang. (Id.)

344. Kammeyer explained that TVA had already devoted substantial resources and efforts to the

closure of the Ash Pond Complex and will continue to do so. (Id. at 11.)

345. Kammeyer offered cost estimates for both closure in place and closure by removal, suggesting that the costs of closure ***823** by removal would be substantially higher. Similarly, he estimated that merely performing improvements on the closure currently in place for the Non–Registered Site would be substantially less expensive than excavating the site. (Id. at 14–15.)

346. On cross examination, Kammeyer testified that TVA's operating revenue for the 2016 fiscal year was around $10.6 billion, and that TVA had paid out bonuses and incentives to a large number of employees. (Doc. No. 237 (Tr. Day 4) at 131.)

347. Based on its direct observation of his demeanor, candor, and responsiveness, the Court found Kammeyer to credibly express the position of TVA. By virtue of his position, however, the Court afforded greater weight to other experts' discussions of the relative merits and demerits of the closure possibilities.

IV. CONCLUSIONS OF LAW

A. The CWA

348. "In 1972, Congress enacted the Clean Water Act ('CWA' or 'Act') 'to restore and maintain the chemical, physical, and biological integrity of the Nation's waters.' " Yadkin Riverkeeper, Inc. v. Duke Energy Carolinas, LLC, 141 F.Supp.3d 428, 434–35 (M.D.N.C. 2015) (quoting 33 U.S.C. § 1251(a)). The

CWA "is the principal legislative source of the [Environmental Protection Agency's ("EPA")] authority—and responsibility—to abate and control water pollution." Waterkeeper Alliance, Inc. v. EPA, 399 F.3d 486, 491 (2d Cir. 2005).

349. The bedrock of the CWA is "a default regime of strict liability," whereby the discharge of any covered pollutant from a point source into the Nation's waters amounts to a violation of the statute unless subject to a specific exception. Sierra Club v. ICG Hazard, LLC, 781 F.3d 281, 284 (6th Cir. 2015) (quoting Piney Run Pres. Ass'n v. Cty. Comm'rs of Carroll Cty., 268 F.3d 255, 265 (4th Cir. 2001)). In relevant part, the CWA provides that "except as in compliance with [certain sections] of this title, the discharge of any pollutant by any person shall be unlawful." 33 U.S.C. § 1311. "The term 'discharge of a pollutant' ... means (A) any addition of any pollutant to navigable waters from any point source, [or] (B) any addition of any pollutant to the waters of the contiguous zone or the ocean from any point source other than a vessel or other floating craft." 33 U.S.C. § 1362(12).

350. The chief means of qualifying for an exception to the CWA's strict liability regime is compliance with a permit issued under the NPDES. ICG Hazard, 781 F.3d at 284. The NPDES is "a federal permit program designed to regulate the discharge of polluting effluents." Int'l Paper Co. v. Ouellette, 479 U.S. 481, 489, 107 S.Ct. 805, 93 L.Ed.2d 883 (1987). "Generally speaking, the NPDES requires dischargers to obtain permits that place limits on the type and quantity of pollutants that can

be released into the Nation's waters." S. Fla. Water Mgmt. Dist. v. Miccosukee Tribe of Indians, 541 U.S. 95, 102, 124 S.Ct. 1537, 158 L.Ed.2d 264 (2004). Discharge of pollutants into the waters of the United States from a point source without an NPDES permit, or in violation of the terms of an NPDES permit, is a violation of the CWA. 33 U.S.C. §§ 1311(a), 1342(a), 1365(f)(6).

351. "NPDES permits impose limitations on the discharge of pollutants, and establish related monitoring and reporting requirements, in order to improve the cleanliness and safety of the Nation's waters." Friends of the Earth, Inc. v. Laidlaw Envtl. Servs. (TOC), Inc., 528 U.S. 167, 174, 120 S.Ct. 693, 145 L.Ed.2d 610 (2000). "Noncompliance with a permit constitutes a violation of the Act." Id.; see 40 C.F.R. § 122.41(a) (2015).

***824** 352. As the system is currently designed, "[t]he [EPA] initially administers the NPDES permitting system for each State, but a State may apply for a transfer of permitting authority to state officials." Nat'l Ass'n of Home Builders v. Defs. of Wildlife, 551 U.S. 644, 650, 127 S.Ct. 2518, 168 L.Ed.2d 467 (2007) (citing 33 U.S.C. §§ 1251(b), 1342). In December of 1977, the EPA authorized the State of Tennessee to issue some types of NPDES permits, which the State grants and enforces through TDEC. See 56 Fed. Reg. 21,376 (1991). In 1986, the EPA expanded that authorization to include the authority to issue and oversee permits for federal facilities such as the Gallatin Plant. 51 Fed. Reg. 32,834 (1986).

B. The Permit Shield

353. The "permit shield" provision of the CWA provides that "[c]ompliance with a permit issued pursuant to [the NPDES] shall be deemed compliance" with the relevant portions of the CWA. 33 U.S.C. § 1342(k). The purpose of the permit shield is "to relieve [permit holders] of having to litigate in an enforcement action the question whether their permits are sufficiently strict." ICG Hazard, 781 F.3d at 285 (quoting E.I. du Pont de Nemours & Co. v. Train, 430 U.S. 112, 138 n.28, 97 S.Ct. 965, 51 L.Ed.2d 204 (1977)).

354. The Sixth Circuit has adopted a two-pronged analysis for determining whether the permit shield will apply to the discharges alleged in a particular action: "[f]irst, the permit holder must comply with the CWA's reporting and disclosure requirements"; and, "[s]econd, ... the discharges must be within the permitting authority's 'reasonable contemplation.' " Id. (quoting Piney Run, 268 F.3d at 268).

355. The question of "reasonable contemplation" focuses in particular on whether the alleged discharges were "within the reasonable contemplation of the permitting authority *during the permit application process*." Id. (quoting Piney Run, 268 F.3d at 267) (emphasis added). The question of reasonable contemplation is closely tied to a review of what the permittee itself disclosed, because "the scope of the permit as well as the discharge limitations contained therein are based largely on information provided by the permit applicant." In Re Ketchikan Pulp Co., 7 E.A.D. 605, 1998 WL 284964,

at *10 (E.P.A. May 15, 1998).

356. As this Court held on September 9, 2016, "the Court should evaluate every feature of an alleged violation to determine if the relevant discharge or possibility thereof was adequately disclosed and reasonably contemplated," including "the pollutants at issue ... the location of discharge, its magnitude, or any other relevant trait." (Doc. No. 139 at 30.)

357. In its September 9, 2016 ruling, the Court concluded that TVA may be able to rely on the permit shield doctrine with regard to seeps from the Ash Pond Complex if the "specific seeps [at issue] were only of the type contemplated by the [NPDES] permit, and that the seeps' detection, monitoring, reporting, disclosure, and, if necessary, remediation, were handled in full compliance with the permit." (Id. at 32.)

C. Groundwater under the CWA

358. The CWA "prohibits the discharge of pollutants into 'navigable waters' except as in compliance with the Act's provisions." Cape Fear River Watch, Inc. v. Duke Energy Progress, Inc., 25 F.Supp.3d 798, 805 (E.D.N.C. 2014) (citing 33 U.S.C. §§ 1311(a), 1362(12)(A)). "The term 'navigable waters' means the waters of the United States, including the territorial seas." 33 U.S.C. § 1362(7). It is undisputed that the Cumberland River is a water of the United States and that discharges to the river therefore can give rise to liability ***825** under the CWA. (Doc. No. 226 (J. Stip.) at ¶ 2.)

359. The Cumberland River—like most, if not all, natural bodies of water—is hydrologically connected to the groundwater in the area surrounding it, and therefore it is possible for materials, including pollutants, to be transmitted to the river through that groundwater. Courts, however, have differed with regard to whether the CWA reaches such discharges. Some have held that the Act regulates discharges through hydrologically connected groundwater just as it would any other ordinary discharges. See, e.g., N. Cal. River Watch v. City of Healdsburg, 496 F.3d 993, 1000 (9th Cir. 2007) (holding that the CWA applied based on hydrologic connection to waters of the United States); Haw. Wildlife Fund v. Cty. of Maui, 24 F.Supp.3d 980, 995 (D. Haw. 2014) (concluding "that Congress sought to include sufficiently 'confined and discrete' groundwater conduits as 'point sources' under the Act"); Raritan Baykeeper, Inc. v. NL Indus., Inc., No. 09-CV-4117 JAP, 2013 WL 103880, at *15 (D.N.J. Jan. 8, 2013) ("Plaintiffs have sufficiently pleaded that groundwater is a point source because it is hydrologically connected to the river."); Nw. Envtl. Def. Ctr. v. Grabhorn, Inc., No. CV-08-548-ST, 2009 WL 3672895, at *11 (D. Or. Oct. 30, 2009) (concluding, in light of the EPA's regulatory pronouncements, that "the CWA covers discharges to navigable surface waters via hydrologically connected groundwater"); Hernandez v. Esso Standard Oil Co. (P.R.), 599 F.Supp.2d 175, 181 (D.P.R. 2009) (holding that "the CWA extends federal jurisdiction over groundwater that is hydrologically connected to surface waters that are themselves waters of the United States"); Idaho Rural Council v. Bosma, 143 F.Supp.2d 1169, 1180 (D. Idaho 2001)

(finding that "the CWA extends federal jurisdiction over groundwater that is hydrologically connected to surface waters that are themselves waters of the United States"); Mutual Life Ins. Co. v. Mobil Corp., No. Civ. A. 96-CV1781, 1998 WL 160820, at *3 (N.D.N.Y. 1998) (finding complaint alleging "a hydrological connection between the contaminated groundwater and navigable waters" sufficient to state a claim); Williams Pipe Line Co. v. Bayer Corp., 964 F.Supp. 1300, 1319 (S.D. Iowa 1997) (observing that "[t]he majority of courts have held that groundwaters that are hydrologically connected to surface waters are regulated waters of the United States, and that unpermitted discharges into such groundwaters are prohibited under section 1311"); Wash. Wilderness Coal. v. Hecla Mining Co., 870 F.Supp. 983, 990 (E.D. Wash. 1994) (reasoning that "since the goal of the CWA is to protect the quality of surface waters, any pollutant which enters such waters, whether directly or through groundwater, is subject to regulation by NPDES permit").

360. Other courts, however, have been skeptical of or outright rejected claims that the CWA reaches discharges through groundwater, typically on the ground that groundwater itself is not navigable waters. See, e.g., Rice v. Harken Exploration Co., 250 F.3d 264, 272 (5th Cir. 2001) ("In light of Congress's decision not to regulate ground waters under the CWA/OPA, ... we hold that a generalized assertion that covered surface waters will eventually be affected by remote, gradual, natural seepage from the contaminated groundwater is insufficient to establish liability under the OPA."); Vill. of Oconomowoc Lake v. Dayton Hudson Corp., 24 F.3d

962, 965 (7th Cir. 1994) (holding that CWA jurisdiction does not extend to groundwater contamination caused by drainage from an artificial pond because "[n]either the Clean Water Act nor the EPA's definition asserts authority over ground waters, just because these may be hydrologically connected with surface waters"); ***826** Tri–Realty Co. v. Ursinus Coll., 124 F.Supp.3d 418, 459 (E.D. Pa. 2015) (explaining that the "discharge of pollutants into navigable waters occurring only through migration of groundwater and uncontrolled soil runoff" is beyond the scope of the CWA because it represents "nonpoint source" pollution); Cape Fear River Watch, Inc., 25 F.Supp.3d at 810 (holding that "Congress did not intend for the CWA to extend federal regulatory authority over groundwater, regardless of whether that groundwater is eventually or somehow 'hydrologically connected' to navigable surface waters"); Umatilla Waterquality Protective Ass'n, Inc. v. Smith Frozen Foods, Inc., 962 F.Supp. 1312, 1320 (D. Or. 1997) (holding that "discharges of pollutants into groundwater are not subject to the CWA's NPDES permit requirement even if that groundwater is hydrologically connected to surface water"); Cooper Indus., Inc. v. Abbott Labs., No. 93-CV-193, 1995 WL 17079612, at *3 (W.D. Mich. May 5, 1995) ("Even assuming that the migration of ground water led to the pollution of the Fawn River, which further led to the pollution of the Site, such allegations are insufficient to state a cause of action under the FWPCA.").

361. The Court agrees with those courts that "view[ ] the issue not as whether the CWA regulates the discharge of pollutants into groundwater itself

but rather whether the CWA regulates the discharge of pollutants to navigable waters via groundwater." Yadkin, 141 F.Supp.3d at 445. "[I]t would hardly make sense for the CWA to encompass a polluter who discharges pollutants via a pipe running from the factory directly to the riverbank, but not a polluter who dumps the same pollutants into a man-made settling basin some distance short of the river and then allows the pollutants to seep into the river via the groundwater." N. Cal. River Watch v. Mercer Fraser Co., No. C-04-4620 SC, 2005 WL 2122052, at *2 (N.D. Cal. Sept. 1, 2005).

362. Construing the CWA to reach at least some discharges through groundwater is also consistent with guidance from the EPA. See, e.g., Nat'l Pollutant Discharge Elimination Sys. Permit Regulation and Effluent Limitations Guidelines and Standards for Concentrated Animal Feeding Operations, 66 Fed. Reg. 2960, 3017 (Jan. 12, 2001) ("As a legal and factual matter, EPA has made a determination that, in general, collected or channeled pollutants conveyed to surface waters via ground water can constitute a discharge subject to the Clean Water Act."); Reissuance of NPDES General Permits for Storm Water Discharges From Constr. Activities, 63 Fed. Reg. 7858, 7881 (Feb. 17, 1998) ("EPA interprets the CWA's NPDES permitting program to regulate discharges to surface water via groundwater where there is a direct and immediate hydrologic connection"); Amendments to the Water Quality Standards Regulation That Pertain to Standards on Indian Reservations, 56 Fed. Reg. 64876, 64892 (Dec. 12, 1991) ("[T]he Act requires NPDES permits for discharges to

groundwater where there is a direct hydrological connection between groundwaters and surface waters. In these situations, the affected groundwaters are not considered 'waters of the United States' but discharges to them are regulated because such discharges are effectively discharges to the directly connected surface waters.").

363. Nevertheless, the Court agrees that "a generalized assertion that covered surface waters will eventually be affected by remote, gradual, natural seepage from the contaminated groundwater is insufficient to establish liability" under the CWA. Rice, 250 F.3d at 272. Another judge of this Court has considered the CWA's treatment of groundwater and concluded ***827** that discharges through groundwater may be actionable, but with the crucial caveat that a plaintiff must be able to "prove a link between contaminated ground waters and navigable waters" through which the plaintiff can "trace pollutants from their source to surface waters." Ass'n Concerned Over Res. & Nature, Inc. v. Tenn. Aluminum Processors, Inc., No. 1:10-00084, 2011 WL 1357690, at *18 (M.D. Tenn. Apr. 11, 2011). The Court agrees with Judge Haynes' general formulation.

364. The Court notes, however, that the requirement that a plaintiff be able to trace pollutants' passage from their source to navigable waters does not require that the plaintiff be able map every inch of that path with perfect precision. To some degree, a hydrologic connection's traceability is a feature not of the connection itself, but the physical and technological limitations surrounding the

parties' observation of it. In a world of perfect knowledge, all hydrologic connections, no matter how general or attenuated, would be traceable—but that does not mean that Congress intended to reach all such connections with the CWA. By the same token, in the considerably more technologically primitive world of the past, one presumably could not trace water flows that could not be seen with the naked eye, but those invisible hydrological connections were no less real or substantial than they are today. Perfect traceability is ultimately a technological and epistemological issue, not a legal one. As long as a connection is shown to be real, direct, and immediate, there is no statutory, constitutional, or policy reason to require that every twist and turn of its path be precisely traced. See, e.g., Reissuance of NPDES General Permits for Storm Water Discharges From Constr. Activities, 63 Fed. Reg. at 7881 (interpreting the NPDES program to "regulate discharges to surface water via groundwater where there is a direct and immediate hydrologic connection"); Tenn. Aluminum Processors, Inc., 2011 WL 1357690, at *17 ("[O]f those courts that find that CWA jurisdiction applies to groundwater, the groundwater must have a direct hydrologic connection to surface waters that are waters of the United States.").

365. Accordingly, the Court concludes that a cause of action based on an unauthorized point source discharge may be brought under the CWA based on discharges through groundwater, if the hydrologic connection between the source of the pollutants and navigable waters is direct, immediate, and can generally be traced.

D. Point Source vs. Nonpoint Source Discharges

366. The CWA divides "the sources of water pollution into categories: 'point source,' 33 U.S.C. § 1362(14); and 'nonpoint source' 33 U.S.C. § 1288." Nat'l Wildlife Fed'n v. Consumers Power Co., 862 F.2d 580, 582 (6th Cir. 1988).

The CWA defines "point source" as

> any discernible, confined and discrete conveyance, including but not limited to any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, or vessel or other floating craft, from which pollutants are or may be discharged. This term does not include agricultural stormwater discharges and return flows from irrigated agriculture.

33 U.S.C.A. § 1362(14).

367. "Nonpoint source" is a catch-all category encompassing any water pollution problems that do not involve a discharge from a point source. Consumers Power Co., 862 F.2d at 582; Nat'l Wildlife Fed'n v. Gorsuch, 693 F.2d 156, 165–66 & n.28 (D.C. Cir. 1982). "Nonpoint sources include pollution from diffuse land use activities ***828** such as agriculture, construction and mining that enter the waters primarily through indiscrete and less identifiable natural processes such as runoffs, precipitation and percolation." Cordiano v. Metacon Gun Club, Inc.,

575 F.3d 199, 220 (2d Cir. 2009) (quoting Frank P. Grad, Treatise on Environmental Law § 3.03 (updated 2009)).

368. With regard to point source pollution, the CWA "generally prohibits the discharge of any effluent into a navigable body of water unless the point source has obtained an NPDES permit." Int'l Paper, 479 U.S. at 489, 107 S.Ct. 805. "Where the source of a pollutant is a point source, and the pollutant is discharged into navigable waters, the source must obtain [an NPDES] permit limiting and controlling both the amount and type of pollutants which can be lawfully discharged." Consumers Power Co., 862 F.2d at 582.

369. In contrast, the CWA "leaves the regulation of nonpoint source pollution to the states." Cordiano, 575 F.3d at 219; see also Consumers Power Co., 862 F.2d at 587–88 ("Although an essential element in a national effort to control water pollution, the NPDES permit program stands alongside of the system controlling 'nonpoint sources' of pollution .... State water quality standards are the basis of the 'nonpoint source' program.").

370. The Ash Pond Complex, as a series of discernible, confined, and discrete ponds that receive wastewater, treat that wastewater, and ultimately convey it to the Cumberland River, is a point source. See Yadkin, 141 F.Supp.3d at 443–44 ("The coal ash lagoons ... are surface impoundments designed to hold accumulated coal ash in the form of liquid waste.... As such, the coal ash lagoons appear to be confined and discrete.... As confined and discrete

conveyances, the lagoons fall within the CWA's definition of 'point source.' "); United States v. Alpha Nat. Res., Inc., No. 2:14-11609, 2014 WL 6686690, at *1 (S.D. W.Va. Nov. 26, 2014) (referring to "various impoundments and settlement ponds ... and other conveyances that qualify as 'point sources' emitting 'pollutants' as those two terms are defined under federal law for [CWA] purposes").

371. Discharges from the Ash Pond Complex are therefore point source discharges on which CWA liability may be premised.

372. TVA argues that the Non–Registered Site, as a largely dewatered former ash pond system that is exposed to water primarily through runoff and rainfall, is not a point source. (Doc. No. 242 at ¶ 311.)

373. "The concept of a point source was designed [to embrace] the broadest possible definition of any identifiable conveyance from which pollutants might enter the waters of the United States." Residents Against Indus. Landfill Expansion (R.A.I.L.E.) v. Diversified Sys., Inc., 804 F.Supp. 1036, 1038 (E.D. Tenn. 1992) (quoting United States v. Earth Scis., Inc., 599 F.2d 368, 373 (10th Cir. 1979)).

374. 33 U.S.C. § 1314(f) grants "the EPA the power to issue guidelines for identifying and evaluating the nature and extent of nonpoint sources of pollutants," Consumers Power Co., 862 F.2d at 583, and to issue "processes, procedures, and methods to control pollution resulting from ... the disposal of pollutants in ... subsurface excavations." 33 U.S.C. § 1314(f)(D).

375. The EPA has described nonpoint source pollution as follows:

> [Nonpoint source pollution] is caused by diffuse sources that are not regulated as point sources and normally is associated with agricultural, silvicultural and urban runoff, runoff from construction activities, etc. Such pollution results in the ***829** human-made or human-induced alteration of the chemical, physical, biological, and radiological integrity of water. In practical terms, nonpoint source pollution does not result from a discharge at a specific, single location (such as a single pipe) but generally results from land runoff, precipitation, atmospheric deposition, or percolation.

Cordiano, 575 F.3d at 220 (quoting EPA Office of Water, Nonpoint Source Guidance 3 (1987)).

376. Nevertheless, pollution enabled by runoff, precipitation, and/or percolation of water can, in some instances, qualify as point source pollution. For example, the EPA has provided that point source pollution "includes additions of pollutants into waters of the United States from ... surface runoff which is collected or channelled by man." 40 C.F.R. § 122.2(b); see also Sierra Club v. Abston Const. Co., 620 F.2d 41, 45 (5th Cir. 1980) ("Gravity flow, resulting in a discharge into a navigable body of water, may be part of a point source discharge if the

miner at least initially collected or channeled the water and other materials.").

377. TVA suggests that, because the EPA has expressly defined point source discharges to include discharges from "surface runoff which is collected or channelled by man," then the CWA, by implication, cannot reach any discharges enabled by infiltration of rainwater that was *not* channeled by human action. See Cordiano, 575 F.3d at 221 ("By implication, surface water runoff which is neither collected nor channeled constitutes nonpoint source pollution and consequentially is not subject to the CWA permit requirement."). That argument, however, fails to resolve this matter for a number of reasons. First, discharges from the Non–Registered Site involve not merely surface runoff but groundwater. Second, the regulation cited by TVA is expressly a non-exhaustive list of regulated discharges. See 40 C.F.R. § 122.2(b).

378. Most importantly, 40 C.F.R. § 122.2, when understood in the context of the definition of point source itself, clearly does not support such a broad implication. The regulation's reference to channeling of runoff in 40 C.F.R. § 122.2(b) reflects the fact that, where runoff is channeled by human action, channeling in and of itself satisfies the requirement of a discernible, confined, and discrete conveyance. In other words, unless surface runoff is directed into some kind of discrete drainage channel, the requirement for a discernible, confined, and discrete conveyance has not yet been satisfied. That requirement, though, can still be satisfied by some other vessel that gives rise to the ultimate discharge.

Here, Plaintiffs do not rely on any alleged drainage channel as their point source, but rather a wholly separate discernible, confined, and discrete conveyance—the entire abandoned ash pond system itself.

379. When a preexisting discrete container of pollutants "fails because of flaws in the construction ..., with resulting discharge, ... the escape of liquid from the confined system is from a point source. [Even if] the source of the excess liquid is rainfall or snow melt, this is not the kind of general runoff considered to be from nonpoint sources ...." Earth Scis., Inc., 599 F.2d at 374. The Non–Registered Site presents just such a case: pollutants have already been confined, and infiltration by outside water is merely the catalyst for the unauthorized discharges.

380. In other words, while TVA has admittedly not actively sought to channel the flow of *precipitation*, the Non–Registered Site meets the definition of "point source" because TVA has "channel[ed] the flow of pollutants" themselves, Sierra Club v. Va. Elec. & Power Co., 247 F.Supp.3d 753, 763, 2017 WL 1095039, at *8 (E.D. Va. 2017), by forming a discrete, unlined concentration ***830** of coal ash. Nothing in the CWA requires that every component passing through a point source be channeled by human action, as long the source itself meets the threshold requirements of a point source.

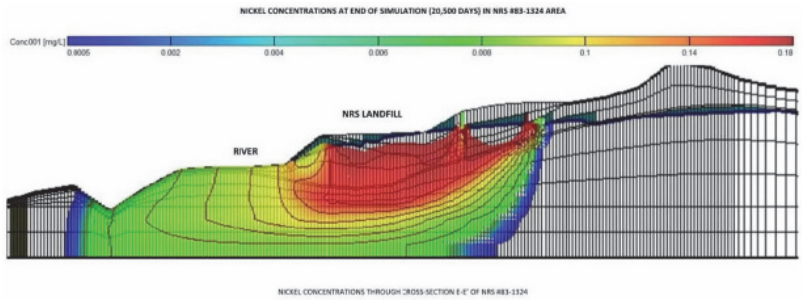
381. Because EPA regulations do not definitively resolve whether the Non–Registered Site should be considered a point source, the Court must be guided by the language of the statutory definition, which

requires that point source pollution be tied to a "[1] discernible, [2] confined and [3]discrete [4] conveyance." In other words, "the ultimate question is whether pollutants were discharged from discernible, confined, and discrete conveyance[s] [by any] means." Va. Elec. & Power Co., 247 F.Supp.3d at 763, 2017 WL 1095039, at *7 (quoting Ohio Valley Envtl. Coal., Inc. v. Hernshaw Partners, LLC, 984 F.Supp.2d 589, 599 (S.D. W.Va. 2013)).

382. Prior to 1970, when the Non–Registered Site was a functioning ash pond wastewater treatment system, it would have met the current definition of point source for reasons similar to those that apply to the Ash Pond Complex today. The purpose of a coal ash pond is "to concentrate coal ash, and its constituent pollutants, in one location. That one location channels and conveys [pollutants] directly into the groundwater and thence into the surface waters. Essentially, they are discrete mechanisms that convey pollutants from the ... power plant to the river." Va. Elec. & Power Co., 247 F.Supp.3d at 763, 2017 WL 1095039, at *7.

383. Although the Non–Registered Site has been largely dewatered, TVA has presented no evidence to suggest that the dewatering process would change the fact that the former ash pond system is discernible, discrete, and confined. All of the evidence presented to the Court suggests that the Non–Registered Site is still the home of a discrete, man-made area that was filled, by TVA, with concentrated and still-present coal ash waste. Recent documentation confirms that assessment. For example, a depiction of predicted nickel

contamination from the 2014 Arcadis Report depicts a discernible, discrete area of high concentration bounded plainly by areas of low concentration—in other words, a discernible, discrete, confined and manmade concentration of waste:



(J. Ex. 59 at TVGF_004976.) The requirement that the relevant vessel be discernible, discrete, and confined plainly continues to be met.

384. TVA argues next that the Non–Registered Site cannot be a point source because it is no longer a "conveyance." However, where a discernible, discrete, and confined impoundment is "unlined and leaking pollutants" it is also, by definition, "*conveying* pollutants" through those leaks. Yadkin, 141 F.Supp.3d at 444 (emphasis ***831** added). A discrete conveyance " 'need only convey the pollutant to navigable waters' for it to be a point source discharge." Sierra Club v. BNSF Ry. Co., No. C13-967-JCC, 2016 WL 6217108, at *8 (W.D. Wash. Oct. 25, 2016) (quoting S. Florida Water Mgmt. Dist., 541 U.S. at 105, 124 S.Ct. 1537). Accordingly, if Plaintiffs are able to establish ongoing unauthorized discharges from the Non–Registered Site, they will also have established that it is a conveyance.

385. In sum, this Court concludes, based on the entire trial record, that Plaintiffs have proven by a preponderance of the evidence that any ongoing discharges of pollutants from the Ash Pond Complex and Non–Registered Site are discharges from discernible, confined, and discrete conveyances, and therefore are point source discharges under the CWA.

E. Citizen Enforcement and the Diligent Prosecution Bar

386. "Although the primary responsibility for enforcement [of the CWA] rests with the state and federal governments, private citizens provide a second level of enforcement and can serve as a check to ensure the state and federal governments are diligent in prosecuting Clean Water Act violations." Sierra Club v. Hamilton Cty. Bd. of Cty. Comm'rs, 504 F.3d 634, 637 (6th Cir. 2007). Accordingly, any citizen with constitutional standing to do so may file an action "against any person ... who is alleged to be in violation of ... an effluent standard or limitation" of the CWA. 33 U.S.C. § 1365(a)(1).

387. The statute of limitations applicable to a citizen enforcement suit under the CWA is five years. 28 U.S.C. § 2462; see Pub. Interest Research Grp. of N.J., Inc. v. Powell Duffryn Terminals Inc., 913 F.2d 64, 74–75 (3d Cir. 1990) (holding that the five-year statute of limitations, 28 U.S.C. § 2462, applies to citizen suits under the CWA); Frilling v. Honda of Am. Mfg., Inc., No. C-3-96-181, 1996 WL 1619348, at *8–9 (S.D. Ohio Oct. 21, 1996) (same).

388. Before filing suit alleging a CWA violation, the citizen must provide sixty days' notice to the alleged violator, the EPA, and the State in which the alleged violation occurred. 33 U.S.C. § 1365(b)(1)(A). "The 60–day notice provides federal and state governments with the time to initiate their own enforcement actions." Hamilton Cty. Bd. of Cty. Comm'rs, 504 F.3d at 637. If the United States or relevant state government does commence proceedings, the proposed citizen suit may be blocked by what is known as the "diligent prosecution bar."

389. The diligent prosecution bar provides that a citizen cannot file an enforcement suit "if the Administrator or State has commenced and is diligently prosecuting a civil or criminal action in a court of the United States, or a State to require compliance with the standard, limitation, or order" on which the violation is premised. 33 U.S.C. § 1365(b)(1)(B). "Section 1365(b)(1)(B) does not require government prosecution to be far-reaching or zealous. It requires only diligence. Nor must an agency's prosecutorial strategy coincide with that of the citizen-plaintiff." Karr v. Hefner, 475 F.3d 1192, 1197 (10th Cir. 2007). "[A] CWA enforcement action will be considered diligent where it is capable of requiring compliance with the Act and is in good faith calculated to do so." Piney Run Pres. Ass'n v. Cty. Comm'rs of Carroll Cty., Md., 523 F.3d 453, 460 (4th Cir. 2008) (citation omitted).

390. "[A] diligent prosecution bar only applies to those issues sought to be addressed in a citizen action that overlap with those issues sought to be addressed by the government's suit." ***832** United

States v. Bd. of Cty. Comm'rs of Hamilton Cty., Ohio, No. 1:02 CV 00107, 2005 WL 2033708, at *11 (S.D. Ohio Aug. 23, 2005) (citing Frilling v. Vill. of Anna, 924 F.Supp. 821, 836 (S.D. Ohio 1996)).

391. The question of whether certain allegations are subject to the diligent prosecution bar is "normally determined as of the time of the filing of a complaint." Id. at *12 (quoting Chesapeake Bay Found. v. Am. Recovery Co., 769 F.2d 207, 208 (4th Cir. 1985)); see also Ohio Valley Envtl. Coal. v. Maple Coal Co., 808 F.Supp.2d 868, 883 (S.D. W.Va. 2011) ("First, a court must determine whether a prosecution by the state (or the EPA Administrator) to enforce the same 'standard, order, or limitation' was pending on the date that the citizens' suit commenced. Second, if the answer to the previous question is affirmative, a court must also determine whether the prior pending action was being 'diligently prosecuted' by the state at the time that the citizens' suit was filed."). Such a rule frees the Court from the burden of having to audit and re-assess the relevant government's enforcement actions throughout the pendency of the citizen action.

392. Basing the Court's application of the diligent prosecution bar on the status of litigation at the time of the filing of the citizen complaint is also the reading most consistent with the language of the bar itself, which is expressly addressed to whether an action "may be commenced." 33 U.S.C. § 1365(b).

393. In its ruling of September 9, 2016, the Court considered the diligent prosecution bar in the context

of the State Enforcement Action. The Court concluded that, based on the information before it, the State's prosecution of the State Enforcement Action appeared to have been diligent at the time of the filing of the Complaint in this matter. The Court therefore concluded that the allegations in this matter that directly overlapped with the allegations raised in the State's complaint would be dismissed. (Doc. No. 139 at 20.)

394. The Court based its ruling only on the conclusion that the State's enforcement efforts appeared to have been diligent as of the April 14, 2015 filing of the Complaint in this matter. The Court did not and will not make any determination that the State's subsequent activities in the State Enforcement Action have amounted to diligent prosecution. The Court's prior ruling moreover should not be read as creating any inference or presumption that the eventual resolution of the State Enforcement Action will itself reflect diligent prosecution, or that a claim filed after April 14, 2015, should be subject to the diligent prosecution bar.

395. In the September 9, 2016 ruling, the Court identified two sets of allegations in the federal Complaint that were not barred by the pendency of the State Enforcement Action or otherwise subject to dismissal: (1) TVA's "discharges from the Non–Registered Site into the Cumberland River," as opposed to merely into surrounding groundwater; and (2) its "discharges from the Ash Pond Complex via hydrologic flows that are not seeps alone." (Id. at 42.) As the Court used the term, "seeps" refers to "slow pore-space seepage of contaminants," as

opposed to "conduit flow ... that provides rapid connectivity with little to no pollutant attenuation." (Id. at 6 (quoting Doc. No. 1 at ¶ 152).) All claims, under any theory of liability, that did not arise out of those two classes of allegations were dismissed. (Id. at 42.)

396. No evidence presented at trial, however, suggests that the Court should expand its application of the diligent prosecution bar beyond the substantial body of claims already dismissed. TVA has argued that the Court should dismiss the remaining claims because the Plaintiffs did not present evidence at trial to establish a lack ***833** of diligent prosecution. (Doc. No. 242 at 14.) TVA, however, presented no evidence to suggest that the surviving federal claims—which remained in the case specifically because they did not appear to be encompassed by the complaint in the State Enforcement Action—were being prosecuted by the State at all, let alone diligently. The Court will not simply assume that claims are barred absent any evidence to the contrary.

397. Accordingly, the Court will not dismiss any additional aspects of Plaintiffs' claims pursuant to the diligent prosecution bar. In light of the Court's September 9, 2016 ruling, Plaintiffs may prevail if they can establish actionable CWA violations premised on one or both of the allegations still pending before the court: discharges from the Non–Registered Site into the Cumberland River; and discharges from the Ash Pond Complex via hydrologic flows that are not seeps alone.

F. Ongoing or Intermittent vs. Wholly Past Violations

398. The citizen suit provision of the CWA does not permit a plaintiff to bring suit for "wholly past violations" of the statute. Gwaltney of Smithfield, Ltd. v. Chesapeake Bay Found., Inc., 484 U.S. 49, 64, 108 S.Ct. 376, 98 L.Ed.2d 306 (1987). "[T]he harm sought to be addressed by the citizen suit [must] lie[ ] in the present or future, not in the past." Id. at 59, 108 S.Ct. 376. "[O]nce the polluter ceases his active pollution, the violation is wholly past." Crigler v. Richardson, No. 3:08-681, 2010 WL 2696506, at *5 (M.D. Tenn. July 7, 2010).

399. In order to state a claim for citizen enforcement of the CWA, then, a plaintiff must rely on "a good-faith allegation of continuous or intermittent violation" of the CWA, including "a reasonable likelihood that a past polluter will continue to pollute in the future." Ailor v. City of Maynardville, Tenn., 368 F.3d 587, 597–98 (6th Cir. 2004) (quoting Gwaltney, 484 U.S. at 57, 108 S.Ct. 376).

400. At trial, "[a] citizen-plaintiff may establish that a violation was ongoing either '1) by proving violations that continue on or after the date the complaint is filed, or 2) by adducing evidence from which a reasonable trier of fact could find a continuing likelihood of a recurrence in intermittent or sporadic violations.' " Allen Cty. Citizens for Env't, Inc. v. BP Oil Co., 966 F.2d 1451 (6th Cir. 1992) (unpublished) (quoting Chesapeake Bay Found., Inc. v. Gwaltney of Smithfield, Ltd., 844 F.2d 170, 171–72 (4th Cir. 1988)).

G. Burden of Proof

401. "[A] party who brings a citizens' suit pursuant to the CWA is acting in the role of a private attorney general, based on the government's lack of enforcement action, in order to vindicate the rights of society as a whole, rather than to vindicate his own private rights." DP Marina, LLC v. City of Chattanooga, Tenn., 41 F.Supp.3d 682, 689 (E.D. Tenn. 2014).

402. As the party bringing suit, Plaintiffs bear the burden of establishing the elements of a CWA violation. See Gwaltney, 484 U.S. at 66, 108 S.Ct. 376 ("If [the CWA] case proceeds to trial on the merits ... the plaintiff must prove the allegations in order to prevail.").

403. "To succeed on a § 1365 citizen suit to enforce § 1311, a plaintiff must establish three elements: (1) that the defendant unlawfully discharged or is discharging a 'pollutant'; (2) that the discharge emanated or is emanating from a 'point source'; and (3) that the pollutant was discharged or is being discharged into 'navigable waters.' " Apalachicola Riverkeeper v. Taylor Energy Co., LLC, 954 F.Supp.2d 448, 454 (E.D. La. 2013).

***834** 404. Because one element of the cause of action is that the discharge be unlawful, Plaintiffs bear the initial burden of demonstrating that the discharge at issue is of the type prohibited by the CWA.

405. TVA argues that Plaintiffs therefore also bear the burden of establishing that their claim is

not barred by the permit shield provision. Insofar as TVA's invocation of the permit shield is based on the argument that TVA is in compliance with all of the express terms of its NPDES permit, TVA is correct: in such cases the question of whether there is a CWA violation and whether the permit shield applies are one and the same.

406. As part of their prima facie case, Plaintiffs must prove any alleged violation of the permit. See Tamaska v. City of Bluff City, Tenn., 26 Fed.Appx. 482, 485 (6th Cir. 2002) ("A citizen may establish that a violation is ongoing ... by *proving violations* that continue on or after the date the complaint is filed ...."). Where the application of the permit shield is premised on the discharge being wholly lawful under the express terms of the permit, the applicability of the shield is therefore subsumed by Plaintiffs' initial burden to show the unlawfulness of the discharge.

407. As the Sixth Circuit has interpreted the CWA's permit shield provision, however, it protects more than merely discharges that are lawful under the terms of the relevant NPDES permit, but all "discharges ... within the permitting authority's 'reasonable contemplation' " when the permit was issued. ICG Hazard, 781 F.3d at 286 (quoting Piney Run, 268 F.3d at 268). Plaintiffs' prima facie CWA case requires no such showing regarding the behind-the-scenes details of the permitting process.

408. The structure of the CWA further suggests that invocation of the permit shield goes beyond the mere threshold question of lawfulness encompassed

by a plaintiff's prima facie case. Section 1311(a) forbids point source discharges other than those "in compliance with" certain other sections of the CWA, including 33 U.S.C. § 1342. Section 1342(a) empowers the EPA—or, in this case, its designee TDEC—to "issue a permit for the discharge of any pollutant." Accordingly, discharging pollutants as authorized by a permit is already lawful pursuant to section 1342(a)'s incorporation into section 1311—without the need to rely on a separate permit shield provision. Congress, however, did enact such a separate provision, 33 U.S.C. § 1342(k), suggesting that Congress intended to provide a defense beyond that afforded by the permit alone.

409. The language of section 1342(k) confirms that its permit shield involves matters beyond prima facie unlawfulness. A polluter who successfully invokes section 1342(k) is "deemed [in] compliance" with section 1311. To "deem" something as possessing a particular quality as a matter of law—here, compliance—is to rule that it should be "treat[ed] ... as if ... it has qualities that it does not have." DEEM, Black's Law Dictionary (10th ed. 2014). There is no need to "deem" a discharge to be lawful unless the discharge is otherwise *unlawful*. In other words, the permit provision, by its own language, protects some polluters whose actions are on their face in violation of the CWA. The most obvious such class of persons is those protected by the permit shield because their point source discharges of pollutants, though not authorized by permit, were within the permitting authority's reasonable contemplation.

410. The structure, language, and substance of the permit shield therefore all support the conclusion that it cannot merely be subsumed by the Plaintiffs' burden of showing unlawfulness, but instead calls for an additional, separate inquiry into issues ***835** involving the permitting process that extend well beyond the Plaintiffs' prima facie case.

411. Because invocation of the permit shield based on "reasonable contemplation" raises a matter beyond the scope of the prima facie case, it presents a classic affirmative defense. See Ford Motor Co. v. Transp. Indem. Co., 795 F.2d 538, 546 (6th Cir. 1986) ("An affirmative defense raises matters extraneous to the plaintiff's prima facie case; as such, they are derived from the common law plea of 'confession and avoidance.' " (quoting 5 C. Wright & A. Miller, Federal Practice & Procedure § 1270, at 289 (1969))); see also Jones v. Bock, 549 U.S. 199, 212, 127 S.Ct. 910, 166 L.Ed.2d 798 (2007) (holding that exhaustion requirement amounted to an affirmative defense because it involved matters beyond what petitioner was required to establish to show entitlement to relief).

412. The defendant "has the burden of proof on all affirmative defenses." Fonseca v. Consol. Rail Corp., 246 F.3d 585, 590 (6th Cir. 2001). Accordingly, insofar as TVA argues that a facially unlawful discharge is covered by the permit shield merely because it was contemplated by TDEC at the time of the issuance of the NPDES permit, TVA bears the burden of establishing the underlying facts. See Fed. R. Civ. P. 8(c).

413. In summary, Plaintiffs have the initial burden of establishing that TVA (1) discharged and is reasonably likely to continue discharging a pollutant in violation of the CWA and the facial terms of its NPDES permit; (2) that the discharge emanated from a point source; and (3) that the discharges were/are into 'navigable waters'—which, where the discharges alleged involve hydrologically connected groundwater, requires Plaintiffs to show that the hydrologic connection between the source of the pollutants and navigable waters is direct, immediate, and can generally be traced. In light of the Court's earlier dismissal of a portion of Plaintiffs' claims under the diligent prosecution bar, the Plaintiffs can only meet their burden with evidence related to two classes of discharge: discharges from the Non–Registered Site into the Cumberland River; and discharges from the Ash Pond Complex via hydrologic flows that are not seeps alone, with "seeps alone" being defined as "leaks consisting solely of slow pore-space seepage of contaminants." If Plaintiffs meet their initial burden, Defendants bear the burden of establishing that the discharges at issue were within the reasonable contemplation of TDEC at the time of the issuance of TVA's NPDES permit.

V. FINDINGS & CONCLUSIONS ON PLAINTIFFS' CLAIMS

A. The Non–Registered Site

414. Testing and analysis by Sulkin, Quarles, and Vengosh conclusively establishes that coal ash constituents have historically been discharged into the Cumberland River from the Non–Registered Site.

415. The Non–Registered Site, as discussed *supra*, is a point source insofar as it conveys pollutants to the Cumberland River via leaks.

416. Coal ash and its constituents fall under the Clean Water Act definition of "pollutants." See 33 U.S.C. § 1362(6) ("The term 'pollutant' means dredged spoil, solid waste, incinerator residue, sewage, garbage, sewage sludge, munitions, chemical wastes, biological materials, radioactive materials, heat, wrecked or discarded equipment, rock, sand, cellar dirt and industrial, municipal, and agricultural waste discharged into water").

417. The Cumberland River is a navigable water of the United States.

***836** 418. Neither the text of TVA's NPDES permit, nor the permit rationale, nor the evidence at trial regarding the permitting process supports a reading of the permit that authorizes discharges from the Non–Registered Site. Consistently with Janjic's testimony, the Court construes the permit as authorizing and reasonably contemplating coal ash wastewater discharges from the Ash Pond Complex only. TVA is not entitled to protection from the permit shield provision with regard to the Non–Registered Site.

419. The extent of TVA's historical pollution creates difficulties in determining whether unauthorized discharges are continuing or wholly past. Ultimately, however, Plaintiffs have carried their burden of demonstrating that the unauthorized

discharges from the Non–Registered Site are either ongoing or intermittent and likely to reoccur. It is apparent that the Site has leaked historically, and there is no evidence in the record that would permit the Court to infer that the leakage has stopped.

420. While some of the pollution around the Non–Registered Site may be attributable to historical slides rather than leaks, the evidence before the Court convincingly establishes that leaks have historically contributed to contamination. Indeed, it appears that the design of the now-closed ash ponds would have rendered leakage inevitable.

421. There is no evidence to suggest that the 1970 abandonment of the area wholly stopped the area from leaking. Rather, there is significant evidence that it continued to do so thereafter.

422. There is moreover no evidence to suggest that the "closure" of the site decades later wholly stopped the leaking, and in fact at least one of TVA's own experts conceded that the 1998 closure would be considered insufficient to prevent infiltration of rainwater under currently prevailing standards and that seeps from the Non–Registered Site have continued. (See Doc. No. 229–1 (Lang Wr. Test.) at 7–8.)

423. Faced with an impoundment that has leaked in the past and no evidence of any reason that it would have stopped leaking, the Court has no choice but to conclude that the Non–Registered Site has continued to and will continue to leak coal ash waste into the Cumberland River, through rainwater

vertically penetrating the Site, groundwater laterally penetrating the Site, or both.

424. Plaintiffs accordingly have established an ongoing violation of the CWA with regard to the Non–Registered Site. Because this allegation involves discharges to the Cumberland River, it is not barred by the pendency of the State Enforcement Action.

B. The Ash Pond Complex

425. Testing and analysis by Sulkin, Quarles, and Vengosh conclusively establishes that coal ash constituents have historically been discharged into the Cumberland River from the Ash Pond Complex at locations other than the single authorized discharge point at Outfall 001.

426. As discussed *supra*, the Ash Pond Complex is a point source, coal ash waste is a pollutant, and the Cumberland River is a navigable water of the United States.

427. Accordingly, whether Plaintiffs can succeed on their Ash Pond Complex claims depends on the following four issues: (1) whether the discharges are wholly past or ongoing/intermittent and recurring; (2) whether the discharges are of a type that survived the Court's earlier ruling on the diligent prosecution bar; (3) whether Plaintiffs have identified a sufficiently direct connection between relevant groundwater leaks and the waters of the United States; and (4) whether the discharges are entitled to protection under the permit shield doctrine.

837 *1. Continuing Violations

428. It is undisputed that the Ash Pond Complex has historically leaked, and that coal ash waste has historically escaped through those leaks. As with the Non–Registered Site, TVA's history of allowing pollutants to escape from the Ash Pond Complex complicates the investigation of whether any such leaks continue to take place. Although the Court was presented with a great deal of expert evidence regarding the presence of pollutants associated with coal ash in the Cumberland River and the nearby groundwater, none of the science presented was capable of definitively identifying when the relevant pollutants entered the water.

429. The record is silent with regard to detailed, credible evidence of whether the undisputed historical leakage is capable of justifying pollutant concentrations in the amounts observed today.

430. On balance, however, the evidence preponderates toward concluding that the discharges from the Ash Pond Complex are either ongoing or intermittent and recurring. The ponds continue to be unlined. The terrain continues to be karst. There is substantial evidence that the surrounding groundwater is hydrologically connected to the Cumberland River and that some of that groundwater contains coal ash pollutants in significant levels. While the Ash Pond Complex has undergone some repairs, none of those repairs were of the sort that would have negated the fundamental features of the Complex that make it so prone to leak.

431. Accordingly, the Court concludes, based on the preponderance of the evidence, that the evidence of coal ash pollution in the areas of the Cumberland River near the Ash Pond Complex is indicative of ongoing or intermittent and recurring leaks that occurred during the CWA statute of limitations and are expected to continue in the future.

2. Diligent Prosecution Bar/'Seeps Alone'

432. As discussed *supra*, none of the evidence at trial justified expanding upon the Court's earlier ruling dismissing some, but not all, of Plaintiffs' allegations under the diligent prosecution bar. Accordingly, the fundamental question before the Court now is whether the allegations on which Plaintiffs rely fall within the narrow class of claims that survived its earlier Order, or whether they instead fall solely within the allegations already dismissed.

433. The Court defined the Ash Pond Complex claims that survived its Order as those arising out of "discharges from the Ash Pond Complex via hydrologic flows that are not seeps alone." (Doc. No. 140 at 1.) Plaintiffs therefore must demonstrate that the discharges on which they rely are not "seeps alone." The Court's use of the qualifier "alone" reflects an acknowledgment that geological complexity may cause some leaks, on their path to the river, to include both seepage and non-seepage flow. For example, a theoretical leak might involve water seeping first through a thin layer of soil cover, then reaching and passing through a fissure in rock. Conversely, water might first escape from the pond by way of a karst conduit, but then travel the final

few feet to the river by way of slow-pore seepage through soil. The Court's Order of September 9, 2016, dismissed only claims based on seeps *alone*.

434. Because the ten seeps expressly identified in Tennessee's state court complaint are unambiguously part of the State Enforcement Action, those seeps cannot form the basis of liability here.[6] The Court ***838** acknowledges, however, that the nature of flowing water is that segregating pollutants that discharged through one particular source—such as a State Enforcement Action seep—from pollutants that discharged through a separate, nearby source may be difficult or even impossible.

435. Accordingly, it is possible that some sampling locations may include both pollutants attributable to a State Enforcement Action seep and pollutants attributable to other leaks. The mere presence of some contamination relevant to the State Enforcement Action does not necessarily render the

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[6] TVA points out that some additional leaks, including two on the east side of Odom's Bend Peninsula, were mentioned by Plaintiffs in their Complaint in Intervention in the State Enforcement Action. (J. Ex. 152 at ex. 1.) TVA urges the Court to treat those leaks in the same manner as it treats the ten seeps named in the State's Complaint. The Court, however, does not construe the Complaint in Intervention as sufficient to expand the scope of what the Court held the State to have been diligently prosecuting at the time the Complaint in this case was filed. In any event, even if the Court did treat those additional seeps in the same manner as it is treating the ten State-identified seeps, it would not affect the Court's ultimate factual and legal conclusions *infra*. At most, the relevant portions of the Court's analysis of the alleged east side leaks would more closely echo its analysis of the west side leaks.

pollution identified at a particular site irrelevant—as long as there is evidence to suggest an additional source that is not part of the State Enforcement Action.

436. The evidence presented suggests that, in a body of water the size of the Cumberland River, pollutants become attenuated even a short distance from the initial leak. (See Doc. No. 235 (Tr. Day 2) at 163.) That fact is confirmed by, for example, comparing Vengosh's GT–2 sample with his GT–3 and GT–4 samples. GT–3 and GT–4 show boron concentrations indicative of significant coal ash contamination, but GT–2 is essentially pristine—despite being downstream from that contamination. (Doc. No. 228–1 (Vengosh Wr. Test.) at ¶¶ 45–53.)

437. Accordingly, The Court concludes that it is generally reasonable to infer that a sample showing a high concentration of a pollutant is indicative of an immediately upstream or adjacent discharge.

438. If sampling locations can give the Court an idea of where leaks occurred, however, they provide little help in determining what type of leak was involved. For this question, the Court must look to what it knows about the Ash Pond Complex itself and the underlying terrain.

439. The Court's conclusions about the nature of the Ash Pond Complex discharges, then, are based on an analysis of two sets of information: (1) evidence about the features of the Complex itself and the surrounding terrain that would tend to predict or describe the types of leaks expected to arise; and (2)

the location and content of tested samples.

a. Features of the Ash Pond Complex

440. At the time of trial, the process of completing the EIP that arose out of the State Enforcement Action was ongoing. The Court, therefore, was unable to benefit from the more detailed study of the area's hydrology and geology that the EIP process is apparently intended to yield. Nevertheless, the parties did present a wealth of contemporaneous and historical assessments of the Complex and the surrounding terrain that were relevant to the question of whether the ongoing leaks are likely to involve conduit flows or merely seepage alone.

441. TVA's assessments of the Complex made in connection with this litigation tended to play up the continued uncertainty about the area's geological properties. Its pre-litigation pronouncements, however, tell a somewhat less uncertain story. ***839** Even decades ago, TVA was candid and unambiguous in its understanding of the extensive karst activity immediately below the Ash Pond Complex and its understanding that isolated repairs could not be expected to simply render those karst conditions a thing of the past. It was TVA itself that wrote, in 1977, that "the network of solution cavities and crevices in the groundwater system under the pond is extensive." (J. Ex. 41 at TVGF_008092.) It was TVA that admitted, in the same document, that "plugging the presently leaking sinkholes would give no assurance that other sink holes would not begin to leak." (Id.)

442. As TVA has pointed out, Plaintiffs have nevertheless been unable to identify specific sinkholes or other leaking karst features in the Ash Pond Complex in the present day. That failure to identify specific leaks within the ponds, however, has a simple explanation: as Plaintiffs' experts explained, any such features are currently obscured by a thick layer of coal ash. Although it would make the Court's job easier to have concrete evidence of karst-related drainage features or concrete evidence of their absence, the realities of the site call for a more searching review, based on what we can and do know.

443. The parties agree—and indeed it appears to be beyond dispute—that the Ash Pond Complex was built upon terrain riddled with potential karst-related leaks, and that those leaks did in fact result in substantial discharge of pollution into the Cumberland River. While there may be some question about the historical records, it appears at least likely that some of this leaking was tied to the geographic feature known as Sinking Creek.

444. Contemporary TVA documentation from the time of the Ash Pond Complex's extensive repairs, in particular the 1977 Leakage Memorandum, leaves substantial reason to doubt that TVA ever wholly cataloged and definitively repaired all of the potential leaks present at the time. Plaintiffs have convincingly demonstrated that—as common sense would confirm—the simple fact that the Complex became capable of holding some water does not show that it was wholly repaired, but only that it was at least leaking more slowly than it was receiving fresh

waste.

445. Despite the history of extensive leakage in the Complex, TVA has insisted that there is a lack of affirmative evidence demonstrating specific *current* leaks through karst features. But if one had asked the TVA of 1972 or 1976, it likely would have said the same thing, according to its own inspections—despite the fact that its ponds were in the process of losing over twenty-five billion gallons of sluice water through precisely such features. (See Doc. No. 237 (Tr. Day 4) at 9–10; Doc. No. 229–2 (Kutschke Wr. Test.) at 7.) The lack of detailed contemporaneous awareness of specific leaks is not persuasive evidence of their absence.

446. Just as the historical leaking is undisputed, it is likewise beyond dispute that sinkholes have been recently discovered in the areas of the Gallatin Plant site that were not obscured by a vision-blocking layer of thick coal ash. TVA's witnesses admit that sinkholes were discovered around the Gallatin Plant in 2010. They admit that sinkholes were known and repaired in the site of the expansion of Ash Pond E in 2005.

447. Perhaps most importantly, the unanimous expert testimony is that sinkholes and other drainage features in karst terrain are not mere relics of some past geologic event. Rather, the physical properties of the terrain itself make such areas prone to the continued development of ever newer sinkholes or other karst features. While Kutschke's testimony suggests that the karst terrain of the Ash ***840** Pond Complex is perhaps less sinkhole-prone

than some other karst landscapes, that testimony falls short of negating the ponds' general proclivity to leak. It matters little whether this karst is less sinkhole-prone *relative to other karst.* What matters, for the purposes of the Court's ruling on the diligent prosecution bar, is whether the Complex's leaks involve non-seepage flows at all.

448. Dotson's observation of an apparent scarp further supports an inference that the Ash Pond Complex continues to suffer from the volatile, leak-prone realities of karst.

449. Boring logs showing substantial apparent voids similarly support the inference that leaks through conduits, fissures, or other open areas are likely.

450. Admittedly, the lack of demonstrable rapid connectivity between the Complex and the River suggests that whatever leaks do exist in the floors of the ponds are limited in size and rate of outflow. Under the strict liability framework of the CWA, however, the threshold question is whether leaks exist, not whether they are large enough to be easily observed by one particular method.

451. Groves' characterization of the Ash Pond Complex as a colander is perhaps overly simplistic—there is no evidence that the ponds contain leaks as extensive and uniform as that metaphor might suggest. But a container with a few holes is just as surely leaking as one with a hundred. It is simply implausible, based on the evidence before the Court, that the Complex has not continued to, and will not

continue to, suffer at least some leaking through karst features.

452. In short, the features of the Ash Pond Complex strongly suggest that it has continued to, and will continue to, leak through karst features that cannot be characterized as "seeps alone."

b. Sampling

453. The sampling locations suggesting that the Ash Pond Complex may be leaking can be classified into two groups: (1) locations on the east side of Odom's Bend Peninsula; and (2) locations tightly grouped on the portion of the west side of Odom's Bend Peninsula that also includes Seeps 4 and 5 from the State Enforcement Action.

454. The evidence of leaking near the east side locations is mixed. Quarles and Sulkin's sampling showed contaminants suggestive of leaks at East Side 1 and East Side 2. (Doc. No. 227–2 (Quarles Wr. Test.) at ¶ 58; Pl. Ex. 1.) Samples taken by Vengosh at the same locations, however, suggested that the water was not impacted by coal ash waste. (Doc. No. 228–1 (Vengosh Wr. Test.) at ¶¶ 43, 53.)

455. The different results could be the result of the different methodologies used by the experts or could reflect leaking that was only intermittent. Vengosh himself testified that he would expect contaminant levels to vary greatly depending on situational factors. (Doc. No. 235 (Tr. Day 2) at 163.) His conclusion that the East Side locations happened to be pristine at the time of his sampling, therefore, does not preclude the possibility that intermittent

leaking was nevertheless occurring at other times.

456. The west side sampling is less ambiguous—Vengosh, Sulkin, and Quarles all find evidence of contamination. However, because these sampling sites—APC 1 through 4—were in the general vicinity of Seeps 4 and 5 from the State Enforcement Action, the question arises of whether the contamination detected can be attributed to leaks still cognizable in this case.

457. On close inspection, Plaintiffs' west side sampling locations, though close to Seeps 4 and 5, are nevertheless distinct ***841** sites. APC 4 is seventy-five feet from the shoreline. APC 2 is forty feet. APC 1 is the site of a shoreline sample that appears to be over a hundred feet downstream from the nearest State Enforcement Action seep.

458. It is entirely possible that some contamination from the State Enforcement Action seeps also showed up in these samples. The question before the Court, however, is whether the preponderance of the evidence suggests that the State Enforcement Action seeps can account for the entirety of that contamination.

459. TVA's attempt to attribute all of the pollution to the seeps is belied somewhat by its own insistence that the seeps are minor or even, in many cases, inert. AECOM identified a number of seeps, but TVA's 2016 seep inspection report indicated that all of those seeps are currently "non-flowing" and that most of them are no longer active at all. (Doc. No. 229–1 (Lang Wr. Test.) at 9; J. Ex. 157 at

TVGF_100719–29, –45.) EPA contractor Dewberry's 2013 Dam Assessment Report had similarly characterized the Ash Pond Complex's seeps as "minor and adequately monitored." (J. Ex. 126 at 7–11.)

460. Throughout this litigation, TVA has vehemently insisted that the Ash Pond Complex seeps have leaked no more than anticipated during the 2012 permit renewal process. TDEC, though, anticipated only seeps so minor that they would be difficult to quantify or measure empirically. (J. Ex. 102 at PageID 105.) The Court is therefore skeptical that these ostensibly de minimis seeps could also be solely responsible for the incriminating pollutant concentrations to be found a meaningful, if admittedly not great, distance away. The Ash Pond Complex seeps are either de minimis or they are not; TVA cannot convincingly argue that the seeps discharge however much or however little is convenient for the particular defense at hand.

461. Ultimately, the west side sampling, at least as it has been presented to the Court, is consistent with either of two mutually exclusive explanations: (1) that it merely reflects contamination from State Enforcement Action seeps and wholly past leakage; or (2) that it consists, in whole or some part, of contamination from additional leaks, including leaks through the floor of the ponds and including non-seepage flows.

462. Given the inconclusive nature of the sampling, the evidence of the pond's leak-prone construction and history carries the day. While the

contamination demonstrated in the Cumberland River may come from multiple sources, it is implausible to suggest that none of the contamination came from a non-seepage flow. The Court therefore concludes, by a preponderance of the evidence, that at least some portion of the unambiguous contamination of the Cumberland River near the Ash Pond Complex is caused by leaks that are not seeps alone. Accordingly, Plaintiffs have demonstrated leaks that fall within the boundaries of the claims not dismissed by the Court's September 9, 2016 Order.

3. Connection to the Waters of the United States

463. As the Court has explained, Plaintiffs must show that the pollutants at issue migrated along a generally traceable, direct connection to the waters of the United States, but they need not be able to set forth every twist or turn on the water's path. Plaintiffs have satisfied this burden.

464. The purpose of requiring a direct, traceable connection between contaminated groundwater and the waters of the United States is to weed out claims that improperly rely on "a generalized assertion that covered surface waters will eventually be affected by remote, gradual, natural ***842** seepage from the contaminated groundwater." Rice, 250 F.3d at 272.

465. The leaks here, though, are anything but remote in their connection to the Cumberland River. The Ash Pond Complex is situated directly next to the shores of that river, arguably even on top of one of its former tributaries. While the fractured nature

of karst terrain may mean that some groundwater takes a few unexpected detours on its way to the Cumberland, the water's general path is simple, clear, and direct. The fact that the demonstrated discharges to the River involve a short trip through the groundwater first is in no way fatal to Plaintiffs' claims.

4. Permit Shield Doctrine

466. Nothing in the text of the Gallatin Plant's NPDES permit expressly authorizes the continuing discharge of pollutants from leaks in the Ash Pond Complex. Accordingly, Plaintiffs have satisfied their initial burden of demonstrating that the discharges were not authorized. TVA argues that it is nevertheless entitled to protection under the permit shield provision, because those discharges were within TDEC's reasonable contemplation when the permit was issued. As the Court has held *supra*, TVA's argument amounts to an affirmative defense on which it bears the burden of persuasion. It has not met that burden.

467. At most, TVA has demonstrated that, when TDEC issued the NPDES permit for the Gallatin Plant, TDEC was aware that the unlined ponds would continue to experience some ongoing seepage through its dikes. Any claims based purely on minor dike seepage, however, were already dismissed from this case pursuant to the diligent prosecution bar. TVA has not carried its burden of establishing that leaks of the types demonstrated by Plaintiffs were considered by TDEC to be within the scope of what was considered and authorized under the permit.

5. Conclusion

468. In summary, Plaintiffs have established that TVA has discharged and is reasonably likely to continue discharging pollutants from a point source, the Ash Pond Complex, into the Cumberland River in violation of the CWA and the terms of its NPDES permit. They have further demonstrated that those discharges do not consist solely of slow-pore seepage of contaminants and therefore may give rise to relief in this Court. TVA has failed to carry its burden of establishing that the discharges were reasonably contemplated by TDEC as part of the Gallatin Plant NPDES permit. Plaintiffs have therefore established liability under the citizen suit provision of the CWA.

C. Specific Permit Violations

1. Part I.A(c)

469. Part I.A(c), known as a "removed substances" provision, provides that "material removed by any treatment works must be disposed of in a manner ... which prevents its entrance into or pollution of any surface or subsurface waters." (J. Ex. 102 at 11.) "[T]he removed substances provision aims to ensure the integrity of wastewater treatment and control systems." Yadkin, 141 F.Supp.3d at 446.

470. Plaintiffs' demonstration of unauthorized discharges from the Ash Pond Complex also resolves their allegation under this provision. As the sluiced waste water undergoes a settling process, ash is removed from the water. Some of that ash simply remains on the bottom of the pond. Other ash is removed by TVA and reused. Some ash waste,

though, escapes to the Cumberland River, creating a violation of the facial terms of Part I.A(c).

***843** 471. Plaintiffs are therefore entitled to judgment on Claim E.b.

2. Part II.A(4.a)

472. Part II.A(4.a) requires TVA to "properly operate and maintain all facilities and systems (and related appurtenances) for collection and treatment which are installed or used by the permittee to achieve compliance with the terms and conditions of the permit." (J. Ex. 102 at 19.) Plaintiffs argue that the ongoing leaking of the Ash Pond Complex establishes that the Complex was not properly operated and maintained.

473. Plaintiffs' arguments, however, are in tension with their own proof, which establishes that the leak-prone nature of the Complex is a likely inevitable feature of its siting and design. Indeed, the record before the Court would seem to strongly suggest that there may, in fact, be no way to operate and maintain a wholly unlined coal ash pond in the relevant terrain without giving rise to leaks. Because Part II.A(4.a) expressly concerns itself with operation and maintenance—rather than siting, design, or construction—the Court construes the provision to refer to failures in the day-to-day operation and care of the Complex. TVA's failures in this case, however, were not related to day-to-day operation and care, but to deep systemic flaws in its coal ash waste treatment system.

474. Accordingly, the Court will enter judgment

in TVA's favor on Claim E.c.

3. Part II.C(2)

475. Part II.C(2) requires TVA to give notice to TDEC within twenty-four hours of "any noncompliance which could cause a threat to public drinking supplies, or any other discharge which could constitute a threat to human health or the environment." (J. Ex. 102 at 22.) Because this obligation imposes a time-sensitive requirement, Plaintiffs cannot succeed on this claim without identifying a particular qualifying instance of noncompliance with a time certain. They have failed to do so. While Plaintiffs have demonstrated that the Ash Pond Complex likely leaked continuously or intermittently throughout the period within the state of limitations in this case, they have not identified a particular triggering event creating a threat to human health or the environment that would give rise to an obligation under this provision.

476. Accordingly, the Court will enter judgment in TVA's favor on Claim E.d.

4. Part II.C(3.b)

477. Part II.C(3.b) forbids "the discharge to land or water of wastes from any portion of the collection, transmission, or treatment system other than through permitted outfalls." (Id.) As with Part I.A(c), this allegation is resolved by Plaintiffs' demonstration that TVA improperly discharged coal ash waste through leaks to the Ash Pond Complex. The only permitted outfall for such discharges under the permit was Outfall 001, and therefore any

additional leaks, by definition, violated this provision.

478. Plaintiffs are therefore entitled to judgment on Claim E.e.

VI. FINDINGS OF FACT & CONCLUSIONS OF LAW–REMEDIES

479. A party that is held to have committed ongoing violations of the CWA may be subject to both civil penalties and injunctive relief. "Under [the citizen suit provision of the CWA], the district court has discretion to determine which form of relief is best suited, in the particular case, to abate current violations and deter future ones." Laidlaw, 528 U.S. at 192, 120 S.Ct. 693. A court is not automatically required to issue injunctive relief ***844** merely because the plaintiff has demonstrated a violation of the law and a risk of future violations. Id. Rather, injunctive relief under the CWA remains "an equitable remedy" that must be fashioned to the circumstances of the case. Weinberger v. Romero–Barcelo, 456 U.S. 305, 311, 102 S.Ct. 1798, 72 L.Ed.2d 91 (1982).

A. Penalties

480. "The Court has discretion whether to impose civil penalties in a citizen suit under the CWA." Va. Elec. & Power Co., 247 F.Supp.3d at 764, 2017 WL 1095039, at *8 (citing Gwaltney of Smithfield, Ltd. v. Chesapeake Bay Found., Inc., 484 U.S. 49, 52–53 n.1, 108 S.Ct. 376, 98 L.Ed.2d 306 (1987)). "In determining the amount of a civil penalty the court

shall consider the seriousness of the violation or violations, the economic benefit (if any) resulting from the violation, any history of such violations, any good-faith efforts to comply with the applicable requirements, the economic impact of the penalty on the violator, and such other matters as justice may require." 33 U.S.C. § 1319(d).

481. Plaintiffs have demonstrated that TVA has unlawfully discharged pollutants into the Cumberland River, and that those pollutants carry with them particular risks. But the evidence is scant of concrete harm beyond mere risk and the presence of pollutants in and of itself.

482. Moreover, Plaintiffs' own experts characterize their sampling strategy as designed to identify the existence of leaks and not calculated to establish their extent or severity. The record is therefore largely bereft of evidence that would lead the Court to conclude that TVA's violations are particularly severe, in terms of the harm done or the amount of pollutants released.

483. Accordingly, the severity of TVA's violations ultimately counsels against an award of penalties.

484. Also weighing against the imposition of penalties is the fact that TVA has already incurred, and is likely to continue to incur, very substantial costs in remediating the risks from the Ash Pond Complex and Non–Registered Site. TVA may have benefitted some from putting off remedial action as long as it has, but that delay is coming to an end, at considerable expense. The Court perceives no need

for additional penalties on top of those costs.

485. The strongest factor favoring penalties is the long-running nature of TVA's violations. But that factor is mitigated somewhat by the fact that, for much if not all of the period within the statute of limitations, TVA appears to have been at least working towards resolving some or all of its ash pond problems, often with direct involvement of TDEC itself.

486. While TVA has not demonstrated that it is excused from liability by the permit shield doctrine, there is undeniable equitable weight to the fact that TVA likely reasonably believed itself to be working with the agency charged with regulating its discharges. Every indication is that TVA perceived itself as participating in a long-running, collaborative process of addressing its ash waste disposal issues with TDEC.

487. Accordingly, the Court will not assess penalties against TVA under the CWA.

B. Injunctive Relief

488. Generally speaking, a plaintiff seeking permanent injunctive relief "must demonstrate: (1) that it has suffered an irreparable injury; (2) that remedies available at law, such as monetary damages, are inadequate to compensate for that injury; (3) that, considering the balance of hardships between the plaintiff and defendant, a remedy in equity is warranted; and (4) that the public interest would not be disserved ***845** by a permanent injunction." eBay Inc. v. MercExchange, L.L.C., 547

U.S. 388, 391, 126 S.Ct. 1837, 164 L.Ed.2d 641 (2006). "The grant of jurisdiction to ensure compliance with a statute hardly suggests an absolute duty to do so under any and all circumstances, and a federal judge sitting as chancellor is not mechanically obligated to grant an injunction for every violation of law." Weinberger, 456 U.S. at 312, 102 S.Ct. 1798 (citing TVA v. Hill, 437 U.S. 153, 193, 98 S.Ct. 2279, 57 L.Ed.2d 117 (1978)). "An injunction should issue only where the intervention of a court of equity 'is essential in order effectually to protect ... against injuries otherwise irremediable.' " Id. (quoting Cavanaugh v. Looney, 248 U.S. 453, 456, 39 S.Ct. 142, 63 L.Ed. 354 (1919)).

489. Plaintiffs have easily cleared the initial hurdle of demonstrating that injunctive relief is necessary. The injury here is the unlawful contamination of the river. The strict liability regime adopted by Congress makes clear that unauthorized contamination itself is a harm warranting remediation. The only adequate remedy is one that addresses and mitigates that unlawful contamination. Such a remedy would moreover plainly be in the public interest, and it is only appropriate that TVA—which is already going to bear responsibility for closing the ash ponds regardless of what happens in this case—shoulder the cost.

490. The question of what sort of injunctive relief is appropriate, however, is considerably more difficult. It is apparent from the record that, at the very least, the Ash Pond Complex should be closed as an ash waste treatment facility and the Non–

Registered Site must, at a minimum, be improved. Some steps in that direction, in fact, appear to be inevitable regardless of what the Court orders. Considerably less clear is whether these bare minimum actions would be adequate to protect the rights of Plaintiffs and all of the other members of the public who, under the Clean Water Act, possess a right to enjoy the many benefits of the Cumberland River free of any unlawful discharges of pollutants.

491. Although the Court has searched in vain for a compromise position, the parties have consistently presented the question of how to proceed with closure as a binary choice between two options: closure in place versus closure by removal—that is, closure by capping the coal ash impoundments where they are versus closure by excavating and placing the coal ash waste in a new, more secure impoundment. In choosing between these options, the Court must not mechanically select the harsher or more lenient choice, but instead exercise "[f]lexibility rather than rigidity" to "mould [its] decree to the necessities of the particular case." Id. (quoting Hecht Co. v. Bowles, 321 U.S. 321, 329, 64 S.Ct. 587, 88 L.Ed. 754 (1944)).

492. Closure in place has the clear benefits of being both faster and less expensive than closure by removal. TVA has also persuasively argued that there are some risks associated with excavation of coal ash on the scale that would be required here. The contamination from the Gallatin Plant has, at least in recent years, apparently been mild compared to what could result from a catastrophic event such as a spill during removal or the accidental triggering

of a larger failure in the pond floor of the Ash Pond Complex. The Court, therefore, does not take the possibility of closure by removal lightly—and, if the Court were convinced that closure in place would be adequate, that is the relief that the Court would order.

493. The evidence before the Court, however, offers no such assurances—and in fact offers ample reason to doubt that closure in place can actually put an end to ***846** the inadvertent discharges that have plagued the Gallatin Plant for the entirety of its existence.

494. For example, it is apparent to the Court that a key issue regarding the efficacy of closure in place is whether, and to what extent, the coal ash waste at the Gallatin Plant penetrates the water table. The testimony on this issue at trial was uncertain and at times contradictory, but, on balance, it does appear more likely than not that some portions of the ponds penetrate the water table. The extent and depth of that penetration, however, remains unclear. Accordingly, giving the Court's blessing to closure in place at this juncture would amount to nothing less than rolling the dice and hoping that reality bears out TVA's understandably self-interested contention that closure in place will be adequate. Closure by removal, in contrast, would resolve the risk of leaking regardless of the impoundments' relationship to the water table.

495. If closure in place did prove inadequate, the likely, if not inevitable, result would be yet more litigation—and, of course, decade after decade of the

public simply having to hope that whatever unplanned, incidental leakage that was coming from the impoundments was not enough to do them significant harm.

496. The history of the Non–Registered Site offers a grim preview of what it means to leave an abandoned unlined coal ash waste pond in place next to a river. The Non–Registered Site has not been a waste treatment facility for over forty-five years. It has been "closed" for almost twenty. Still, water infiltrates it. Still, it leaks pollutants. Still, counsel for TVA and counsel for environmental groups are locked in conflict about what can and should be done about it. The Non–Registered Site, moreover, is not even located in karst terrain—meaning that the risks associated with the Ash Pond Complex will likely be even greater. As long as the ash remains where it is in either site, there is every reason to think that the dangers, uncertainties, and conflicts giving rise to this case will survive another twenty years, forty-five years, or more. While the process of closure by removal would not be swift, it would, at least, end.

497. In its search for possible remedies in this case, the Court considered a third possibility: allowing TVA to choose closure in place if it also took certain specific steps to work with TDEC to bring its treatment of the leaks into compliance with the law. The specter that has haunted every aspect of this case is that, while the Gallatin Plant's NPDES permit and accompanying materials deal passingly with the issue of seeps, they adopt no stringent, unambiguous, and comprehensive framework for addressing those seeps or any other leaks under the

permit. The Court wondered if one way to prevent future unlawful leaks might be not to wholly stops the leaks—but to bring those leaks within the boundaries of what is lawful.

498. TVA's recent permit renewal activities, however, demonstrate the ultimate unworkability of this method. According to publicly available permit application documents,[7] TVA recently requested terms that would expressly acknowledge that the permit anticipates some coal ash waste seeps from the Gallatin Plant. Letter from Chuck Head to Terrence E. Cheek 2 (May ***847** 15, 2017) (available at http://environment–online.tn.gov:8080/pls/enf_reports/f?p=9034:34051:::NO:34051:P34051_PERMIT_NUMBER:TN0005428). TDEC rejected the proposal, explaining why it could not grant a blanket authorization of future seeps:

> When wastewater or partially treated wastewater continually flows through a seep, the seep may become a new point source discharge. However, the seep is not identified in the NPDES permit as a point source discharge, the rate of discharge from the seep is unknown, the chemical, biological and physical characteristics of the seep are

[7] Federal Rule of Evidence 201(b) permits the Court to take judicial notice of a fact that "(1) is generally known within the trial court's territorial jurisdiction" or "(2) can be accurately and readily determined from sources whose accuracy cannot reasonably be questioned." "[G]overnment documents available from reliable sources on the Internet" are generally appropriate for judicial notice. U.S. ex rel. Dingle v. BioPort Corp., 270 F.Supp.2d 968, 972 (W.D. Mich. 2003).

> unknown, and the seep may discharge to the nearest surface water.
>
> The discharge of wastewater or partially treated wastewater through a seep in a dike is not authorized in existing NPDES permits.

Id. at 2-3. In other words, the NPDES system, at least as understood by TDEC, simply does not envision the kind of blanket indulgences that TVA would need in order to boast a regulatory blessing of its preferred status quo. The Court sees no reason to think that this logic would apply any differently to leaks that are not purely seeps.

499. This most recent correspondence between TDEC and TVA suggests that the lack of an adequate, unambiguous NPDES permit framework for addressing leaks is not simply an oversight that can be rectified—but rather, that TVA's insistence that its ponds be allowed to continue leaking cannot be reconciled with the Gallatin Plant's obligations under the CWA or NPDES. Any hope for a purely regulatory solution to the dilemmas facing the Court, therefore, was illusory.

500. Ultimately, then, the Court is confronted with two possible futures, each unpalatable in its own way. In one future, TVA closes the ponds in place and all of the uncertainty that has characterized the first sixty years of the Gallatin Plant's operation continues, in modified form, in perpetuity. In the other future, TVA expends significantly more money and effort, but the coal ash waste is finally removed to an impoundment that is not plagued by the intractable flaws of its ponds'

current design. Faced with these two unappealing options, the Court is impelled to select the one that actually reliably promises to put an end to this saga.

501. Accordingly, the Court will order TVA to fully excavate the coal ash waste currently located in the Ash Pond Complex and Non–Registered Site and move the waste to a lined site that offers reasonable assurances that it will not discharge waste into the waters of the United States. The Court understands that the technical challenges of such a process are significant and that finalizing a plan for closure may take a great deal of time. Accordingly, the Court will order TVA to file a report one month from the entry of the Court's order providing a timeline and itemized description of the process for complying with the Court's Order, and TVA will be required to file periodic updates thereafter.

502. The Court is fully cognizant of the costs its chosen remedy will impose on TVA and has taken those costs into consideration when deciding, in its discretion, not to assess penalties in this matter.

503. While the burden of closure by removal may be great, it is the only adequate resolution to an untenable situation that has gone on for far too long. From the Court's privileged vantage point in 2017, and based on all of the evidence presented at trial, it is difficult to imagine why anyone would choose to build an unlined ash waste pond in karst terrain immediately adjacent to a river. The Court, however, understands that it is now the beneficiary of technical knowledge and environmental ***848** concerns that may not have informed the decision-

making of half a century ago. The futility of second-guessing such decades-old actions is one reason the CWA has a statute of limitations. Nevertheless, while the decision to build the Ash Pond Complex is in the past, the consequences of that decision continue today, and it now falls on the Court to address them. The way to do so is not to cover over those decades-old mistakes, but to pull them up by their roots. TVA, as the entity responsible for the ponds, must be the entity to do so.

VII. CONCLUSION

For the foregoing reasons, the Court will direct the Clerk to enter judgment for the Plaintiffs on Claims A, C, D, E.b, and E.e. It will direct the Clerk to enter judgment for TVA on Claims B, E.a, E.c and E.d. TVA will be ordered to excavate the coal ash waste impounded at the Gallatin Plant and remove it to an appropriate lined site that does not pose a substantial risk of discharges into the waters of the United States. In light of the substantial costs TVA is likely to incur in remediating its ash pond disposal areas, the Court declines to assess penalties on top of its injunctive relief.

The court will issue an appropriate Order.

s/ WAVERLY D. CRENSHAW, JR.
CHIEF UNITED STATES DISTRICT JUDGE

UNITED STATES DISTRICT COURT
MIDDLE DISTRICT OF TENNESSEE
NASHVILLE DIVISION

TENNESSEE CLEAN WATER NETWORK; TENNESSEE SCENIC RIVERS ASSOCIATION, **Plaintiffs,** **v.** **TENNESSEE VALLEY AUTHORITY,** **Defendant.**	**No. 3:15-CV-00424** **CHIEF JUDGE CRENSHAW**

ORDER

For reasons in the accompanying Memorandum Opinion, TVA's Motion to Dismiss for Failure to State a Claim (Doc. No. 12) is **GRANTED** in part and **DENIED** in part; TVA's Motion to Dismiss Plaintiffs' Claim for Civil Penalties and Jury Demand (Doc. No. 28) is **DENIED** as to civil penalties and **GRANTED** as to Plaintiffs' jury demand, and the Court hereby **STRIKES** Plaintiffs' demand for a jury; TVA's Motion for Judgment on the Pleadings as to All Plaintiffs Claims Regarding Seeps (Doc. No. 51) is **DENIED**; TVA's Motion for Summary Judgment on Plaintiffs' Claim B (Doc. No. 57) is **DENIED AS MOOT**; TVA's Motion for Judgment on the Pleadings as to Plaintiffs' Claim E (Doc. No. 102) is **GRANTED** as to Claim E.a and

DENIED as to all other claims; Plaintiffs' Motion for Partial Summary Judgment (Doc. No. 106) is **DENIED**; and TVA's Request for Judicial Notice (Doc. No. 136) is **GRANTED**. Plaintiffs Claims B and E.a are **DISMISSED**. Claims A, C, D, E.b, E.c, E.d, and E.e are **DISMISSED** except insofar as they deal with one or both of the following: discharges from the Non-Registered Site into the Cumberland River; and discharges from the Ash Pond Complex via hydrologic flows that are not seeps alone.

The case is SET for a status conference on October 19, 2016 at 10:30 a.m. in Courtroom A859.

IT IS SO ORDERED.

s/ WAVERLY D. CRENSHAW, JR.
CHIEF UNITED STATES DISTRICT JUDGE

UNITED STATES DISTRICT COURT
MIDDLE DISTRICT OF TENNESSEE
NASHVILLE DIVISION

TENNESSEE CLEAN WATER NETWORK; TENNESSEE SCENIC RIVERS ASSOCIATION, **Plaintiffs,** **v.** **TENNESSEE VALLEY AUTHORITY,** **Defendant.**	**No. 3:15-CV-00424** **CHIEF JUDGE CRENSHAW**

MEMORANDUM OPINION

WAVERLY D. CRENSHAW, JR., UNITED STATES DISTRICT JUDGE

The Tennessee Clean Water Network and Tennessee Scenic Rivers Association ("Plaintiffs") have filed a Complaint *1284 against the Tennessee Valley Authority ("TVA") alleging numerous violations of the Clean Water Act ("CWA") related to TVA's operation of a coal-fired power plant about five miles south of the city of Gallatin, Tennessee ("Gallatin Plant"). (Doc. No. 1.) TVA has filed a Motion to Dismiss for Failure to State a Claim (Doc. No. 12), a Motion to Dismiss Plaintiffs' Claim for Civil Penalties and Plaintiffs' Jury Demand (Doc. No. 28), a Motion for Judgment on the Pleadings as to All

Plaintiffs' Claims Regarding Seeps (Doc No. 51), a Motion for Summary Judgment on Plaintiffs' Claim B (Doc. No. 57), and a Motion for Judgment on the Pleadings as to Plaintiffs' Claim E (Doc. No. 102). Plaintiffs have filed a Motion for Partial Summary Judgment. (Doc. No. 106.) TVA has also filed a Request for Judicial Notice regarding two exhibits. (Doc. No. 136.)

I. BACKGROUND

Plaintiffs are two Tennessee conservation organizations claiming individual members who variously use, paddle, fish in, enjoy, and otherwise live, work, and recreate on the portion of the Cumberland River in the vicinity of and downstream from the Gallatin Plant. (Doc. No. 1 at ¶¶ 22, 29, 31.) TVA is a corporate agency and instrumentality of the United States created by the Tennessee Valley Authority Act of 1933, see 16 U.S.C. § 831–831ee, that operates electricity-generating facilities including the Gallatin Plant. (Id. at ¶ 2.)

A. The Gallatin Plant & Ash Ponds

The Gallatin Plant is a four-unit, coal-fired power plant on Odom's Bend Peninsula, adjacent to the portion of the Cumberland River known as Old Hickory Lake. (Doc. No. 87 at ¶ 1.) Old Hickory Lake is a reservoir created by the construction of the Old Hickory Lock and Dam downstream from the location of the Gallatin Plant. (Doc. No. 125 at ¶¶ 2–3.) Both the Lock and Dam and the Plant were constructed during the 1950s, through cooperation between TVA and the Army Corps of Engineers. (Doc. No. 87 at ¶¶ 11–14.) The Gallatin Plant now burns approximately four million tons of coal each year, generating both wanted electricity and

unwanted waste byproducts, in particular coal ash. The Plant can create as much as 235,000 tons of coal ash annually. (Doc. No. 1 at ¶ 49; Doc. No. 14 at ¶ 49.) The Plant removes its coal ash by mixing the ash with water and sluicing it to a series of unlined coal ash ponds that are separated from the Cumberland River by "earthen dikes." (Doc. No. 14 at ¶¶ 49–50.)

Until around 1970, the Plant used a series of ash ponds now known as Non-Registered Site #83-1324 ("Non-Registered Site"). Around 1970, when the Non-Registered Site reached capacity, the Plant stopped using the site for coal ash disposal, but the pond area—which, TVA admitted in its Answer, measures approximately 73 acres—still contains an unknown amount of coal ash. (Id. at ¶¶ 79–81.) In or around 1997, the Tennessee Department of Environment & Conservation ("TDEC") asked TVA to formulate a closure plan for the Non-Registered Site, which it did. As part of the closure plan, TVA began monitoring the area's groundwater for coal ash contamination in 2000. (Id. at ¶¶ 82–83.)

TVA now sluices its ash-water mixture to a different series of ponds ("Ash Pond Complex"). (Doc. No. 125 at ¶ 35.) Plaintiffs have identified the Ash Pond Complex as consisting of five ponds: Ash Pond A; Ash Pond E; and Stilling Ponds B, C, and D. (Doc. No. 134 at SOF 36.) Coal ash waste begins its passage through the complex in either Ash Pond A or E, where some ash is allowed to settle before the water is sent to the stilling ponds. In the ***1285** stilling ponds, more ash is allowed to settle, before the water is finally discharged into the Cumberland River. (Doc. No. 1 at ¶¶ 55–56; Doc. No. 14 at ¶¶ 55–56.) In its Answer, TVA admits that, while the amount of coal ash produced by the Gallatin Plant

varies from year to year, it annually sluices about 230,000 tons of ash into Ash Pond A. (Doc. No. 1 at ¶ 101; Doc. No. 14 at ¶ 101.) Wastewater then passes from Ash Pond A to Stilling Pond B, from there to Stilling Pond C, and from there to Stilling Pond D. (Doc. No. 125 at ¶¶ 39–41). Stilling Pond D discharges effluent into the Cumberland River at a site known as Outfall 001. (Doc. No. 125 at ¶ 41). Although TVA no longer sluices ash into Ash Pond E, that pond continues to contain what Plaintiffs allege to be roughly five million cubic yards of coal ash. (Doc. No. 1 at ¶ 103; Doc. No. 14 at ¶ 103; Doc. No. 125 at ¶ 38.) Wastewater passes from Ash Pond E to Stilling Pond C, and from there to Stilling Pond D, where it joins the water being discharged into the river at Outfall 001. (Doc. No. 125 at ¶¶ 39–41).

Somewhat complicating matters, Plaintiffs dispute that the Ash Pond Complex is merely a manmade wastewater treatment system that discharges into the Cumberland River. Rather, citing United States Geological Survey maps that pre-date the creation of the Ash Pond Complex, Plaintiffs allege that a portion of the area on which the ponds were built had been covered by a stream known as "Sinking Creek" that connected to the river. (Doc. No. 1 at ¶ 107.) Sinking Creek, Plaintiffs argue, was and continues to be a water of the United States.[1] Under

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[1] Congress has defined the jurisdiction of the CWA as reaching all "waters of the United States, including the territorial seas." 33 U.S.C.A. § 1362. Federal rules have defined "waters of the United States" to "encompass not only traditional navigable waters of the kind susceptible to use in interstate commerce, but also tributaries of traditional navigable waters and wetlands adjacent to covered waters." United States v. Cundiff, 555 F.3d 200, 206 (6th Cir. 2009)

such a reading, at least portions of the Ash Pond Complex, in particular Ash Ponds A and E, would themselves be waters of the United States, because they are inseparable from Sinking Creek itself. (Id. at 164–166.)

B. The Gallatin Plant's NPDES Permit

The CWA "anticipates a partnership between the States and the Federal Government, animated by a shared objective: 'to restore and maintain the chemical, physical, and biological integrity of the Nation's waters.' " Arkansas v. Oklahoma, 503 U.S. 91, 101, 112 S.Ct. 1046, 117 L.Ed.2d 239 (1992) (quoting 33 U.S.C. § 1251(a)). The bedrock of the CWA is "a default regime of strict liability," whereby the discharge of any covered pollutant into the Nation's waters amounts to a violation of the statute unless subject to a specific exception. Sierra Club v. ICG Hazard, LLC, 781 F.3d 281, 284 (6th Cir. 2015) (quoting Piney Run Preservation Ass'n v. Cty. Comm'rs of Carroll Cty., 268 F.3d 255, 268–69 (4th Cir. 2001)). The chief means for qualifying for an exception to the CWA's strict liability regime is compliance with a permit issued under the National Pollutant Discharge Elimination System ("NPDES"). Id. "Generally speaking, the NPDES requires dischargers to obtain permits that place limits on the type and quantity of pollutants that can be released into the Nation's waters." S. Fla. Water Mgmt. Dist. v. Miccosukee Tribe of Indians, 541 U.S. 95, 102, 124 S.Ct. 1537, 158 L.Ed.2d 264 (2004). Discharge of pollutants into the waters of the United States without an NPDES permit, or in violation of the terms of an NPDES permit, is ***1286** typically a violation of the CWA. 33 U.S.C. §§ 1311(a), 1342(a), 1365(f)(6).

"The Environmental Protection Agency (["EPA"]) initially administers the NPDES permitting system for each State, but a State may apply for a transfer of permitting authority to state officials." Nat'l Ass'n of Home Builders v. Defs. of Wildlife, 551 U.S. 644, 650, 127 S.Ct. 2518, 168 L.Ed.2d 467 (2007) (citing 33 U.S.C. §§ 1251(b), 1342). In December of 1977, the EPA authorized the State of Tennessee to issue some types of NPDES permits, which the State grants and enforces through TDEC. See 56 Fed. Reg. 21, 376 (1991). In 1986, the EPA expanded that authorization to include the authority to issue and oversee permits for federal facilities such as the Gallatin Plant. 51 Fed. Reg. 32, 834 (1986). The parties agree that the discharge of pollutants from the Gallatin Plant to the Cumberland River is authorized and governed by TDEC-issued NPDES Permit No. TN0005428 ("NPDES Permit"), which TDEC most recently reissued in 2012. (Doc. No. 1 at ¶ 5; Doc. No. 1-2; Doc. No. 15 at ¶ 5.) Plaintiffs allege that the NPDES Permit authorizes the discharge of wastewater pollutants from the ash ponds only through a single point source: Outfall 001. A discharge to the waters of the United States through any other point source, they argue, would be a violation of the CWA. (Doc. No. 1 at ¶¶ 46, 57.)

C. Alleged Unauthorized Discharges

The Gallatin Plant is located in an area with what is known as "karst" topography. Karst topography is "formed over limestone or dolomite, and characterized by sinkholes, caves, and underground drainage." (Doc. No. 1 at ¶ 68; Doc. No. 14 at ¶ 68.) Plaintiffs allege that TVA has long known that the ash ponds' construction and the area's topography would be expected to, and in fact

have, resulted in contamination of the Cumberland River both through direct leaks from the ponds to the river as well as through leaks into groundwater that is hydrologically connected to the river. (Doc. No. 1 at ¶¶ 60–65.) In 1977, for example, TVA prepared a report titled "Magnitude of Ash Disposal Pond Leakage Problem: Gallatin Steam Plant," that Plaintiffs contend identified sinkhole-related leakages so great that the leakage rate was equal to the rate of the inflow of wastewater itself. (Id. at ¶¶ 69–72.) Plaintiffs allege that sinkholes caused illegal discharges in at least 2005 and 2010 as well. (Id. at ¶ 73.)

According to Plaintiffs, TVA's monitoring wells have shown that groundwater in and around the Ash Pond Complex is contaminated by pollutants including aluminum, cobalt, manganese, and sulfate, in concentrations above relevant state and federal standards. (Id. at ¶ 116.) In addition to the groundwater contamination, Plaintiffs contend that TVA has identified and actively monitored numerous "seeps" through which wastewater passed directly from the ponds into the Cumberland River. (Id. at ¶ 117.) "Seep," as Plaintiff uses the term, refers to "slow pore-space seepage of contaminants," as opposed to "conduit flow through fissures and sinkholes that provides rapid connectivity with little to no pollutant attenuation."[2] (Doc. No. 1 ***1287** at ¶

[2] TVA has similarly defined "seeps" as follows: "leachate from landfills or surface impoundments containing combustion residuals" and "composed of liquid ... that has percolated through waste or other materials emplaced in a landfill, or that passes through the surface impoundment's containment structure (e.g., bottom, dikes, berms)." (Doc. No. 52 at 2 n.1 (quoting 42 C.F.R. § 423.11(r) (emphasis added)).) For the

152.) Plaintiffs claim to have documented four additional seeps that TVA had not previously identified, which Plaintiffs have dubbed Seeps A, B, C, and D. (Id. at ¶ 118.) Plaintiffs' allegations tie the seeps directly to TVA's failure to adequately inspect, monitor, and maintain the ponds, and suggest that seeps represent not only unlawful discharges of pollutants but also potential signs that the structural integrity of the ponds might become compromised. (Id. at ¶ 119–24.)

The alleged contamination that Plaintiffs have identified is not limited to the still active Ash Pond Complex. Plaintiffs allege that, by at least 2002, TVA's groundwater monitoring around the no longer active Non-Registered Site revealed beryllium, cadmium, and cobalt in excess of the EPA's maximum contaminant levels ("MCLs") for groundwater protection, and that a 2012 TVA study found that groundwater discharging into the Cumberland River from beneath the Non-Registered Site contained beryllium, cadmium, nickel, and zinc at levels that may pose a risk to aquatic life. (Id. at ¶¶ 84, 90.) Plaintiffs further claim that independent testing at locations on the Cumberland River shore adjacent to the Non-Registered Site in February of 2015 found levels of arsenic, copper, nickel, and zinc in excess of EPA Region 4 (Southeast) screening values. (Id. at ¶ 93.) The Non-Registered Site's alleged discharges into the groundwater render it, in Plaintiffs' words, "essentially a closed, but leaking[,] wastewater facility." (Id. at ¶ 95.)

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purposes of evaluating the pleadings, what is important is that "seeps" is not a catchall term encompassing all leaks, and the Complaint alleges both seeps and leaks that could not be characterized merely as seeps.

D. Plaintiffs' Notice to Regulators

"Although the primary responsibility for enforcement [of the CWA] rests with the state and federal governments, private citizens provide a second level of enforcement and can serve as a check to ensure the state and federal governments are diligent in prosecuting Clean Water Act violations." Sierra Club v. Hamilton Cty. Bd. of Cty. Comm'rs, 504 F.3d 634, 637 (6th Cir. 2007). In furtherance of that role, a citizen may file a suit to enforce the CWA against an alleged polluter if certain procedural requirements are met. 33 U.S.C. § 1365. Before filing suit alleging a CWA violation, the citizen must provide sixty days' notice to the alleged violator, the EPA, and the State in which the alleged violation occurred. 33 U.S.C. § 1365(b)(1)(A). "The 60-day notice provides federal and state governments with the time to initiate their own enforcement actions." Hamilton Cty. Bd. Of Cty. Comm'rs, 504 F.3d at 637. If the United States or relevant state government does commence proceedings, the proposed citizen suit may be blocked by what is known as the "diligent prosecution" bar of 33 U.S.C. § 1365(b)(1)(B). The diligent prosecution bar provides that a citizen may not file suit to enforce a standard, order, or limitation that is already subject to an enforcement action that is being diligently prosecuted, in court, by the EPA or a state. 33 U.S.C. § 1365(b)(1)(B). If the government-initiated suit is in federal court, however, the citizen may still participate by intervening as a matter of right. Id. Whether intervention is possible in a state court action will, of course, depend on state procedural law.

On November 10, 2014, counsel for Plaintiffs sent a Notice of Violation letter to TVA, TDEC, and the

EPA. (Doc. No. 1-3.) The letter informed the recipients that the Plaintiffs had "identified serious and ongoing unpermitted violations of the CWA at the Gallatin Plant," and that the ***1288** Plaintiffs intended to sue TVA if it did not bindingly agree to appropriate remedial steps within sixty days of its receipt of the letter. (Id. at 2.) The letter alleged that both the Ash Pond Complex and Non-Registered Site had resulted in leakage of wastewater and pollutants into the surrounding groundwater and the Cumberland River through a number of leaks in the ponds, including ten TVA-identified seeps. (Id. at 6.) Plaintiffs cited both independent testing and TVA's own testing showing that groundwater in the area contained a number of pollutants in amounts exceeding relevant EPA limits. (Id. at 7–16.)

E. State Enforcement Action

On January 7, 2015, the State of Tennessee filed an original enforcement action against TVA in Davidson County Chancery Court under the Tennessee Solid Waste Disposal Act ("SWDA"), Tenn. Code Ann. §§ 68–211–101 to -124, the Tennessee Water Quality Control Act of 1977 ("TWQCA"), Tenn. Code Ann. §§ 69–3–101 to -137, and regulations promulgated thereunder ("State Enforcement Action"). (Doc. No. 13-5.) The complaint in the State Enforcement Action expressly identifies itself as having been filed "in response to" the Plaintiffs' notice letter. (Id. at 2.) The State's complaint alleges that TVA's groundwater monitoring around the Non-Registered Site suggest that "solid waste has been repeatedly discharged from the [Non-Registered Site] into the groundwater in and around" the Gallatin Plant, giving rise to causes of action under both the SWDA and TWQCA. (Id. at ¶¶ 40, 43, 48.) With

regard to the Ash Pond Complex, the complaint claims that ten seeps identified by the TVA "each constitut[es] a potential unpermitted discharge from the impoundment ponds," in violation of Parts II.A.4.a and II.C.1 of its NPDES permit and the TWQCA. (Id. at ¶¶ 37, 51–53.) The Plaintiffs filed a Motion to Intervene in the State Enforcement Action on February 5, 2015, and the State of Tennessee and TVA stipulated to their intervention pursuant to Tenn. R. Civ. P. 24.01(3). (Doc No. 42-2 at ¶ 10.)

On January 21, 2016, the Davidson County Chancery Court entered an Agreed Temporary Injunction between the State of Tennessee and TVA, requiring TVA to "develop an Environmental Investigation Plan (EIP) for the [Gallatin Plant] and submit it to TDEC within 60 days of the entry of this Order." (Doc. No. 42-2 at 4.) TVA was directed to include in the EIP "a schedule of the work to be performed to fully characterize the hydrology and geology of the [Gallatin Plant] and identify the extent of soil, surface water, and groundwater contamination by CCR [Coal Combustion Residual] material." (Id. at 4.) The court also wrote that "[i]n signing this Agreed Temporary Injunction, the Court does not intend for this agreed order to have an effect on the progression of the pending federal lawsuit" in this Court. (Id. at 7.) Shortly after entering the Agreed Temporary Injunction, the court also directed the parties to provide periodic status updates every seventy-five days. (Doc. No. 77-1 at 2.) The status reports in that matter show that TVA circulated its first proposed EIP in March of 2016, and the parties, including Plaintiffs in their capacity as plaintiff-intervenors, have been meeting and communicating

in efforts to agree upon an appropriate EIP. (Doc. No. 77-2; Doc No. 109-2.)

F. Federal Complaint

Plaintiffs filed their Complaint in this case on April 14, 2015. (Doc. No. 1.) In the Complaint, Plaintiffs allege that the State Enforcement Action omitted a number of alleged CWA violations covered by their 60-day notice letter:

> ***1289** The State Complaint did not include multiple ongoing violations of the Clean Water Act, including: (1) multiple permit violations alleged by the Conservation Groups in the 60-day notice; (2) that TVA is unlawfully discharging pollutants into the surface water of the Cumberland River, as opposed to the groundwater beneath the Gallatin Plant coal ash facility only; and (3) that TVA unlawfully discharged, and continues to unlawfully discharge, coal ash into Sinking Creek, a water of the United States.

(Doc. No. 1 at ¶ 20.) TVA has conceded that the third of these allegations—that TVA unlawfully discharged pollutants into Sinking Creek—was not covered by its State complaint, but disputes the contention that it failed to include any other relevant allegations. (Doc. No. 14 at ¶ 20.)

The federal Complaint pleads five claims, the last of which consists of five separate sub-claims. Claim A asserts that TVA unlawfully discharged pollutants into the waters of the United States through hydrologically connected groundwater discharges. (Doc. No. 1 at ¶¶ 151–161.) Claim B is premised on Plaintiffs' contention that TVA improperly used Sinking Creek, a water of the

United States, as a wastewater treatment facility. (Id. at ¶¶ 162–171.) Claim C alleges CWA violations based on "contamination of the Cumberland River from the [Non-Registered Site]." (Id. at ¶ 173.) Claim D similarly alleges violations based on "contamination of the Cumberland River from the Ash Pond Complex." (Id. at ¶ 178.) Finally, Claims E.a through E.e are based on violations of various provisions of the NPDES permit: Claim E.a is premised on subsection I.A.b; Claim E.b is premised on subsection I.A.c; Claim E.c is premised on subsection II.A.4.a; Claim E.d is premised on subsection II.C.2; and Claim E.e is premised on subsection II.C.3. (Id. at ¶¶ 181–208.)

The parties have continued to litigate this case and the State Enforcement Action, and have filed the various aforementioned motions in this Court. The Court will deal with the motions, as necessary, in turn.

II. MOTIONS TO DISMISS & FOR JUDGMENT ON THE PLEADINGS

TVA has filed four different motions raising various arguments that all or part of the Plaintiffs' claims should be dismissed pursuant to Rule 12(b)(6) or 12(c) of the Federal Rules of Civil Procedure. (Doc. No. 12; Doc. No. 28; Doc. No. 51; Doc. No. 102.) Because the arguments of these motions frequently overlap, the Court will consider them together.

A. Standard of Review

For purposes of a motion to dismiss for failure to state a claim upon which relief can be granted under Rule 12(b)(6), the Court must take all the factual allegations in the complaint as true. Ashcroft v. Iqbal, 556 U.S. 662, 678, 129 S.Ct. 1937, 173 L.Ed.2d

868 (2009). To survive a motion to dismiss, a complaint must contain sufficient factual matter, accepted as true, to state a claim for relief that is plausible on its face. Id. A claim has facial plausibility when the plaintiff pleads factual content that allows the court to draw the reasonable inference that the defendant is liable for the misconduct alleged. Id. Threadbare recitals of the elements of a cause of action, supported by mere conclusory statements, do not suffice. Id. When there are well-pleaded factual allegations, a court should assume their veracity and then determine whether they plausibly give rise to an entitlement to relief. Id. at 679, 129 S.Ct. 1937. A legal conclusion couched as a factual allegation need not be accepted as true on a motion to dismiss, nor are recitations ***1290** of the elements of a cause of action sufficient. Fritz v. Charter Twp. of Comstock, 592 F.3d 718, 722 (6th Cir. 2010). "A court that is ruling on a Rule 12(b)(6) motion may consider materials in addition to the complaint if such materials are public records or are otherwise appropriate for the taking of judicial notice." New England Health Care Emps. Pension Fund v. Ernst & Young, LLP, 336 F.3d 495, 501 (6th Cir. 2003) (citing Jackson v. City of Columbus, 194 F.3d 737, 745 (6th Cir. 1999)).

"The standard of review for entry of judgment on the pleadings under Rule 12(c) is indistinguishable from the standard of review for dismissals based on failure to state a claim under Rule 12(b)(6)." Jackson v. Heh, 215 F.3d 1326 (table), 2000 WL 761807, at *3 (6th Cir. June 2, 2000). Whether a motion proceeds under Rule 12(c) or 12(b)(6) is merely a function of its timing relative to the defendant's filing of its answer.

See Satkowiak v. Bay Cty. Sheriff's Dep't, 47 Fed.Appx. 376, 377 n.1 (6th Cir. 2002).

B. Diligent Prosecution Bar

TVA first asks the Court to dismiss this action altogether under the CWA's diligent prosecution bar. (Doc. No. 12.) Any citizen with constitutional standing to do so may file an action "against any person ... who is alleged to be in violation of ... an effluent standard or limitation" of the CWA. 33 U.S.C. § 1365(a)(1). Under the diligent prosecution bar, however, a citizen cannot file an enforcement suit "if the Administrator or State has commenced and is diligently prosecuting a civil or criminal action in a court of the United States, or a State to require compliance with the standard, limitation, or order" on which the violation is premised. 33 U.S.C. § 1365(b)(1)(B). TVA argues that the Court must dismiss the federal Complaint because the State Enforcement Action represents the State of Tennessee's diligent enforcement of the same standard or limitation as that on which Plaintiffs rely. Plaintiffs argue that the diligent prosecution bar does not apply to this case because: (1) Tennessee's statutes are not comparable to the CWA; (2) Plaintiffs' claims are tailored to target alleged violations that were omitted from the State Enforcement Action; (3) the State's actions do not amount to diligent prosecution; and (4) the Tennessee statutory regime itself permits parallel prosecution.

1. Comparability

Plaintiffs argue first that the diligent prosecution bar does not apply in this case because the TWQCA is insufficiently comparable to the relevant

provisions of the CWA. In so arguing, Plaintiffs rely in significant part on the Sixth Circuit's en banc opinion in Jones v. City of Lakeland, Tennessee, 224 F.3d 518, 521 (6th Cir. 2000). In Jones, riparian landowners sued the City of Lakeland alleging violations of its NPDES permit, and the city argued that the action was barred because the matter was already the subject of an administrative proceeding under the TWQCA. The court concluded that the diligent prosecution bar of 33 U.S.C. § 1365(b)(1)(B) did not apply because the state proceeding was administrative only and no lawsuit had been filed. Id. at 522. The court instead considered whether the case was foreclosed by the similar bar—specific only to situations where the pending action is one for administrative penalties—to be found in 33 U.S.C. § 1319(g)(6)(A). That provision provides that "any violation ... with respect to which a State has commenced and is diligently prosecuting an action under a State law comparable to this subsection ... shall not be the subject of a civil penalty action under ... section 1365 of ***1291** this title."[3] The en banc court concluded that the bar did not apply because the TWQCA's administrative enforcement scheme did not afford sufficient opportunities for citizen participation and therefore was not comparable to the CWA. Id. at 524–25.

As TVA correctly points out, however, 33 U.S.C. § 1365(b)(1)(B), unlike 33 U.S.C. § 1319(g)(6)(A), does not include any language requiring that the relevant state law be "comparable" to the CWA. Jones is clear

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[3] TVA has conceded the inapplicability of the 33 U.S.C. § 1319(g)(6)(A) bar to this case. (Doc. No. 24 at 4.)

that the two bars, though similar, are separate limitations with boundaries that will not necessarily be identical. Moreover, 33 U.S.C. § 1365(b)(1)(B) appears to expressly acknowledge that citizens may not be able to intervene as a matter of right in a state suit, providing that "in any such action in a court of the United States any citizen may intervene as a matter of right." (Emphasis added.) Congress could have limited 33 U.S.C. § 1365(b)(1)(B) to cases where enforcement was taking place in a federal court, or to cases where the citizen was permitted to intervene, but it did not. In any event, the Complaint concedes that "[i]t is the state's policy under these circumstances to allow citizen groups ... to intervene by stipulation in the state court enforcement action." (Doc. No. 1 at ¶ 19.) The TWQCA's imperfect comparability to the CWA therefore does not prevent the application of the diligent prosecution bar here.[4] What is determinative is the degree to which both actions are premised on the violation of the same standard or limitation, namely the NPDES Permit.

2. Scope of Allegations

Plaintiffs next argue that their Complaint should not be dismissed because it targets different violations than the State Enforcement Action. "[A] diligent prosecution bar only applies to those issues

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[4] That is not to say, however, that differences between a state statutory cause of action and the CWA will always be immaterial to the question of whether 33 U.S.C. § 1365(b)(1)(B) should apply. The Court's opinion in this matter does not foreclose the possibility that, in some cases, the procedural inadequacies of a state statute will be so great that they are incompatible with the very concept of diligent prosecution. Here, however, particularly in light of the State's policy of allowing citizen groups to intervene, that does not appear to be the case.

sought to be addressed in a citizen action that overlap with those issues sought to be addressed by the government's suit." United States v. Bd. of Cty. Comm'rs of Hamilton Cty., Ohio, No. 1:02 CV 00107, 2005 WL 2033708, at *11 (S.D. Ohio Aug. 23, 2005) (citing Frilling v. Vill. of Anna, 924 F.Supp. 821, 836 (S.D. Ohio 1996)). Without such a limitation, the diligent prosecution bar would mean that a government enforcement action premised on even a single violation would prevent citizen suits for all, even wholly unrelated, violations. Plaintiffs contend that they carefully drafted their Complaint in this action not to overlap with the State's. TVA argues, in response, that the appropriate test for determining overlap between this case and the State Enforcement Action is not whether a technical distinction can be drawn between the pleadings, but whether they seek to abate and remediate the same issues. See, e.g., Karr v. Hefner, 475 F.3d 1192, 1199 (10th Cir. 2007) (applying diligent prosecution bar despite consent decree's omission of several specific violations alleged by citizen because the consent decree had "as its underlying purpose the resolution of all claims").

***1292** Plaintiffs have identified five sets of allegations raised by their Complaint that are, they contend, omitted from the State Enforcement Action. The first four cite specific types of unlawful discharge of pollutants:

> (1) unauthorized discharges through hydrologic flow into waters of the United States ([Doc. No. 1] at ¶¶ 151–161); (2) improper use of Sinking Creek, a water of the United States, as a wastewater treatment facility (id. at ¶¶ 162–171); (3) unlawful contamination of the groundwater and

> Cumberland River from the Abandoned Ash pond (id. at ¶¶ 172–175) ("Because the State complaint does not include claims for contamination of the Cumberland River from the Abandoned Ash Pond [rather than just the groundwater], the Conservation Groups are enforcing these violations of the Clean Water Act in this Complaint"); [and] (4) unlawful contamination of the groundwater and Cumberland River from the Ash Pond Complex (id. at ¶¶ 176–180) ("Because the State Complaint does not include claims for contamination of the Cumberland River from the Ash Pond Complex, the Conservation Groups are enforcing these violations of the Clean Water Act in this Complaint") ....

(Doc. No. 19 at 10–11.) Finally, Plaintiffs point out that their Complaint alleges violations based on a number of provisions of the NPDES Permit that the State did not cite in its own complaint. (Id. at 11.)

Plaintiffs are correct that its Sinking Creek allegations are nowhere to be found in the State Enforcement Action. Similarly, a review of the State's complaint confirms that, with regard to the Non-Registered Site, the State Enforcement Action is targeted at groundwater contamination, not contamination of the Cumberland River through either seeps or any other leaks or hydrologic connections. (See Doc. No. 13-5 at ¶¶ 20–21.) The Court therefore agrees that discharges from the Non-Registered Site to the Cumberland, either directly or otherwise, represent a discrete set of allegations raised by Plaintiffs in this Court that are not barred by the pendency of the State Enforcement Action.

With regard to the Ash Pond Complex, however, the State's complaint can plausibly be read to refer to both groundwater and surface water contamination. Specifically, the State's complaint pleads violations of the TWQCA arising out of "[a]reas in the dikes where impounded wastewater may [sic] or is escaping from the Ash Pond Complex[,] generally referred to as seeps," without limiting its allegations to groundwater only. (Id. at ¶¶ 35–37, 51.) Nothing in the State's complaint suggests that its claims related to seeps do not contemplate discharges into the Cumberland River as well as the groundwater. Accordingly, the Court agrees with TVA that this action overlaps, at least in part, with the State Enforcement Action with regard to both ground and surface water contamination from the Ash Pond Complex.

The Court agrees with Plaintiffs, however, that their decision to craft their federal Complaint to reach all hydrologic connections, not merely seeps, results in their having pled farther-reaching allegations than the State raised in the Chancery Court. At least as it pertains to the Ash Pond Complex, the State's complaint appears to limit itself to leaks that can be characterized as seeps. Plaintiffs' federal Complaint, in contrast, contemplates both leaks that are purely seeps and leaks based entirely or in part on faster-moving conduit flows, such as through sinkholes and fissures. (Compare Doc. No. 1 at ¶ 152 with Doc. No. 13-5 at ¶¶ 35–37, 51.) The Court therefore concludes that Plaintiffs' allegations that involve forms of wastewater ***1293** flow other than seeps alone do not overlap with the State Enforcement Action.

As for the permit violations, the State's complaint expressly alleges violations of Parts II.A.4.a and II.C.1, but also makes broader reference to "unpermitted discharges," a phrase that, albeit not grounded in a specific citation to NPDES subsections, can be fairly read to encompass the terms of the permit as a whole. (Doc. No. 13-5 at ¶¶ 51–53.) The appropriate test for determining which permit-based claims overlap with the State Enforcement Action therefore is not to mechanically check off which provisions the State has cited, but to look to the substance of the underlying allegations. With regard to alleged unauthorized discharges, it is the view of the Court that the distinctions raised in the preceding paragraphs adequately cover where the respective complaints do and do not overlap.

While the State's complaint was in some ways crafted narrowly, the Complaint in this action was crafted broadly, with references to many alleged violations that plainly overlap with the State Enforcement Action. Plaintiffs, however, have fairly pled some allegations that do not overlap: unlawful use of Sinking Creek as a wastewater treatment facility; unauthorized discharge to the Cumberland River from the Non-Registered Site; and discharge to the Cumberland River from the Ash Pond Complex through hydrologic connections that cannot be characterized solely and exclusively as seeps alone. These conceptually distinct allegations are, contrary to TVA's argument, simply not the "same issues" being pursued by the State (Doc. No. 24 at 5). TVA's conclusory assertion that the State Enforcement Action will remediate issues that are not named in the State's complaint is insufficient to deprive this Court of its jurisdiction to consider those allegations.

3. Lack of Diligent Prosecution

Plaintiffs argue that none of their claims should be dismissed under the diligent prosecution bar, because that State's prosecution has not been diligent. The standard for determining whether an action is being diligently prosecuted, however, has been described as "quite deferential," requiring a plaintiff to "meet a high standard to demonstrate that [the government] has failed to prosecute a violation diligently." Karr, 475 F.3d at 1198. "[A] CWA enforcement action will be considered diligent where it is capable of requiring compliance with the Act and is in good faith calculated to do so." The Piney Run Pres. Ass'n v. The Cty. Comm'rs Of Carroll Cty., Md., 523 F.3d 453, 460 (4th Cir. 2008) (citation omitted). "Section 1365(b)(1)(B) does not require government prosecution to be far-reaching or zealous. It requires only diligence. Nor must an agency's prosecutorial strategy coincide with that of the citizen-plaintiff." Karr, 475 F.3d at 1197.

Plaintiffs' argument that the State Enforcement Action is not being prosecuted diligently consists in large part of Plaintiffs protesting the pace and aggressiveness of the State's litigation efforts. Plaintiffs take particular issue with three features of the State Enforcement Action: first, that TDEC Commissioner Robert Martineau allegedly publicly acknowledged that TVA would "rather be dealing with [TDEC] than a federal judge" (Doc. No. 1-6 at 3); second, that the State did not act diligently to advance the litigation in the months immediately following the filing of its complaint (Doc. No. 19 at 12); and third, that the agreed injunctive order currently in place in the State Enforcement Action

does not itself require ***1294** TVA to come into compliance with the CWA (Doc. No. 111 at 2).

On close examination, however, nothing Plaintiffs have identified rises to the level of showing bad faith or suggesting that the State Enforcement Action is incapable of bringing about compliance with the underlying standards. Insofar as Martineau's statement to the press would be appropriate for the Court's consideration, it is clear from the context of the statement that Martineau was (1) merely attempting to restate something that a TVA representative had allegedly said and (2) the issue was posed to Martineau by a reporter in reference to TVA's alleged lesser exposure to penalties in a state, rather than federal, action. (Doc. No. 1-6 at 3) Even if TVA would prefer to be in State court, and even if the State is aware of that preference, that alone would not amount to a showing of bad faith. As to the delay early in the State Enforcement Action litigation, the experience of the Court is that comparable delays are not so unusual to give rise to an inference of a lack of diligence. Finally, it is unsurprising that the agreed injunctive order in the State Enforcement Action does not itself require compliance, because it does not purport to be a final resolution of the State's allegations. Rather, it appears to be an ordinary intermediate mechanism for managing the flow of the case and the underlying fact finding. (Doc. No. 42-2 at 3–4.) Entering such an order is in no way incompatible with—and may, in some instances, be evidence of—diligent prosecution. Although this Court agrees with Plaintiffs that their federal Complaint includes some allegations that the State is not prosecuting at all, there is no basis for

concluding that, for the claims the State is prosecuting, it is not prosecuting them diligently.

4. State Law

Plaintiffs finally argue that the diligent prosecution bar should not apply, because the TWQCA itself includes language to the effect that the Act is not intended to estop efforts by any party, such as Plaintiffs, to abate pollution. See Tenn. Code Ann. § 69–3–118(b). Plaintiffs' argument misunderstands the relationship between the TWQCA and the CWA. The diligent prosecution bar is a limitation imposed by federal law and enjoying the authority granted it under the Supremacy Clause, U.S. Const. art. VI, cl. 2. The TWQCA can no more render the diligent prosecution bar inapplicable than the State of Tennessee can repeal the CWA altogether.

5. Application of the Bar

At the time Plaintiffs filed their Complaint, the Gallatin Plant was already the subject of a pending enforcement action brought by the State, and, because that State-initiated action has been litigated in apparent good faith and diligence, Plaintiff's claims must be dismissed insofar as they overlap with the allegations at issue in the State's complaint. Some of Plaintiffs' allegations, however, are not barred because, at the time this case was brought, they were not at issue in the State matter. The Court is well aware that the non-overlapping allegations are still closely connected, and that the crisscrossing tracks of the cases will undoubtedly give rise to complications and redundancies. The alternative, though, is to treat the State's decision to proceed narrowly as an absolute bar on citizen enforcement against violations that the State complaint does not

even consider. Such a holding would run counter to the well-recognized role of citizen suits in supplementing government authority under the CWA. Accordingly, the Court will grant TVA's Motion (Doc. No. 12) only in part and will ***1295** dismiss the Plaintiffs' Claims A, C, D, and E under the diligent prosecution bar only insofar as they pertain to violations other than the following: unlawful discharge of pollutants into Sinking Creek; unlawful discharge of pollutants into the Cumberland River from the Non-Registered Site; and unlawful discharge of pollutants from the Ash Pond Complex through hydrologic flows that cannot be characterized as consisting of seeps alone. Any claim premised on one of those three classes of allegation—whether based on statute, rule or permit—survives the diligent prosecution bar.

C. Abstention

In its motion seeking dismissal under the diligent prosecution bar (Doc. No. 12), TVA suggests that, if the Court does not dismiss this matter outright, it should abstain from proceeding under Colorado River Water Conservation District v. United States, 424 U.S. 800, 96 S.Ct. 1236, 47 L.Ed.2d 483 (1976). Pursuant to the Supreme Court's holding in Colorado River, "a federal court may, in certain limited circumstances, decline to adjudicate a claim that is already the subject of a pending state-court case." RSM Richter, Inc. v. Behr Am., Inc., 729 F.3d 553, 556 (6th Cir. 2013). A court called upon to consider Colorado River abstention must engage in a two-step process: first, the Court must determine if the State and federal proceedings are "actually parallel" to one another; and then, only if the

threshold requirement of parallelism is met, the Court will engage in a multi-factor balancing analysis to decide whether to abstain. Romine v. Compuserve Corp., 160 F.3d 337, 339–41 (6th Cir. 1998). Underlying this analysis is the fundamental principle that "federal courts have a strict duty to exercise the jurisdiction that is conferred upon them by Congress." Quackenbush v. Allstate Ins. Co., 517 U.S. 706, 716, 116 S.Ct. 1712, 135 L.Ed.2d 1 (1996) (citing Colorado River, 424 U.S. at 821, 96 S.Ct. 1236). Accordingly, "[a]bstention from the exercise of federal jurisdiction is the exception, not the rule." Colorado River, 424 U.S. at 813, 96 S.Ct. 1236. Because abstention is an "extraordinary and narrow exception to the duty of a District Court to adjudicate a controversy properly before it," the Court will only abstain in cases presenting "the clearest of justifications" for doing so. Rouse v. DaimlerChrysler Corp., 300 F.3d 711, 715 (6th Cir. 2002).

In light of the high standard required to justify abstention, the Court concludes that Plaintiffs' case, as it exists after the application of the diligent prosecution bar, is not sufficiently parallel to justify this Court's inaction under Colorado River. "For the cases to be considered parallel, 'substantially the same parties must be contemporaneously litigating substantially the same issues,' and 'the critical question is whether there is a substantial likelihood that the state litigation will dispose of all claims presented in the federal case.' " Summit Contracting Grp., Inc. v. Ashland Heights, LP, No. 3:16–CV–17, 187 F.Supp.3d 893, 897, 2016 WL 2607056, at *3 (M.D. Tenn. May 6, 2016) (quoting Capitol Wholesale Fence Co. v. Lumber One Wood Preserving, LLC, No. 3:13–cv–00521, 2014 WL 7336236, at *3 (M.D. Tenn.

Dec. 22, 2014) (emphasis added)). TVA has not demonstrated that the State Enforcement Action is substantially likely to dispose of claims arising out of discharges from the Non-Registered Site into the Cumberland River, discharges into Sinking Creek, or discharges from the Ash Pond Complex through leaks that are not seeps. Accordingly, the Court will not abstain in this matter, for the same reasons it did not dismiss the Complaint in full under the diligent prosecution bar.

***1296** D. Claims for Penalties

TVA next asks the Court to dismiss Plaintiff's claims for civil penalties because TVA is an agency of the United States entitled to immunity from penalties under United States Department of Energy v. Ohio, 503 U.S. 607, 611, 112 S.Ct. 1627, 118 L.Ed.2d 255 (1992) ("DOE v. Ohio"). (Doc. No. 28.) Plaintiffs argue that TVA is not entitled to sovereign immunity because it is a corporate instrumentality rather than a federal agency, and that, in the alternative, its immunity has been unequivocally waived.

As it concerns the government of the United States, "[s]overeign immunity is the familiar principle that the government cannot be sued except by the consent of Congress." United States v. Droganes, 728 F.3d 580, 589 (6th Cir. 2013) (citing United States v. Testan, 424 U.S. 392, 399, 96 S.Ct. 948, 47 L.Ed.2d 114 (1976); United States v. Michel, 282 U.S. 656, 659, 51 S.Ct. 284, 75 L.Ed. 598 (1931)). Sovereign immunity extends not only to the United States acting under its own name, but also its agencies. Parrett v. Se. Boll Weevil Eradication Found., Inc., 155 Fed.Appx. 188, 191 (6th Cir. 2005) (citing FDIC v. Meyer, 510 U.S. 471, 475, 114 S.Ct.

996, 127 L.Ed.2d 308 (1994); United States v. Lee, 106 U.S. 196, 205, 1 S.Ct. 240, 27 L.Ed. 171 (1882)). A waiver of sovereign immunity "must be express, clear and unequivocal." Reed v. Reno, 146 F.3d 392, 398 (6th Cir. 1998) (citing Coleman v. Espy, 986 F.2d 1184, 1189 (8th Cir. 1993)). "Further, the language of any waiver of sovereign immunity is strictly construed in favor of the United States." Id. (citing Markey v. United States, 27 Fed.Cl. 615, 622 (Fed. Cl.1993)).

In DOE v. Ohio, the Supreme Court held that the terms of the CWA itself do not waive "the National Government's sovereign immunity from liability for civil fines imposed by a State for past violations" of the Act. 503 U.S. at 611, 112 S.Ct. 1627. In that case, the State of Ohio had sued the United States Department of Energy ("DOE") alleging that the DOE had violated state and federal antipollution laws including the CWA. The DOE did not dispute that it was obligated to comply with the CWA, or that it was potentially subject to injunctive relief or coercive fines—that is to say, fines intended to induce compliance—under the statute. It argued only that, as a federal defendant, it could not be assessed fines based purely on past violations. Id. at 613–14, 112 S.Ct. 1627. The Court agreed, concluding that the CWA's provisions involving federal government entities did not amount to an unequivocal waiver of liability for non-coercive penalties. Id. at 627, 629, 112 S.Ct. 1627. At least one Circuit has applied the reasoning of DOE v. Ohio to conclude that punitive fines may not be assessed against TVA. Sierra Club v. TVA, 430 F.3d 1337, 1357 (11th Cir. 2005).

The law of the Sixth Circuit is that "TVA, as an agency of the United States, enjoys sovereign

immunity unless Congress specifically waives it." Diversified Energy, Inc. v. TVA, 339 F.3d 437, 444 (6th Cir. 2003). "Congress, however, has waived the sovereign immunity of certain federal entities from the times of their inception by including in the enabling legislation provisions that they may sue and be sued." Loeffler v. Frank, 486 U.S. 549, 554, 108 S.Ct. 1965, 100 L.Ed.2d 549 (1988). TVA is one such entity: pursuant to 16 U.S.C. § 831c(b), TVA "[m]ay sue and be sued in its corporate name." "Courts have read this 'sue or be sued' clause as making the TVA liable to suit in tort, subject to certain exceptions." United States v. Smith, 499 U.S. 160, 168–69, 111 S.Ct. 1180, 113 L.Ed.2d 134 (1991). Unlike more specific waivers of sovereign immunity, ***1297** a broad waiver pursuant to a sue-and-be-sued clause "should be liberally construed." Loeffler, 486 U.S. at 554, 108 S.Ct. 1965 (quoting FHA v. Burr, 309 U.S. 242, 245, 60 S.Ct. 488, 84 L.Ed. 724 (1940)). Accordingly, the Supreme Court has held that federal "sue-and-be-sued" entities should generally be held to have a capacity for "liability [that] is the same as that of any other business." Franchise Tax Bd. of Cal. v. U.S. Postal Serv., 467 U.S. 512, 520, 104 S.Ct. 2549, 81 L.Ed.2d 446 (1984).

In the past, the Sixth Circuit has gone so far as to suggest that "[i]t is clear" under TVA's sue-and-be-sued clause that "the TVA enjoys no sovereign immunity." Queen v. TVA, 689 F.2d 80, 85 (6th Cir. 1982) (emphasis added). In intervening years, though, the Supreme Court has reemphasized the high bar to be applied to claims that a government

has waived its sovereign immunity,[5] and the Sixth Circuit has more recently taken a comparatively cautious approach to TVA's waiver. See Diversified Energy, 339 F.3d at 444 (construing TVA's sovereign immunity in the context of express jurisdictional limitations in the Contract Disputes Act). Nevertheless, TVA has not identified any intervening precedents to suggest that the Sixth Circuit has wholly overruled its prior recognition that the sue-and-be-sued clause serves as a broad, general waiver of sovereign immunity unless there is an applicable exception. See also N.C. ex rel. Cooper v. TVA, 515 F.3d 344, 348 (4th Cir. 2008) ("TVA's 'sue-and-be-sued' clause stands as a broad waiver of sovereign immunity ....").

Accordingly, while TVA tries repeatedly to frame the question before the Court as whether the sue-and-be-sued clause "alters" or "transforms" the waiver scheme of the CWA (Doc. No. 29 at 5–6; Doc. No 31 at 2), the appropriate inquiry is the opposite: whether the CWA in some way alters the broad,

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[5] See, e.g., United States v. Bormes, —— U.S. ——, 133 S.Ct. 12, 16, 184 L.Ed.2d 317 (2012) ("Sovereign immunity shields the United States from suit absent a consent to be sued that is unequivocally expressed." (internal quotation marks and citations omitted)); Sossamon v. Texas, 563 U.S. 277, 287, 131 S.Ct. 1651, 179 L.Ed.2d 700 (2011) ("[W]here a statute is susceptible of multiple plausible interpretations, including one preserving immunity, we will not consider a State to have waived its sovereign immunity."); Lane v. Peña, 518 U.S. 187, 192, 116 S.Ct. 2092, 135 L.Ed.2d 486 (1996) ("A waiver of the Federal Government's sovereign immunity must be unequivocally expressed in statutory text ...."); United States v. Nordic Vill. Inc., 503 U.S. 30, 33, 112 S.Ct. 1011, 117 L.Ed.2d 181 (1992) ("Waivers of the Government's sovereign immunity, to be effective, must be unequivocally expressed." (internal quotation marks and citations omitted)).

preexisting waiver to be found in the sue-and-be-sued clause. The Court concludes that it does not. In Loeffler v. Frank, the Supreme Court considered the interplay between a federal cause of action with a limited waiver of sovereign immunity and a federal entity's preexisting, broad sue-or-be-sued waiver. 486 U.S. at 565, 108 S.Ct. 1965. In that case, the United States Postal Service was subject to a broad waiver of sovereign immunity under its authorizing statutes. The plaintiff, however, sued under Title VII, which had a narrower waiver of sovereign immunity, in particular with regard to the recovery of prejudgment interest. Id. at 556–59, 108 S.Ct. 1965. The Court concluded that the original, broader waiver remained intact, because "neither the language of ... Title VII nor its legislative history contains an expression that the waiver of sovereign immunity it effected was intended also to narrow the waiver of sovereign immunity of entities subject to sue-and-be-sued clauses." Id. at 562, 108 S.Ct. 1965.

***1298** The CWA similarly evinces no intent to change the scope of TVA's well-established waiver of sovereign immunity. DOE v. Ohio was not premised on the conclusion that Congress reached an express and deliberate conclusion that government entities should be subject to coercive, but not punitive, CWA fines. Rather, the Supreme Court based its holding on the CWA's silence and ambiguity on the matter. 503 U.S. at 628, 112 S.Ct. 1627. Undoubtedly, silence and ambiguity are grounds for concluding that a statute does not itself waive an entity's sovereign immunity. Here, however, the immunity had already been waived. The Court sees no reason to read the CWA's silence and ambiguity as grounds for decreasing the scope of a waiver that already existed.

See Good v. Ohio Edison Co., 149 F.3d 413, 418 (6th Cir. 1998) ("[A] waiver of sovereign immunity in a new cause of action will not be presumed to be exclusive unless such an intention is expressly mandated by Congress.") (citing Loeffler, 486 U.S. at 562, 108 S.Ct. 1965)).

Nor is the Court persuaded by TVA's citation to Missouri Pacific Railroad v. Ault, 256 U.S. 554, 41 S.Ct. 593, 65 L.Ed. 1087 (1921), and that case's progeny for the proposition that, even when an instrumentality is subject to a broad, general waiver of immunity, a court cannot impose a penalty in the absence of an additional waiver specifically addressing punitive remedies. As the Third Circuit has observed, "Ault concerned the sovereign immunity of the government itself," not the immunity of a Loeffler-type entity that, like TVA, has been "launched ... into the commercial world." Pennsylvania v. U.S. Postal Serv., 13 F.3d 62, 66 (3d Cir. 1993) (quoting Franchise Tax Bd., 467 U.S. at 520, 104 S.Ct. 2549). TVA nevertheless suggests that the Sixth Circuit adopted TVA's preferred rule by applying Ault to the FDIC in Commerce Federal Savings Bank v. FDIC, 872 F.2d 1240, 1247–48 (6th Cir. 1989). TVA is correct that the FDIC, like TVA, is subject to a sue-or-be-sued provision. See 12 U.S.C. 1819(a) ([T]he Corporation ... shall have power ... [t]o sue and be sued, and complain and defend, by and through its own attorneys, in any court of law or equity, State or Federal."). TVA is mistaken, though, in arguing that the Sixth Circuit premised its holding on finding an exception or limitation to that provision. The Commerce Federal opinion simply does not discuss, let alone find an exception to, the sue-and-be-sued clause. Rather, the court based its

holding on the fact that "the FDIC is clearly an instrumentality of the United States, and ... the appellant has failed to identify any express Congressional authority permitting imposition of punitive fines or penalties." 872 F.2d at 1258. That rationale is merely a statement of the applicable blackletter law that applies in the absence of a statutory waiver. The Court is therefore not convinced that Commerce Federal should be read as a sub rosa reversal of the Circuit's longstanding case law acknowledging the broad, liberal construction of TVA's sue-and-be-sued clause. The Court therefore concludes that Plaintiffs' claims for penalties are permitted under the broad waiver of sovereign immunity found in 16 U.S.C. § 831(c).

E. Jury Demand

TVA argues next that the Court should strike Plaintiffs' jury demand because a plaintiff has no right to a jury trial in an action against a federal agency unless expressly granted that right by law. (Doc. No. 28.) Although Plaintiffs do not dispute the general proposition that the right to a jury trial in an action against the United States must be expressly granted, they argue that that rule does not extend to corporate instrumentalities, like TVA, that ***1299** are the subject of broad sue-and-be-sued clauses. The Sixth Circuit considered these respective arguments, albeit in an unpublished opinion, in Davis v. Henderson, 238 F.3d 420 (table), 2000 WL 1828476 (6th Cir. Dec. 4, 2000). There, the plaintiff postal employee brought suit against the Postmaster General, who was subject to a Loeffler general waiver of sovereign immunity. The court concluded that "Congress has provided for a general waiver of the Postal Service's sovereign immunity, but that

general waiver did not create a right to a jury trial." Id. at *2.

The presumption against finding a right to a jury trial in a suit against the United States is founded in part on the protections of sovereign immunity, but also in significant part on the historical understanding of the right to a civil jury trial itself, as codified by the Seventh Amendment. "It has long been settled that the Seventh Amendment right to trial by jury does not apply in actions against the Federal Government." Lehman v. Nakshian, 453 U.S. 156, 160, 101 S.Ct. 2698, 69 L.Ed.2d 548 (1981); see also Galloway v. United States, 319 U.S. 372, 388, 63 S.Ct. 1077, 87 L.Ed. 1458 (1943) (holding that Seventh Amendment does not apply to actions against the United States because "[i]t hardly can be maintained that under the common law in 1791 jury trial was a matter of right for persons asserting claims against the sovereign"). Accordingly, insofar as any plaintiff has a right to a jury trial against the United States, it is not because the Seventh Amendment applies to the matter by its own terms, but "because Congress [,] in the legislation cited, has made it applicable." Galloway, 319 U.S. at 389, 63 S.Ct. 1077. In that regard, a provision granting a jury trial against the United States performs two functions: first, it waives the sovereign immunity that would deprive the courts of jurisdiction over such a case; and second, it creates a procedural right to a jury trial that otherwise would not have existed under the Constitution alone.

The sue-and-be-sued clause, therefore, at best gets Plaintiffs halfway to a jury trial: it may remove the barrier created by sovereign immunity, but

nothing in its language suggests that it creates a right to a jury in the first place. Plaintiffs do not identify any other specific statutory provisions entitling them to a jury trial, relying instead on the Seventh Amendment, as applied to the CWA in Tull v. United States, 481 U.S. 412, 427, 107 S.Ct. 1831, 95 L.Ed.2d 365 (1987). Plaintiffs argue that the Seventh Amendment's failure to reach actions against the United States should not be read to include corporate instrumentalities such as TVA. The well-established practice in the Sixth Circuit, however, is to recognize TVA's status as a federal agency, even if it is one that has waived its protection from suit. See Gillham v. TVA, 488 Fed.Appx. 80, 81 (6th Cir. 2012) ("TVA is a 'wholly-owned corporate agency and instrumentality of the United States.' " (quoting Hill v. U.S. Dep't of Labor, 65 F.3d 1331, 1333 (6th Cir. 1995))); McCarthy v. Middle Tenn. Elec. Membership Corp., 466 F.3d 399, 411 n.18 (6th Cir. 2006) ("[T]here is no question that 'TVA is an agency and instrumentality of the United States.' "); TVA v. Kinzer, 142 F.2d 833, 837 (6th Cir. 1944) ("[TVA] is plainly a governmental agency or instrumentality of the United States."). The Court therefore will adopt the rule set forth in Davis v. Henderson and strike Plaintiffs' jury demand.

F. Permit Shield

TVA argues next that the CWA's "permit shield" provision, 33 U.S.C. § 1342(k), entitles it to dismissal or judgment on the pleadings with regard to two ***1300** sets of allegations: (1) all allegations, under any of Plaintiffs' claims, premised on seeps from the ash ponds (Doc. No. 51); and (2) Plaintiffs' Claim B, premised on the improper use of Sinking Creek as a water of the United States (Doc. No. 12). The permit

shield provides that "[c]ompliance with a permit issued pursuant to [the NPDES] shall be deemed compliance" with various standards and limitations under the CWA, including those at issue here. Id. The purpose of the permit shield is "to relieve [permit holders] of having to litigate in an enforcement action the question whether their permits are sufficiently strict." Sierra Club v. ICG Hazard, LLC, 781 F.3d 281, 285 (6th Cir. 2015) (quoting E.I. du Pont de Nemours & Co. v. Train, 430 U.S. 112, 138 n.28, 97 S.Ct. 965, 51 L.Ed.2d 204 (1977)). The Sixth Circuit has adopted a two-pronged analysis for determining whether the permit shield will apply to a particular allegation: "[f]irst, the permit holder must comply with the CWA's reporting and disclosure requirements"; and, "[s]econd, ... the discharges must be within the permitting authority's 'reasonable contemplation.' " ICG Hazard, 781 F.3d at 286 (quoting Piney Run Pres. Ass'n v. Cty. Comm'rs of Carroll Cty., Md., 268 F.3d 255, 267 (4th Cir. 2001)). The question of "reasonable contemplation" focuses in particular on whether the alleged discharges were "within the reasonable contemplation of the permitting authority during the permit application process." Id. (quoting Piney Run, 268 F.3d at 267) (emphasis added).

In Sierra Club v. ICG Hazard, LLC, the Sixth Circuit concluded that discharges of pollutants that are not expressly included in a permit may still be subject to the shield if the pollutants had been within the reasonable contemplation of the permitting agency when the permit was issued. Id. at 286–88. For example, in that case, the defendant was accused of making unlawful discharges of selenium, and the relevant permit did not expressly authorize

discharge of selenium into the relevant waters. The court nevertheless applied the permit shield to selenium discharges, because its review of the permitting process and context revealed that the permitting authority was aware of and had considered the possibility of selenium discharges when it issued the permit. Id. at 290.

While Plaintiffs do not dispute that this rule applies to discharges of unnamed pollutants, they urge the Court not to extend it to unnamed outfall locations, or at least not unnamed outfall locations that Plaintiffs argue may be characterized as independent point sources. Such a rule, they argue, is inconsistent with the CWA's provisions requiring an NPDES permit for "all point sources of discharge of pollutants." 33 U.S.C. § 1311(e). Nothing in the text of the permit shield provision, however, suggests that it should apply differently to violations based on the location of the discharge than it does to violations based on which pollutants are involved. The determinative issue is whether the party is in "[c]ompliance with" the relevant NPDES permit, 33 U.S.C. § 1342(k), which the Sixth Circuit has read to mean that the discharges at issue were within the reasonable contemplation of the issuing agency. ICG Hazard, 781 F.3d at 286. As this Court reads both the case law and the purposes underlying the "reasonable contemplation" test, the Court should evaluate every feature of an alleged violation to determine if the relevant discharge or possibility thereof was adequately disclosed and reasonably contemplated. That inquiry may lead the Court to examine the pollutants at issue, but also the location of discharge, its magnitude, or any other relevant trait. The Court's analysis will inevitably be closely

tied to a review of what the permittee itself disclosed, because "the ***1301** scope of the permit as well as the discharge limitations contained therein are based largely on information provided by the permit applicant."[6] In Re Ketchikan Pulp Co., 7 E.A.D. 605, 1998 WL 284964, at *10 (E.P.A. May 15, 1998). The Court now turns to the classes of allegation to which TVA seeks to apply the permit shield.

1. Seeps

TVA argues that all of Plaintiffs' claims based on seeps are categorically barred by the permit shield because seeps were within the reasonable contemplation of TDEC when it issued the NPDES Permit.[7] TVA relies on the fact that, during the comment period for the NPDES Permit, the potential for seeps was brought to TDEC's attention, and TDEC concluded that the permit adequately accounted for that risk. Specifically, after TDEC published its "Permit Rationale" for public comment, it received comments about the possibility of seeps, which TDEC considered and acknowledged. (Doc. No. 1-2 at 48.)

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[6] For this reason, the Court rejects Plaintiffs' argument that the Court should restrict itself to considering only the text of the NPDES Permit under the parol evidence rule. The permit shield rule, as adopted by the Sixth Circuit, requires the Court to look to the permitting process itself to determine what manner of discharges were disclosed and reasonably contemplated when the permit was under consideration. ICG Hazard, 781 F.3d at 286 (quoting Piney, 268 F.3d at 267).

[7] Although the Court has concluded that the diligent prosecution bar prevents the Plaintiffs from bringing claims based solely on seeps alone from the Ash Pond Complex, any claims involving seeps from the Non-Registered Site have so far survived TVA's motions.

That TDEC contemplated some seeps under the permit, however, does not categorically shield TVA from liability for all seeps. TDEC's responses to comments describe the type of seepage that the agency anticipated from the ponds in a number of ways, for example: as having a "flow rate ... so low as not to be measurable"; as "more similar to a nonpoint source discharge, as it is diffused over a wide area"; and, perhaps most importantly, as resulting in only "de minimus [sic]" additional loading of pollutants. (Doc. No. 1-2 at 48.) The permit shield only protects discharges that the permit itself reasonably contemplates, and the NPDES Permit did not contemplate any and all manner of seepage without limitation. Moreover, the permit's toleration of even the contemplated seepage is in the context of TVA's presumed compliance with NPDES Permit provisions specifically designed to address the risk of seeps. Part III.B.(2) through (4) of the NPDES Permit, for example, require that TVA comply with self-inspection requirements intended to detect, among other things, seepage in the ponds' earthen dikes, and that TVA take timely remediation measures if it discovers any changes indicating a potential compromise in the structural integrity of the impoundment. (Doc. No. 1-2 at 26.) Among the failures Plaintiffs allege in their Complaint is that TVA "failed to properly maintain the impoundments to prevent seeps, or to properly inspect, identify, and remediate these seeps." (Doc. No. 1 at ¶ 65.) Finally, the mere fact that TDEC was aware of some seeps or the possibility thereof does not mean that TVA necessarily fully and accurately disclosed all relevant seeps at the time the NPDES Permit was reissued. Among the key allegations in this case is that TVA's

actions have been insufficient to adequately identify and monitor the seeps. A permit applicant cannot disclose discharges that it does not know about.

The Court accordingly does not read the NPDES Permit as extending its ***1302** permit shield protection categorically to any and all seeps. That is not to say that the permit shield may not serve as a defense to specific allegations. If TVA can eventually show that specific seeps were only of the type contemplated by the permit, and that the seeps' detection, monitoring, reporting, disclosure, and, if necessary, remediation, were handled in full compliance with the permit, the permit shield may apply. Such a conclusion, however, cannot be reached on the pleadings alone. TVA's Motion for Judgment on the Pleadings as to All of Plaintiffs' Claims Regarding Seeps (Doc. No. 51) will therefore be denied.

2. Sinking Creek

TVA argues next that Plaintiffs' Claim B, which challenges the Gallatin Plant's use of the alleged Sinking Creek area for the Ash Pond Complex, should be dismissed because the use of Ash Ponds A and E as treatment ponds was contemplated by and in compliance with the NPDES Permit. As the Complaint concedes, "[t]he NPDES Permit treats the discharges of waste streams ... into Sinking Creek as internal outfalls within a waste treatment system," rather than as discharges into the waters of the United States. (Doc. No. 1 at ¶ 168.) It is clear from the Complaint and the NPDES Permit itself that TVA's use of the Ash Pond Complex as a wastewater treatment facility is central to the overall treatment system that the Permit envisions. (See Doc. No. 1 at ¶ 168; Doc. No. 1-2 at 57 (describing ash ponds)). Nor

can it be said that TVA failed to disclose its plans for using the area at issue for its series of Ash Ponds. (See, e.g., Doc. 18-6 at PageID 619 (including map of ash ponds in permit renewal application)). TVA can hardly be blamed for its failure to make further disclosures or reports related to Sinking Creek, given that the NPDES Permit itself had accepted its premise that the Ash Pond Complex was a treatment facility.

As TVA correctly points out, Plaintiffs' Sinking Creek argument is in essence a collateral attack on the permit itself. See Nat'l Parks Conservation Ass'n v. TVA, 175 F.Supp.2d 1071, 1078–79 (E.D. Tenn. 2001) (holding that citizens could not collaterally challenge terms of Clean Air Act permit). Because the flow of contaminants from the Gallatin Plant to Ash Ponds A & E is both disclosed under and reasonably contemplated by the NPDES permit, TVA's Motion to Dismiss for Failure to State a Claim (Doc. No. 12) will be further granted in part and Claim B will be dismissed. The Court's ruling on this issue renders moot TVA's Motion for Summary Judgment on Plaintiffs' Claim B. (Doc. No. 57.)

G. Claims Under Specific Permit Provisions

Finally, TVA seeks judgment on the pleadings with regard to Plaintiffs' Claim E and its subclaims, each arising out of an alleged violation of a different term of the NPDES Permit. (Doc. No. 102.) With regard to each of the provisions Plaintiff cites, TVA argues either that the provision is inapplicable or that Plaintiffs have not pled facts setting forth a plausible claim on which relief can be granted. Generally speaking, the Court must interpret an NPDES Permit in the same manner as it would a contract, determining first whether a particular term

has an unambiguous meaning, and, if the meaning is ambiguous, looking to the document as a whole, its underlying purpose, and, if necessary, appropriate extrinsic evidence to aid the Court's construction. Piney Run, 268 F.3d at 269–70. While the Court's interpretation of the Permit is a question of law, Nw. Envtl. Advocates v. City of Portland, 56 F.3d 979, 982 (9th Cir. 1995), ***1303** Plaintiffs' underlying factual allegations remain entitled to the presumption of truth ordinary to any other motion under Rule 12(c).

1. Subsections I.A.b & c

Plaintiffs' Claims E.a and E.b allege violations of subsections I.A.b and I.A.c of the NPDES permit, which provide:

> Additional monitoring requirements and conditions applicable to Outfalls 001, 002, and 004 include:
>
> [....]
>
> b. The wastewater discharge shall not contain pollutants in quantities that will be hazardous or otherwise detrimental to humans, livestock, wildlife, plant life, or fish and aquatic life in the receiving stream. The discharge activity shall not cause or contribute to violations of water quality criteria as stated in the TDEC Rules, Chapter 1200-4-2-.03. Under no circumstances may discharges create an exceedance of the numeric water quality criteria in the receiving stream for aquatic and human life as stated in State of Tennessee Rule 1200-4-3.
>
> c. Sludge or any other material removed by any treatment works must be disposed of in a manner, which prevents its entrance into or

> pollution of any surface or subsurface waters. Additionally, the disposal of such sludge or other material must be in compliance with the Tennessee Solid Waste Disposal Act, TCA § 68–31–101 et seq. and the Tennessee Hazardous Waste Management Act, TCA 68–46–101 et seq.

(Doc. No. 1-2 at 11.) Plaintiffs assert that the Gallatin Plant's alleged unlawful discharges through contaminated groundwater violate subsection I.A.b and that its seeps violate subsection I.A.c. (Doc. No. 1 at ¶ 182–88.)

TVA points out, however, that these provisions are by their own terms only "applicable to Outfalls 001, 002, and 004."[8] The very essence of Plaintiffs' allegations, TVA argues, is that the allegedly unlawful discharges are not happening through authorized outfalls. With regard to subsection I.A.b, the plain language of the permit supports TVA's reading. The express target of subsection I.A.b is "wastewater discharge"; as applied to Outfalls 001,

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[8] Plaintiffs suggest that the phrase "applicable to Outfalls 001, 002, and 004" should be read only to refer to "conditions," and not "monitoring requirements," and that subsections I.A.b and I.A.c are therefore generally applicable to all discharges as monitoring requirements. (Doc. No. 119 at 10.) This argument is unavailing for two reasons. First, the paragraph immediately prior to these provisions discusses discharges of certain types of cooling water and concludes, "There are no limits or monitoring requirements for these discharges." (Doc. No. 1-2 at 11.) It is therefore clear that the permit is indeed discussing discharge-specific monitoring requirements as well as conditions. Second, subsections I.A.b and I.A.c are simply not monitoring requirements. Subsections I.A.e and I.A.g, for example, do actually address monitoring and reporting of discharges. Subsections I.A.b and I.A.c are plainly conditions with which the discharges must comply.

002, and 004, that language clearly refers to wastewater discharge from those outfalls. TVA's argument is less persuasive, however, with regard to subsection I.A.c. The target of subsection I.A.c is not the wastewater discharge itself but the disposal of "sludge or other material removed by any treatment works." The plain language of the provision clearly encompasses sludge or other material removed by means other than merely through discharge at the named outfalls. "Removal" through seeps or other leaks could therefore theoretically be encompassed by the provision.

***1304** TVA argues next that subsection I.A.c does not apply because the wastewater allegedly discharged through its seeps is not sludge. Subsection I.A.c, however, encompasses not only sludge but "any other material removed by any treatment works." It is a well established "canon of interpretation that words in a list should be given separate meaning to avoid surplusage." Crossville, Inc. v. Kemper Design Ctr., Inc., No. 2:09–0120, 2010 WL 2650731, at *4 (M.D. Tenn. July 2, 2010) (citing Snodgrass v. Snodgrass, 295 S.W.3d 240, 248 (Tenn. 2009)). Subsection I.A.c therefore should be construed to reach not merely sludge, but any material removed by treatment works. Judgment on the pleadings is therefore inappropriate as to Claim E.b.

2. Subsection II.A.4.a

NPDES Permit subsection II.A.4.a requires TVA to "at all times properly operate and maintain all facilities and systems (and related appurtenances) for collection and treatment which are installed or used by the permittee to achieve compliance with the terms and conditions of the permit." (Doc. No 1–2 at

19.) Plaintiffs allege that several aspects of TVA's maintenance of the ponds has been inadequate to achieve compliance with the permit. (Doc. No 1 at ¶¶ 189–98.) TVA argues that Plaintiffs' assertion is a legal conclusion masquerading as a question of fact, and that its actions were, as a matter of law, in compliance with subsection II.A.4.a. TVA is mistaken. The question of whether TVA's maintenance of its ponds has been adequate is unavoidably bound up with fact and inappropriate for resolution by the Court on the pleadings alone. For example, as the Court has noted supra, the NPDES permit contemplated seepage from the Ash Ponds at levels that, at most, would result in de minimis additional pollutant loading. Whether seeps from the Non-Registered Site exceed de minimis levels raises factual questions both about the seeps themselves and what would qualify as de minimis in the context of coal ash wastewater discharges. Whether TVA's response to the seeps has been sufficient to safeguard the structural integrity of the ponds—as required by the permit (Doc No. 1-2 at 26)—presents another example of a question of fact. While the construction of the Permit's terms presents a question of law, a term like "properly," used in a specialized setting such as this one, sets forth a standard that must be understood and evaluated in a factual context that cannot be gathered solely from the four corners of the document. TVA is not entitled to judgment on the pleadings with regard to claim E.c.

C. Subsection II.C.2

NPDES Permit subsection II.C.2 creates an obligation to inform regulators within twenty-four hours of certain events:

> In the case of any noncompliance which could cause a threat to public drinking supplies, or any other discharge which could constitute a threat to human health or the environment, the required notice of non-compliance shall be provided to the Division of Water Pollution Control in the appropriate regional Field Office within 24-hours from the time the permittee becomes aware of the circumstances.

(Doc. No. 1-2 at 17.) The Complaint alleges that TVA violated this provision by failing to alert regulators when it became aware that its ash ponds had contaminated the surrounding area through unauthorized discharges. TVA argues that it did not violate the 24-hour notice requirement because its seeps were contemplated by the NPDES Permit itself. This is merely a reiteration of TVA's permit shield argument and fails for the same reason: although ***1305** the NPDES permit reasonably contemplated some de minimis seeps, that reasonable contemplation does not create a shield for any and all manner and volume of seeps possible. Moreover, subsection II.C.2 does not merely reach instances of noncompliance but also "any other discharge which could constitute a threat to human health or the environment." Plaintiffs have adequately pled that the alleged discharges could constitute a threat to human health or the environment, triggering the notice provision. Plaintiffs' Claim E.d therefore cannot be disposed of with judgment on the pleadings.

3. Subsection II.C.3

NPDES Permit subsection II.C.3.b forbids "Sanitary Sewer Overflows" at the Gallatin Plant,

which the permit defines as follows: " 'Sanitary Sewer Overflow' means the discharge to land or water of wastes from any portion of the collection, transmission, or treatment system other than through permitted outfalls." (Doc. No.1-2 at 22.) Plaintiffs contend that all discharges of ash pond wastewater other than through Outfall 001 are prohibited sanitary sewer overflows. TVA argues that, in context, the "wastes" mentioned in the definition of "sanitary sewer overflow" refers only to raw sewage from sanitary wastes, and that the Gallatin Plant has a separate system for sanitary waste disposal. TDEC regulations define a "sanitary sewer" as a "conduit intended to carry liquid and water-carried wastes from residences, commercial buildings, industrial plants and institutions together with minor quantities of ground, storm and surface waters that are not admitted intentionally." Tenn. Comp. R. & Regs. 0400–46–02–.02(43). TDEC's reference to "liquid and water-carried wastes" appears, on its face, to be plainly capable of encompassing coal ash wastewater. TVA, however, draws the Court's attention to public EPA documents that appear consistent with the position that "sanitary sewer" is a specialized term that would be inapplicable to wastes other than untreated sewage. See National Pollution Discharge Elimination System (NPDES), Sanitary Sewer Overflow (SSO) Frequent Questions, at https://www.epa.gov/npdes/sanitary-sewer-overflow-sso-frequent-questions#sso (last updated Nov. 16, 2015); EPA Fact Sheet: Why Control Sanitary Sewer Overflows, at 1 (Jan. 11, 2001) ("Sanitary sewer overflows (SSOs) are releases of untreated sewage into the environment."), available at

https://www3.epa.gov/npdes/pubs/sso_casestudy_control.pdf. These EPA documents, however, appear to be guides for the edification of a general audience and do not necessarily resolve the question of how the term "sanitary sewer" might apply to the peculiar situation of coal ash wastewater that is sluiced to ponds for treatment.

The Court is therefore unable, at this stage, to conclude, based only on the pleadings and documents appropriate for judicial notice in the Rule 12(c) context, that unauthorized coal ash discharges are, as a matter of law, incapable of qualifying as sanitary sewage overflows. If, once a factual record is developed, TVA has shown that the accepted understanding of the terms make it clear that, in context, the only waste at issue is raw sewage, TVA may be entitled to judgment on this claim. At this stage, however, the request for judgment on the pleadings with regard to Claim E.e will be denied.

III. MOTION FOR SUMMARY JUDGMENT

Plaintiffs have filed a Motion for Partial Summary Judgment (Doc. No. 106) arguing that it is entitled to summary judgment on several of its claims because the discharges as conceded by the TVA are ***1306** sufficient to give rise to per se violations under the CWA's regime of strict liability.

A. Standard of Review

In reviewing a motion for summary judgment, this Court will only consider the narrow questions of whether there is any "genuine dispute as to any material fact" and whether "the movant is entitled to judgment as a matter of law." Fed. R. Civ. P. 56(a). A motion for summary judgment requires that the Court view the "inferences to be drawn from the

underlying facts ... in the light most favorable to the party opposing the motion." Matsushita Elec. Indus. Co. v. Zenith Radio Corp., 475 U.S. 574, 587, 106 S.Ct. 1348, 89 L.Ed.2d 538 (1986) (quoting United States v. Diebold, Inc., 369 U.S. 654, 655, 82 S.Ct. 993, 8 L.Ed.2d 176 (1962)). "The party bringing the summary judgment motion has the initial burden of informing the Court of the basis for its motion and identifying portions of the record that demonstrate the absence of a genuine dispute over material facts." Rodgers v. Banks, 344 F.3d 587, 595 (6th Cir. 2003). After the movant has satisfied this initial burden, the nonmoving party has the burden of showing that a "rational trier of fact [could] find for the non-moving party [or] that there is a 'genuine issue for trial.' " Matsushita, 475 U.S. at 587, 106 S.Ct. 1348. If the evidence offered by the nonmoving party is "merely colorable," or "not significantly probative," or not enough to lead a fair-minded jury to find for the nonmoving party, the motion for summary judgment should be granted. Anderson, 477 U.S. at 249–52. "A genuine dispute between the parties on an issue of material fact must exist to render summary judgment inappropriate." Hill v. White, 190 F.3d 427, 430 (6th Cir. 1999) (citing Anderson, 477 U.S. at 247–49, 106 S.Ct. 2505).

Related to Plaintiffs' Motion, TVA has filed a Request for Judicial Notice (Doc. No. 136) asking the Court to take notice of documentation related to TVA's NPDES permit for another facility in New Johnsonville, Tennessee. TVA had cited the terms of the New Johnsonville permit as a point of comparison in its argument that Plaintiffs are not entitled to summary judgment. Although the Court is not considering the New Johnsonville plant, and the

Court is skeptical of how selective citation to one other NPDES permit will illuminate its consideration of the Gallatin Plant, the Request for Judicial Notice will be granted insofar as the cited materials are relevant to the consideration of the Motion.

B. Alleged Per Se Violations

Plaintiffs argue that they are entitled to summary judgment on several counts because the groundwater discharges and seeps they have identified represent per se violations of the Clean Water Act actionable under 33 U.S.C. § 1311(a). A party seeking to establish a Clean Water Act violation generally must establish "five elements ...: (1) a pollutant must be (2) added (3) to navigable waters (4) from (5) a point source." Nat'l Wildlife Fed'n v. Consumers Power Co., 862 F.2d 580, 583 (6th Cir. 1988) (emphasis omitted). Recovery in this particular case, however, presents a few additional hurdles. First, as the Court has explained, the pending State Enforcement Action prevents the Court from exercising its jurisdiction with regard to some of Plaintiffs' allegations. The Court must limit its consideration to issues left out of the State's complaint, specifically: discharges from the Non-Registered Site into the Cumberland River; and discharges from the Ash Pond Complex that involve hydrologic flows other than those that can be characterized as seeps alone. Open factual issues exist with regard to ***1307** the extent of the discharges that fall within these two circumscribed categories. Moreover, TVA has demonstrated that some seeps were contemplated by TDEC at the time of the reissuance of the NPDES Permit in 2012. Therefore, although TVA is not entitled to a blanket

judgment on the pleadings under the permit shield defense, there are outstanding issues of fact with regard to that defense that would preclude summary judgment in Plaintiffs' favor. TVA is entitled to an opportunity to demonstrate that the discharges on which Plaintiffs rely were of the type disclosed to and reasonably contemplated by TDEC at the time the NPDES Permit was under consideration.

Because Plaintiffs filed their Motion for Partial Summary Judgment before the Court had ruled on TVA's Motion to Dismiss for Failure to State a Claim (Doc. No. 12) or its Motion for Judgment on the Pleadings as to All of Plaintiffs' Claims Regarding Seeps (Doc. No. 51), Plaintiffs have understandably failed to address these factors in their motion. Even if the Plaintiffs' had had such an opportunity, however, it appears likely to the Court that open questions about the extent of TVA's defenses would likely preclude the Court from granting summary judgment. In any event, Plaintiffs' Motion will be denied, and it is the hope of the Court that the parties will be able to sharpen the focus of this litigation in light of the issues raised in this Memorandum at the forthcoming status conference.

IV. CONCLUSION

For the foregoing reasons, TVA's Motion to Dismiss for Failure to State a Claim (Doc. No. 12) will be **GRANTED** in part and **DENIED** in part; TVA's Motion to Dismiss Plaintiffs' Claim for Civil Penalties and Jury Demand (Doc. No. 28) will be **DENIED** as to civil penalties and **GRANTED** as to Plaintiffs' jury demand, and the Court will STRIKE Plaintiffs' demand for a jury; TVA's Motion for Judgment on the Pleadings as to All Plaintiffs'

Claims Regarding Seeps (Doc. No. 51) will be **DENIED**; TVA's Motion for Summary Judgment on Plaintiffs' Claim B (Doc. No. 57) will be **DENIED AS MOOT**; TVA's Motion for Judgment on the Pleadings as to Plaintiffs' Claim E (Doc. No. 102) will be **GRANTED** as to Claim E.a and **DENIED** as to all other claims; TVA's Request for Judicial Notice (Doc. No. 136) will be **GRANTED**; and Plaintiffs' Motion for Partial Summary Judgment (Doc. No. 106) will be **DENIED**. Plaintiffs' Claims B and E.a will be **DISMISSED**. Claims A, C, D, E.b, E.c, E.d, and E.e will be **DISMISSED** except insofar as they deal with one or both of the following: discharges from the Non-Registered Site into the Cumberland River; and discharges from the Ash Pond Complex via hydrologic flows that are not seeps alone.

An appropriate order will issue.

s/ WAVERLY D. CRENSHAW, JR.
UNITED STATES DISTRICT JUDGE

RECOMMENDED FOR FULL-TEXT
PUBLICATION
Pursuant to Sixth Circuit I.O.P. 32.1(b)

File Name: 19a0006p.06

UNITED STATES COURT OF APPEALS

FOR THE SIXTH CIRCUIT

TENNESSEE CLEAN WATER NETWORK; TENNESSEE SCENIC RIVERS ASSOCIATION, *Plaintiffs-Appellees,* v. TENNESSEE VALLEY AUTHORITY, *Defendant-Appellant.*	No. 17-6155

Appeal from the United States District Court for the
Middle District of Tennessee at Nashville.
No. 3:15-cv-00424 – Waverly D. Crenshaw Jr.,
District Judge.

Decided and Filed: January 17, 2019

Before SUHRHEINRICH, CLAY, and GIBBONS,
Circuit Judges.

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STRANCH, J. (pp. 3–6), delivered a separate dissenting opinion in which COLE, C.J., and MOORE, CLAY, WHITE, and DONALD, JJ., joined. A copy of Judge Clay's dissent to the court's opinion of September 24, 2018 is appended, (app. 1–11).

ORDER

***593**

The court received a petition for rehearing en banc. The original panel has reviewed the petition for rehearing and concludes that the issues raised in the petition were fully considered upon the original submission and decision. The petition then was

circulated to the full court. Less than a majority of the judges voted in favor of rehearing en banc.

Therefore, the petition is denied.

Judge Clay would grant rehearing for the reasons stated in his dissent.

DISSENT

JANE B. STRANCH, Circuit Judge, dissenting from the denial of rehearing en banc.

In seeking to harmonize the Clean Water Act (CWA) and the Resource Conservation and Recovery Act (RCRA), the majority opinion in this case takes up an issue of exceptional importance. Its holding that the CWA does not apply to discharges of pollutants from coal ash ponds that reach surface waters after traveling through groundwater (1) relies on a single preposition that is not found in the CWA provision at issue and (2) is at odds with every other circuit and our own precedent. I therefore respectfully dissent from the denial of en banc review.

The district court concluded its 123-page opinion by explaining that, with the benefit of hindsight and decades of data, "it is difficult to imagine why anyone would choose to build an unlined [coal] ash waste pond in karst terrain immediately adjacent to a river." (R. 258, PageID 10,542) TVA does not contest the district court's factual finding that pollutants from these ash ponds

reached a navigable river. Nor could it. TVA's expert "conceded that there is coal ash in the Cumberland River in the area surrounding the Gallatin Plant, as shown by TVA's own testing." (*Id.*, PageID 10,486) The danger of coal ash to riverine environments and to the communities that depend on that river is indisputable—and, indeed, the majority does not attempt to dispute it. *See Tenn. Clean Water Network v. TVA*, 905 F.3d 436, 447 (6th Cir. 2018).

We need not look far to find a vivid example of how that danger affects Tennesseans. Just last month, an East Tennessee jury returned a verdict against Defendant TVA in a suit brought by the workers who cleaned up a 2008 coal ash spill. *See Adkisson v. Jacobs Eng'g Grp., Inc.*, No. 3:13-CV-00505, D.E. 408 (E.D. Tenn.). Media coverage of the case stated that 30 of the workers are dead and more than 250 are sick or dying.[1] And the problems did not end with the cleanup. Recent journalism reports that coal ash storage facilities established in the wake of that disaster are already leaking arsenic and radium into groundwater and that the EPA has found a spike in coal ash constituents in groundwater test wells.[2]

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[1] *See* Jamie Satterfield, *Jury: Jacobs Engineering Endangered Kingston Disaster Clean-up Workers*, *Knoxville News Sentinel* (Nov. 7, 2018, 12:02 PM), https://www.knoxnews.com/story/news/crime/2018/11/07/verdict-reached-favor-sickened-workers-coal-ash-cleanup-lawsuit/1917514002/.

[2] *See* Jamie Satterfield, *Testing Reveals Groundwater Contamination Threat from TVA's Kingston Coal Ash Landfill*, *Knoxville News Sentinel* (Dec. 13, 2018, 5:00 AM), https://www.knoxnews.com/story/news/crime/2018/12/13/kingston-coal-ash-landfill-roane-county-groundwater-

This environmental issue reaches beyond Tennessee's problem with TVA's coal ash ponds. Many other types of installations pollute navigable waters via discharges to groundwater. *See, e.g.*, ***594** *Upstate Forever v. Kinder Morgan Energy Partners, LP*, 887 F.3d 637, 643–44 (4th Cir. 2018) (describing 369,000 gallons of gasoline spilled from an underground pipeline that leaked through groundwater into creeks, lakes, and a river). The majority opinion, in seeking to harmonize the CWA and RCRA, has deprived regulators and affected citizens of a critical tool—in some circumstances, the only tool—to combat those various types of seeping pollution.

That result is not mandated by statutory text. The only support the majority opinion finds in the text of the CWA is the word "into." *Tenn. Clean Water Network*, 905 F.3d at 444. I agree with the dissent that it is dubious that Congress hid such a sizable loophole in a preposition—especially in a preposition that is not even found in the portion of the statute at issue in this case. *Id.* at 450–51 (Clay, J., dissenting). And even if we assume that the meaning of the word "into" is the critical inquiry, the definitions cited by the majority require only entry, not "direct" entry. *See Rapanos v. United States*, 547 U.S. 715, 743, 126 S.Ct. 2208, 165 L.Ed.2d 159 (2006) (plurality) (Scalia, J.) ("The Act does not forbid the 'addition of any pollutant *directly* to navigable waters from any point source,' but rather the 'addition of

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testing/2283487002/.

any pollutant *to* navigable waters.' " (citations omitted)). Pollutants are discharged from coal ash ponds *into* navigable waters just as a rocket is launched from the ground *into* space or a path leads from a city *into* a forest—inevitably, but not immediately.

The majority opinion's only other rationale is that "allowing the CWA to cover pollution of this sort would disrupt the existing regulatory framework" under RCRA. *Tenn. Clean Water Network*, 905 F.3d at 445. But we have answered that claim before and clarified how the CWA (which governs water pollution) and RCRA (which governs disposal of solid and hazardous waste) interact. When a polluting factory operator claimed that the hazardous waste dumped into a lagoon was exempt from RCRA because the lagoon was governed by the CWA, we explained that "only the actual discharges from a holding pond or similar feature into surface waters ... are governed by the Clean Water Act, not the contents of the pond or discharges into it." *United States v. Dean*, 969 F.2d 187, 194 (6th Cir. 1992). So too with coal ash ponds. "Actual discharges" from the ponds to surface waters are governed by the CWA, and everything else—from the strength of the embankment surrounding a pond to the frequency of its inspections and the design of its liner—is governed by RCRA. This reading acknowledges the realistic interaction between the two Acts, and their sensible enforcement relationship. It does not "effectively nullify" RCRA's implementing regulations.[3] *Tenn. Clean Water Network*, 905 F.3d at

[3] Indeed, the Environmental Protection Agency proposed the

446 (citation omitted).

The majority's interpretation, on the other hand, *could* effectively nullify RCRA. The majority reasons that, if a coal ash pond received a CWA permit, it would be removed from RCRA's coverage. *Id.* By this logic, if a landfill has a system for collecting rainwater and discharging it into a river, governed by the CWA pursuant to 40 C.F.R. Part 445, the rest of the landfill's ***595** operations would be exempt from RCRA. Likewise, if TVA's own power plants have CWA permits pursuant to 40 C.F.R. Part 423, the plants' other operations would be exempt from RCRA—including, presumably, its rules about disposal of coal ash. But that is indisputably not the case.

In light of my disagreement with the two bases of the majority's decision, I do not think splitting from every other circuit that has considered this issue is warranted. *See Upstate Forever*, 887 F.3d at 650 ("[A] point source is the starting point or cause of a discharge under the CWA, but that starting point need not also convey the discharge directly to navigable waters."); *Haw. Wildlife Fund v. County of Maui*, 886 F.3d 737, 746 (9th Cir. 2018) ("This case is no different—the effluent comes 'from' the four wells

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Coal Combustion Residuals (CCR) Rule pursuant to RCRA while acknowledging that the CWA governs discharges from coal ash ponds to surface waters. *See* Hazardous and Solid Waste Management System, 75 Fed. Reg. 35,128, 35,142 (June 21, 2010) ("The discharge of pollutants from CCR management units to waters of the United States are regulated under the National Pollutant Discharge Elimination System (NPDES) at 40 CFR Part 122, authorized by the Clean Water Act (CWA).").

and travels 'through' them before entering navigable waters. It just also travels through groundwater before entering the Pacific Ocean." (citation omitted)); *see also Waterkeeper All., Inc. v. EPA*, 399 F.3d 486, 510–11 (2d Cir. 2005) (holding manure spread across fields is a point source); *Sierra Club v. Abston Constr. Co.*, 620 F.2d 41, 45 (5th Cir. 1980) (holding "gravity flow" from miners' spoil piles is a point source).[4]

Though I appreciate the majority's acknowledgement of the importance of identifying some path to a remedy, I do not think it is accurate to conclude that "other environmental laws have

[4] Neither of the cases TVA now cites as showing a circuit split stands for the proposition at issue here—that identifiable, measurable pollution that reaches surface waters after traveling through groundwater is not covered under the CWA. *Village of Oconomowoc Lake v. Dayton Hudson Corp.* holds only that the CWA does not "assert[ ] authority over ground waters, just because these may be hydrologically connected with surface waters." 24 F.3d 962, 965 (7th Cir. 1994). There is no dispute that groundwater is outside the scope of the CWA; the issue is whether pollution of surface water is excused because the pollutants first traveled through groundwater. *Rice v. Harken Exploration Co.* interprets the Oil Pollution Act of 1990 (OPA), not the CWA. 250 F.3d 264, 266–67 (5th Cir. 2001). Even assuming the case is relevant, *Rice* holds only that, when "nothing in the record ... could convince a reasonable trier of fact that either Big Creek or any of the unnamed other intermittent creeks on the ranch are sufficiently linked to an open body of navigable water as to qualify for protection under the OPA," then "a generalized assertion that covered surface waters will eventually be affected by remote, gradual, natural seepage from the contaminated groundwater is insufficient to establish liability under the OPA." *Id.* at 271–72. In this case, plaintiffs do not rely on a "generalized assertion," but rather on a substantial body of evidence—including, as described above, the concession of TVA's expert—showing pollutants from coal ash ponds entered a navigable river.

been enacted to remedy" pollution that seeps from coal ash ponds into surface waters. *Tenn. Clean Water Network*, 905 F.3d at 447. I doubt the feasibility of using a statute designed to govern solid waste to regulate pollution of rivers. I am even less confident that existing environmental law can fill the new loopholes created now that a polluter can escape liability under the CWA "by moving its drainage pipes a few feet from the river bank." *Id.* (Clay, J., dissenting). For these reasons and those articulated more fully in Judge Clay's dissenting opinion, I respectfully dissent from the denial of rehearing en banc.

ENTERED BY ORDER OF THE COURT
s/ Deborah S. Hunt, Clerk

APPENDIX

CLAY, Circuit Judge, dissenting. Can a polluter escape liability under the Clean Water Act ("CWA"), 33 U.S.C. §§ 1251–1387, by moving its drainage pipes a few feet from the riverbank? The Fourth and Ninth Circuits have said no. In two cases ***596** today,[1] the majority says yes. Because the majority's conclusion is contrary to the plain text and history of the CWA, and because I disagree with the majority's analysis of the permit's Sanitary Sewer Overflow provision, I respectfully dissent from the majority's position as to these issues.

I. Scope of the Clean Water Act

Plaintiffs have invoked the CWA's citizen-suit provision, which provides that "any citizen may commence a civil action ... against any person ... who is alleged to be in violation of ... an effluent standard or limitation under this chapter[.]" 33 U.S.C. § 1365(a). "For purposes of this section, the term 'effluent standard or limitation under this chapter' means," among other possibilities, "an unlawful act under subsection (a) of section 1311 of this title." § 1365(f). In turn, § 1311(a) prohibits "the discharge of any pollutant by any person[.]"

[1] The other case is Case No. 18-5115, *Kentucky Waterways Alliance, et al. v. Kentucky Utilities Co.*

The broad sweep of a defendant's potential CWA liability is limited in two ways. First, Congress included a list of exceptions in § 1311(a) itself: the discharge of a pollutant is unlawful "[e]xcept in compliance with this section and sections 1312, 1316, 1317, 1328, 1342, and 1344 of this title." Second, Congress gave the phrase "discharge of a pollutant" a very specific definition: it means "any addition of any pollutant to navigable waters from any point source." 33 U.S.C. § 1362(12)(A). Taken together, Congress thus authorized citizen suits to prevent the "addition of any pollutant to navigable waters from any point source," *see* § 1362(12)(A), but if a listed statutory exception applies, *see* § 1311(a).

The majority argues that this standard cannot be satisfied when, as here, pollution travels briefly through groundwater before reaching a navigable water. Plaintiffs counter that such an exception has no statutory basis and would allow polluters to shirk their CWA obligations by placing their underground drainage pipes a few feet away from the shoreline. This case could have profound implications for those in this Circuit who would pollute our Nation's waters. And the issue is novel. This Court has never before considered whether the CWA applies in this context.

However, the Fourth and Ninth Circuits have. Both courts determined that a short journey through groundwater does not defeat CWA liability. *See Upstate Forever v. Kinder Morgan Energy Partners, L.P.*, 887 F.3d 637, 649–51 (4th Cir. 2018); *Hawai'i Wildlife Fund v. Cty. of Maui*, 886 F.3d 737, 745–49 (9th Cir. 2018). The Second Circuit reached a similar

conclusion where the pollutants traveled briefly through fields (which are not necessarily point sources) and through the air. *See Concerned Area Residents for Env't v. Southview Farm*, 34 F.3d 114, 118–19 (2d Cir. 1994) (fields); *Peconic Baykeeper, Inc. v. Suffolk Cty.*, 600 F.3d 180, 188–89 (2d Cir. 2010) (air). Until today, no Circuit had come out the other way. The reason is simple: the CWA does not require a plaintiff to show that a defendant discharged a pollutant from a point source *directly* into navigable waters; a plaintiff must simply show that the defendant "add[ed] ... any pollutant *to* navigable waters *from* any point source." *See* §§ 1362(12)(A) (emphases added), 1365(a), 1311(a); *Upstate Forever*, 887 F.3d at 650; *Hawai'i Wildlife Fund*, 886 F.3d at 749.

***597** The Supreme Court addressed this precise issue in *Rapanos v. United States*, 547 U.S. 715, 126 S.Ct. 2208, 165 L.Ed.2d 159 (2006). There, Justice Scalia's plurality opinion was explicit:

> The Act does not forbid the "addition of any pollutant *directly* to navigable waters from any point source," but rather the "addition of any pollutant *to* navigable waters." [33 U.S.C.] § 1362(12)(A) (emphasis added); § 1311(a). Thus, from the time of the CWA's enactment, lower courts have held that the discharge into intermittent channels of any pollutant *that naturally washes downstream* likely violates § 1311(a), even if the pollutants discharged from a point source do not emit "directly into" covered waters, but pass "through conveyances" in between. *United States v. Velsicol Chemical*

> *Corp.*, 438 F.Supp. 945, 946–947 (W.D.Tenn. 1976) (a municipal sewer system separated the "point source" and covered navigable waters). See also *Sierra Club v. El Paso Gold Mines, Inc.*, 421 F.3d 1133, 1137, 1141 (C.A.10 2005) (2.5 miles of tunnel separated the "point source" and "navigable waters").

Id. at 743 (plurality opinion) (emphasis in original). True, Justice Scalia's plurality opinion is not binding. But no Justice challenged this aspect of the opinion, and for good reason: the statutory text unambiguously supports it.

Further, applying the CWA to point-source pollution traveling briefly through groundwater before reaching a navigable water promotes the CWA's primary purpose, which is to "restore and maintain the chemical, physical, and biological integrity of the Nation's waters." 33 U.S.C. § 1251(a). By contrast, the majority's approach defeats the CWA's purpose by opening a gaping regulatory loophole: polluters can avoid CWA liability by discharging their pollutants into groundwater, even if that groundwater flows immediately into a nearby navigable water. This exception has no textual or logical foundation. As one district court observed,

> it would hardly make sense for the CWA to encompass a polluter who discharges pollutants via a pipe running from the factory directly to the riverbank, but not a polluter who dumps the same pollutants into a man-made settling basin some distance

> short of the river and then allows the pollutants to seep into the river via the groundwater.

See N. Cal. River Watch v. Mercer Fraser Co., No. C-04-4620 SC, 2005 WL 2122052, at *2 (N.D. Cal. Sept. 1, 2005). In addition, this exception has no apparent limits. Based on the majority's logic, polluters are free to add pollutants to navigable waters so long as the pollutants travel through any kind of intermediate medium—for example through groundwater, across fields, or through the air. This would seem to give polluters free rein to discharge pollutants from a sprinkler system suspended above Lake Michigan. After all, pollutants launched from such a sprinkler system would travel "in all directions, guided only by the general pull of gravity." *Kentucky Waterways Alliance*, 18-5115 at 11. According to the majority, this would defeat CWA liability.[2]

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[2] The majority declines to reverse the district court's other finding that a coal ash pond is a point source under the CWA, but suggests disagreement in a footnote. The CWA defines "point source" as "any discernible, confined and discrete conveyance," including "any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, or vessel or other floating craft, from which pollutants are or may be discharged." 33 U.S.C. § 1362(14). The majority cites a recent Fourth Circuit case, *Sierra Club v. Va. Elec. & Power Co.*, 903 F.3d 403 (4th Cir. 2018), which held that a coal ash pond is not a point source because it was a "static recipient[ ] of the precipitation and groundwater that flowed through [it]." 903 F.3d at 411. Looking at the text of the CWA, however, shows that, *inter alia*, "ditch[es], well[s], container[s]," and "vessel[s]" are included in the definition. 33 U.S.C. § 1362(14). The canon of *ejusdem*

generis states that "the general term must take its meaning from the specific terms with which it appears." *Retail Ventures, Inc. v. Nat'l Union Fire Ins. Co. of Pittsburgh*, 691 F.3d 821, 833 (6th Cir. 2012). The common denominator between wells, containers, ditches, and vessels is that each is a man-made, defined area where liquid collects. The canon of *ejusdem generis* thus suggests that man-made coal ash ponds are included in this definition. The Fourth Circuit instead cites a dictionary definition of "conveyance" as "a facility—for the movement of something from one place to another" without explaining how items like wells, containers, and vessels fit this definition. *Va. Elec. & Power Co.*, 903 F.3d at 410 (quoting *Webster's Third New International Dictionary* 499 (1961)). The Fourth Circuit suggests that a container can be a point source only if it is in the act of conveying something, 903 F.3d at 412–13, ignoring that the statutory definition includes "*any* ... container ... from which pollutants are or may be discharged." 33 U.S.C. § 1362(14) (emphasis added).

The Fourth Circuit's approach is further misguided in that it conflicts with the broad interpretation that federal courts have traditionally given to the phrase "point source." *See, e.g.*, *Simsbury-Avon Pres. Club, Inc. v. Metacon Gun Club, Inc.*, 575 F.3d 199, 219 (2d Cir. 2009) (quoting *Dague v. City of Burlington,* 935 F.2d 1343, 1354–55 (2d Cir. 1991), *rev'd on other grounds*, 505 U.S. 557, 112 S.Ct. 2638, 120 L.Ed.2d 449 (1992)) ("[T]he definition of a point source is to be broadly interpreted."); *Cmty. Ass'n for Restoration of the Env't v. Henry Bosma Dairy*, 305 F.3d 943, 955 (9th Cir. 2002) (quoting *Dague,* 935 F.2d at 1354–55); *Cmty. Ass'n for Restoration of Env't (CARE) v. Sid Koopman Dairy*, 54 F.Supp.2d 976, 980 (E.D. Wash. 1999) (citing *Dague,* 935 F.2d at 1354–55); *Yadkin Riverkeeper, Inc. v. Duke Energy Carolinas, LLC*, 141 F.Supp.3d 428, 444 (M.D. N.C. 2015) (quoting *Dague,* 935 F.2d at 1354–55); *see United States v. Earth Scis., Inc.*, 599 F.2d 368, 373 (10th Cir. 1979) ("[T]he concept of a point source was designed to further [the CWA's regulatory] scheme by embracing the broadest possible definition of any identifiable conveyance from which pollutants might enter the waters of the United States."). By embracing a restrictive definition of what constitutes a point source, the Fourth Circuit jettisons these long-standing principles.

***598** I have a very different view. In cases where, as here, a plaintiff alleges that a defendant is polluting navigable waters through a complex pathway, the court should require the plaintiff to prove the existence of pollutants in the navigable waters and to persuade the factfinder that the defendant's point source is to blame—that the defendant is unlawfully "add[ing] ... any pollutant to navigable waters from any point source." 33 U.S.C. § 1362(12)(A). The more complex the pathway, the more difficult the proof. Where these cases are plausibly pleaded, they should be decided on the facts.

Instead, the majority holds that a plaintiff may never—as a matter of law—prove that a defendant has unlawfully added pollutants to navigable waterways via groundwater. For its textual argument, the majority refers us to the term "effluent limitations." This term, the majority says, is defined as "restrictions on the amount of pollutants that may be 'discharged from point sources *with* navigable waters.' " Maj. Op. at 11(quoting emphasis 3 U.S.C. § 1362(11)). Seizing on the word "into"—which denotes "entry, introduction, insertion"—the majority concludes that the effluent-limitation definition implicitly creates an element of "directness." In other words, the majority reasons, "for a point source to discharge *into* navigable waters, it must dump *directly* into those navigable waters[.]" *Id.* (emphasis in original).

The majority is way off the rails. First of all, "Congress 'does not alter the fundamental ***599** details of a regulatory scheme in vague terms or ancillary provisions—it does not, one might say, hide elephants in mouseholes.' " *Epic Sys. Corp. v. Lewis*, —— U.S. ——, 138 S.Ct. 1612, 1626–27, 200 L.Ed.2d 889 (2018) (quoting *Whitman v. Am. Trucking Assns., Inc.*, 531 U.S. 457, 468, 121 S.Ct. 903, 149 L.Ed.2d 1 (2001)). The majority should heed this commonsense advice. Congress did not hide a massive regulatory loophole in its use of the word "into."

But more importantly, the majority's quoted definition of "effluent limitation" from § 1362(11)—the supposed origin of the loophole—is not relevant to this case. The citizen-suit provision uses the term "effluent standard or limitation"—not the term "effluent limitation." *See* 33 U.S.C. § 1365(f). As the majority itself argues, minor distinctions in statutory language sometimes matter. This one does. The phrase "effluent standard or limitation" is a term of art and is wholly distinct from the term "effluent limitation." This conclusion is supported not by tea leaves or a carefully selected dictionary, but rather by the CWA itself. The citizen-suit provision of the CWA provides that "effluent standard or limitation" means, among other things, "an unlawful act under subsection (a) of section 1311 of this title." 33 U.S.C. § 1365(a). Turning to § 1311(a), we find that, absent certain exceptions, "the discharge of any pollutant by any person shall be unlawful," § 1311(a), and the "discharge of a pollutant" means "any addition of any pollutant *to* navigable waters from any point source," § 1362(12)(A) (emphasis added). Thus, even assuming the majority correctly parses the definition

of "into"—a dubious proposition at best—the word "into" is not contained in any of the statutory provisions at issue. Rather, we find the word "to," which does not even arguably suggest a requirement of directness; the word "to" merely "indicate[s] movement or an action or condition suggestive of movement toward a place, person, or thing reached." *To*, Merriam-Webster Dictionary, https://www.merriam-webster.com/dictionary/to.

It is therefore entirely unclear why the majority relies on the definition of "effluent limitation." That definition is simply irrelevant to this lawsuit. As a result, the majority's criticisms of the approach taken by the Fourth and Ninth Circuits miss the mark. Indeed, the Fourth Circuit analyzed the correct statutory text when it rejected the argument that the citizen-suit provision requires directness:

> [t]he plain language of the CWA requires only that a discharge come "from" a "point source." *See* 33 U.S.C. § 1362(12)(A). Just as the CWA's definition of a discharge of a pollutant does not require a discharge directly to navigable waters, *Rapanos*, 547 U.S. at 743, 126 S.Ct. 2208, neither does the Act require a discharge directly from a point source, *see* 33 U.S.C. § 1362(12)(A). The word "from" indicates "a starting point: as (1) a point or place where an actual physical movement ... *has its beginning*." Webster's Third New International Dictionary 913 (Philip Babcock Gove et al. eds., 2002) (emphasis added); *see also* The American Heritage Dictionary of the English Language 729 (3d ed. 1992) (noting "from" indicates a "starting point"

> or "cause"). Under this plain meaning, a point source is the starting point or cause of a discharge under the CWA, but that starting point need not also convey the discharge directly to navigable waters.

Upstate Forever, 887 F.3d at 650 (footnote omitted). In short, if the majority would like to add a "directness" requirement to ***600** § 1311, it must fight the statutory text to get there.

In addition, the majority fails to meaningfully distinguish Justice Scalia's concurrence in *Rapanos*, which made clear that the CWA applies to indirect pollution. It is true that *Rapanos* dealt with different facts. But it is irrelevant that the pollution in *Rapanos* traveled through point sources before reaching a navigable water, whereas the pollution in this case traveled through groundwater, which, according to the majority, is not a point source. In both cases, the legal issue is the same: whether the CWA applies to pollution that travels from a point source to navigable waters through a complex pathway. *See Rapanos*, 547 U.S. at 745, 126 S.Ct. 2208 (asking whether "the contaminant-laden waters ultimately reach covered waters"). Indeed, Justice Scalia favorably cited the Second Circuit's discussion in *Concerned Area Residents for the Environment*. *Rapanos*, 547 U.S. at 744, 126 S.Ct. 2208. In that case, pollutants traveled across fields—which "were not necessarily point sources themselves"—before reaching navigable waters. *Hawai'i Wildlife Fund*, 886 F.3d at 748. Given the Supreme Court plurality's endorsement of the Second Circuit's approach, the majority's attempt to distinguish *Rapanos* collapses.

Next, the majority warns that imposing liability would upset the cooperative federalism embodied by the CWA. On this view, the states alone are responsible for regulating pollution of groundwater, even if that pollution later travels to a navigable water. Wrong again. To be sure, the CWA recognizes the "primary responsibilities and rights of States" to regulate groundwater pollution. 33 U.S.C. § 1251(b). But imposing liability in this case would not marginalize the states. To the contrary, the district court made clear that it was *not* regulating the pollution of groundwater itself. *See Tennessee Clean Water Network v. Tennessee Valley Authority*, 273 F.Supp.3d 775, 826 (M.D.Tenn. 2017) ("The Court agrees with those courts that view the issue not as whether the CWA regulates the discharge of pollutants into groundwater itself but rather whether the CWA regulates the discharge of pollutants to navigable waters via groundwater." (quotation marks, alteration, and citation omitted)). Instead, the district court was addressing pollution of a navigable water—specifically, the Cumberland River—via groundwater. This distinction was clear to the Fourth and Ninth Circuits. *See Upstate Forever*, 887 F.3d at 652 ("We do not hold that the CWA covers discharges to ground water itself. Instead, we hold only that an alleged discharge of pollutants, reaching navigable waters ... by means of ground water with a direct hydrological connection to such navigable waters, falls within the scope of the CWA."); *Hawai'i Wildlife Fund*, 886 F.3d at 749 ("[T]he County's concessions conclusively establish that pollutants discharged from all four wells emerged at discrete points in the Pacific Ocean.... We

leave for another day the task of determining when, if ever, the connection between a point source and a navigable water is too tenuous to support liability under the CWA."). Accordingly, imposing liability in this case fits perfectly with the CWA's stated purpose: to "restore and maintain the chemical, physical, and biological integrity of the Nation's waters." 33 U.S.C. § 1251(a).

Finally, the majority offers a narrow reading of the CWA because, in its view, a more inclusive reading would render "virtually useless" the Coal Combustion Residuals ("CCR") Rule under the Resource Conservation and Recovery Act ("RCRA"). Maj. Op. at 13. The majority notes that if a polluter's conduct is regulated through a CWA permit, then RCRA does not also ***601** apply. The majority therefore suggests that a straightforward reading of the CWA is incompatible with RCRA. The majority would gut the former statute to save the latter.

But the EPA has already dismissed the majority's concern. Indeed, the EPA issued federal regulations on this issue many decades ago. The EPA's interpretation is that the industrial discharge of waste such as CCR is subject to regulation under both RCRA and the CWA: RCRA regulates the way polluters store CCR, and the CWA kicks in the moment CCR enters a navigable waterway. *See* 40 C.F.R. § 261.4(a)(2). The EPA first articulated this approach in a set of regulations from 1980, which provide that "[i]ndustrial wastewater discharges that are point source discharges subject to regulation under section 402 of the Clean Water Act" "are not solid wastes for the purpose of" the RCRA exclusion.

40 C.F.R. § 261.4(a)(2). This exclusion, the regulation explains, "applies only to the *actual point source discharge*. It does not exclude industrial wastewaters while they are being collected, stored or treated before discharge, nor does it exclude sludges that are generated by industrial wastewater treatment." § 261.4(a)(2) (comment) (emphasis added). Thus, under the EPA's reading, a polluter can be liable under RCRA for improperly storing CCR—even if the CCR never enters a navigable waterway. *See id.* Conversely, a polluter can be liable under the CWA for adding CCR to a navigable waterway—even if the polluter's storage methods comport with RCRA. *See id.* And of course, a polluter can be liable under both statutes if the polluter both improperly stores CCR and discharges it to a navigable waterway. *See id.*

The EPA settled any doubts on this matter by publishing a detailed description of its rationale in the Federal Register. *See* 45 Fed. Reg. 33098. The EPA explained that 40 C.F.R. § 261.4(a)(2) reflects the EPA's interpretation that regulation of a polluter's discharge of industrial waste to a navigable waterway pursuant to the CWA does *not* trigger the 42 U.S.C. § 6903(27) exclusion and therefore does *not* exempt that polluter's storage of CCR from regulation under RCRA:

> The obvious purpose of the industrial point source discharge exclusion in Section 1004(27) was to avoid duplicative regulation of point source discharges under RCRA and the Clean Water Act. Without such a provision, the discharge of wastewater into navigable waters would be "disposal" of solid waste, and

potentially subject to regulation under both the Clean Water Act and Subtitle C [of RCRA]. These considerations do not apply to industrial wastewaters prior to discharge since most of the environmental hazards posed by wastewaters in treatment and holding facilities—primarily groundwater contamination—cannot be controlled under the Clean Water Act or other EPA statutes.

Had Congress intended to exempt industrial wastewaters in storage and treatment facilities from all RCRA requirements, it seems unlikely that the House Report on RCRA would have cited, as justification for the development of a national hazardous waste management program, numerous damage incidents which appear to have involved leakage or overflow from industrial wastewater impoundments. *See, e.g.*, H.R. Rep. at 21. Nor would Congress have used the term "discharge" in Section 1004(27). This is a term of art under the Clean Water Act (Section 504(12)) and refers only to the "addition of any pollutant to navigable waters", not to industrial wastewaters prior to and during treatment.

***602** Since the comment period closed on EPA's regulations, both Houses of Congress have passed amendments to RCRA which are designed to provide EPA with more flexibility under Subtitle C in setting standards for and issuing permits to existing facilities which treat or store hazardous wastewater. *See* Section 3(a)(2) of H.R. 3994 and Section 7 of S.1156. *See also* S. Rep. No. 96-173, 96th Cong., 1st Sess. 3

> (1979); Cong. Rec. S6819, June 4, 1979 (daily ed.); Cong. Rec. H1094–1096, February 20, 1980 (daily ed.). These proposed amendments and the accompanying legislative history should lay to rest any question of whether Congress intended industrial wastewaters in holding or treatment facilities to be regulated as "solid waste" under RCRA.

45 Fed. Reg. 33098. Congress ratified the EPA's interpretation when it enacted amendments to RCRA, which the EPA said would "lay to rest" any concerns about whether industrial wastes like CCR are subject to regulation under both RCRA (in terms of their storage and treatment) and the CWA (in terms of their discharge to navigable waters). *Id.*; *see* Public Law 96-482. From this history, and from the text of the statutes, we can surmise that Congress intended to delegate to the EPA the power "to speak with the force of law" on this aspect of the interplay between RCRA and the CWA. *See United States v. Mead Corp.*, 533 U.S. 218, 229, 121 S.Ct. 2164, 150 L.Ed.2d 292 (2001). Exercising this authority, the EPA reached an interpretation that is different from—and incompatible with—that of the majority.

Contravening bedrock principles of administrative law, the majority bulldozes the EPA's interpretation of its own statutory authority without even discussing the possibility of deference. But "[w]e have long recognized that considerable weight should be accorded to an executive department's construction of a statutory scheme it is entrusted to administer, and the principle of deference to administrative interpretations." *Chevron, U.S.A.,*

Inc. v. Nat. Res. Def. Council, Inc., 467 U.S. 837, 844, 104 S.Ct. 2778, 81 L.Ed.2d 694 (1984).

> In *Chevron*, this Court held that ambiguities in statutes within an agency's jurisdiction to administer are delegations of authority to the agency to fill the statutory gap in reasonable fashion. Filling these gaps, the Court explained, involves difficult policy choices that agencies are better equipped to make than courts. 467 U.S. at 865–866, 104 S.Ct. 2778. If a statute is ambiguous, and if the implementing agency's construction is reasonable, *Chevron* requires a federal court to accept the agency's construction of the statute, even if the agency's reading differs from what the court believes is the best statutory interpretation.

Nat'l Cable & Telecomms. Ass'n v. Brand X Internet Servs., 545 U.S. 967, 980, 125 S.Ct. 2688, 162 L.Ed.2d 820 (2005). The EPA says that imposing CWA liability for the discharge of CCR to navigable waterways does not eliminate the possibility of RCRA liability for the storage and treatment of CCR. The majority suggests the exact opposite. Unfortunately for the majority, but fortunately for those who enjoy clean water, the majority lacks the authority to override longstanding EPA regulations on a whim. *See id.*

For all these reasons, I believe the CWA clearly applies to the pollution in this case. Accordingly, I would join our sister circuits in holding that the

CWA prohibits all pollution that reaches navigable waters "by means of ground water with a direct hydrological connection to such navigable ***603** waters[.]" *Upstate Forever*, 887 F.3d at 652; *see Hawai'i Wildlife Fund*, 886 F.3d at 745–49. Under this standard, the unpermitted leaks from NRS and Complex are clearly unlawful.

II. The Permit's Sanitary Sewer Overflow Provision

The permit prohibits "Sanitary Sewer Overflows," which it defines as "the discharge to land or water of wastes from any portion of the collection, transmission, or treatment system other than through permitted outfalls." (R. 1-2, permit, PageID# 79.) The district court found, and TVA no longer disputes, that the Complex discharges coal ash waste to groundwater through its unlined, leaking sides and bottoms. These discharges are not authorized by the permit. Therefore, Plaintiffs have proven a permit violation.

The majority avoids this result by overcomplicating the issue. Ignoring the plain text of the permit, the majority instead champions the EPA's standard definition of "Sanitary Sewer Overflow," which is narrow and arguably saves TVA from liability. This reasoning is perplexing. The EPA's definition should play no role in the legal analysis here because the permit itself defines "Sanitary Sewer Overflow." Indeed, TVA's permit expert conceded in the district court that the permit's definition is broader than the EPA's definition.

Accordingly, this Court should apply the plain text of the permit's definition, as it would apply the plain text of any contract. This Court has no plausible authority or reason to substitute a definition provided in the permit with one drafted in a different context by a nonparty who has no relation to this case.

Further, the EPA's standard definition makes little sense in this context. As the majority recognizes, that definition applies only to sewage from sanitary sewer systems. But a coal ash pond is not a "sanitary sewer system." It does not contain "sewage." Consequently, interpreting the Sanitary Sewer Overflow provision to regulate sewage alone would render the provision meaningless. This Court should avoid such an interpretation, especially when the permit itself provides a definition that does not trigger any such concerns. *See Gallo v. Moen Inc.*, 813 F.3d 265, 273 (6th Cir. 2016) (noting the general rule that "courts should interpret contracts to avoid superfluous words").

For these reasons, I would hold that the district court correctly ruled that the Complex's karst-related leaks violate the sanitary-sewer provision.

Conclusion

As set forth above, I believe that the CWA applies to TVA's indirect pollution of navigable waters and that TVA violated the permit's Sanitary Sewer Overflow provision. Because the majority disagrees as to both issues, I respectfully dissent.

RELEVANT STATUTORY PROVISIONS
33 U.S.C. § 1251

(a) Restoration and maintenance of chemical, physical and biological integrity of Nation's waters; national goals for achievement of objective

The objective of this chapter is to restore and maintain the chemical, physical, and biological integrity of the Nation's waters. In order to achieve this objective it is hereby declared that, consistent with the provisions of this chapter—

(1) it is the national goal that the discharge of pollutants into the navigable waters be eliminated by 1985;

(2) it is the national goal that wherever attainable, an interim goal of water quality which provides for the protection and propagation of fish, shellfish, and wildlife and provides for recreation in and on the water be achieved by July 1, 1983;

(3) it is the national policy that the discharge of toxic pollutants in toxic amounts be prohibited;

(4) it is the national policy that Federal financial assistance be provided to construct publicly owned waste treatment works;

(5) it is the national policy that areawide waste treatment management planning processes be developed and implemented to assure adequate control of sources of pollutants in each State;

(6) it is the national policy that a major research and demonstration effort be made to develop technology necessary to eliminate the discharge of pollutants into the navigable waters, waters of the contiguous zone, and the oceans; and

(7) it is the national policy that programs for the control of nonpoint sources of pollution be developed and implemented in an expeditious manner so as to enable the goals of this chapter to be met through the control of both point and nonpoint sources of pollution.

(b) Congressional recognition, preservation, and protection of primary responsibilities and rights of States

It is the policy of the Congress to recognize, preserve, and protect the primary responsibilities and rights of States to prevent, reduce, and eliminate pollution, to plan the development and use (including restoration, preservation, and enhancement) of land and water resources, and to consult with the Administrator in the exercise of his authority under this chapter. It is the policy of Congress that the States manage the construction grant program under this chapter and implement the permit programs under sections 1342 and 1344 of this title. It is further the policy of the Congress to support and aid research relating to the prevention, reduction, and elimination of pollution and to provide Federal technical services and financial aid to State and interstate agencies and municipalities in connection with the prevention, reduction, and elimination of pollution.

(c) Congressional policy toward Presidential activities with foreign countries

It is further the policy of Congress that the President, acting through the Secretary of State and such national and international organizations as he determines appropriate, shall take such action as may be necessary to insure that to the fullest extent

possible all foreign countries shall take meaningful action for the prevention, reduction, and elimination of pollution in their waters and in international waters and for the achievement of goals regarding the elimination of discharge of pollutants and the improvement of water quality to at least the same extent as the United States does under its laws.

(d) Administrator of Environmental Protection Agency to administer chapter

Except as otherwise expressly provided in this chapter, the Administrator of the Environmental Protection Agency (hereinafter in this chapter called "Administrator") shall administer this chapter.

(e) Public participation in development, revision, and enforcement of any regulation, etc.

Public participation in the development, revision, and enforcement of any regulation, standard, effluent limitation, plan, or program established by the Administrator or any State under this chapter shall be provided for, encouraged, and assisted by the Administrator and the States. The Administrator, in cooperation with the States, shall develop and publish regulations specifying minimum guidelines for public participation in such processes.

(f) Procedures utilized for implementing chapter

It is the national policy that to the maximum extent possible the procedures utilized for implementing this chapter shall encourage the drastic minimization of paperwork and interagency decision procedures, and the best use of available manpower and funds, so as to prevent needless

duplication and unnecessary delays at all levels of government.

(g) Authority of States over water

It is the policy of Congress that the authority of each State to allocate quantities of water within its jurisdiction shall not be superseded, abrogated or otherwise impaired by this chapter. It is the further policy of Congress that nothing in this chapter shall be construed to supersede or abrogate rights to quantities of water which have been established by any State. Federal agencies shall co-operate with State and local agencies to develop comprehensive solutions to prevent, reduce and eliminate pollution in concert with programs for managing water resources.

33 U.S.C. § 1311

(a) Illegality of pollutant discharges except in compliance with law

Except as in compliance with this section and sections 1312, 1316, 1317, 1328, 1342, and 1344 of this title, the discharge of any pollutant by any person shall be unlawful.

(b) Timetable for achievement of objectives

In order to carry out the objective of this chapter there shall be achieved—

(1)

(A) not later than July 1, 1977, effluent limitations for point sources, other than publicly owned treatment works, (i) which shall require the application of the best practicable control technology currently

available as defined by the Administrator pursuant to section 1314(b) of this title, or (ii) in the case of a discharge into a publicly owned treatment works which meets the requirements of subparagraph (B) of this paragraph, which shall require compliance with any applicable pretreatment requirements and any requirements under section 1317 of this title; and

(B) for publicly owned treatment works in existence on July 1, 1977, or approved pursuant to section 1283 of this title prior to June 30, 1974 (for which construction must be completed within four years of approval), effluent limitations based upon secondary treatment as defined by the Administrator pursuant to section 1314(d)(1) of this title; or,

(C) not later than July 1, 1977, any more stringent limitation, including those necessary to meet water quality standards, treatment standards, or schedules of compliance, established pursuant to any State law or regulations (under authority preserved by section 1370 of this title) or any other Federal law or regulation, or required to implement any applicable water quality standard established pursuant to this chapter.

(2)

(A) for pollutants identified in subparagraphs (C), (D), and (F) of this paragraph, effluent limitations for

categories and classes of point sources, other than publicly owned treatment works, which (i) shall require application of the best available technology economically achievable for such category or class, which will result in reasonable further progress toward the national goal of eliminating the discharge of all pollutants, as determined in accordance with regulations issued by the Administrator pursuant to section 1314(b)(2) of this title, which such effluent limitations shall require the elimination of discharges of all pollutants if the Administrator finds, on the basis of information available to him (including information developed pursuant to section 1325 of this title), that such elimination is technologically and economically achievable for a category or class of point sources as determined in accordance with regulations issued by the Administrator pursuant to section 1314(b)(2) of this title, or (ii) in the case of the introduction of a pollutant into a publicly owned treatment works which meets the requirements of subparagraph (B) of this paragraph, shall require compliance with any applicable pretreatment requirements and any other requirement under section 1317 of this title;

(B) Repealed. Pub. L. 97–117, § 21(b), Dec. 29, 1981, 95 Stat. 1632.

(C) with respect to all toxic pollutants referred to in table 1 of Committee Print Numbered 95–30 of the Committee on

Public Works and Transportation of the House of Representatives compliance with effluent limitations in accordance with subparagraph (A) of this paragraph as expeditiously as practicable but in no case later than three years after the date such limitations are promulgated under section 1314(b) of this title, and in no case later than March 31, 1989;

(D) for all toxic pollutants listed under paragraph (1) of subsection (a) of section 1317 of this title which are not referred to in subparagraph (C) of this paragraph compliance with effluent limitations in accordance with subparagraph (A) of this paragraph as expeditiously as practicable, but in no case later than three years after the date such limitations are promulgated under section 1314(b) of this title, and in no case later than March 31, 1989;

(E) as expeditiously as practicable but in no case later than three years after the date such limitations are promulgated under section 1314(b) of this title, and in no case later than March 31, 1989, compliance with effluent limitations for categories and classes of point sources, other than publicly owned treatment works, which in the case of pollutants identified pursuant to section 1314(a)(4) of this title shall require application of the best conventional pollutant control technology as determined in accordance with regulations issued by the

Administrator pursuant to section 1314(b)(4) of this title; and

(F) for all pollutants (other than those subject to subparagraphs (C), (D), or (E) of this paragraph) compliance with effluent limitations in accordance with subparagraph (A) of this paragraph as expeditiously as practicable but in no case later than 3 years after the date such limitations are established, and in no case later than March 31, 1989.

(3)

(A) for effluent limitations under paragraph (1)(A)(i) of this subsection promulgated after January 1, 1982, and requiring a level of control substantially greater or based on fundamentally different control technology than under permits for an industrial category issued before such date, compliance as expeditiously as practicable but in no case later than three years after the date such limitations are promulgated under section 1314(b) of this title, and in no case later than March 31, 1989; and

(B) for any effluent limitation in accordance with paragraph (1)(A)(i), (2)(A)(i), or (2)(E) of this subsection established only on the basis of section 1342(a)(1) of this title in a permit issued after February 4, 1987, compliance as expeditiously as practicable but in no case later than three years after the date such limitations are established, and in no case later than March 31, 1989.

(c) Modification of timetable

The Administrator may modify the requirements of subsection (b)(2)(A) of this section with respect to any point source for which a permit application is filed after July 1, 1977, upon a showing by the owner or operator of such point source satisfactory to the Administrator that such modified requirements (1) will represent the maximum use of technology within the economic capability of the owner or operator; and (2) will result in reasonable further progress toward the elimination of the discharge of pollutants.

(d) Review and revision of effluent limitations

Any effluent limitation required by paragraph (2) of subsection (b) of this section shall be reviewed at least every five years and, if appropriate, revised pursuant to the procedure established under such paragraph.

(e) All point discharge source application of effluent limitations

Effluent limitations established pursuant to this section or section 1312 of this title shall be applied to all point sources of discharge of pollutants in accordance with the provisions of this chapter.

(f) Illegality of discharge of radiological, chemical, or biological warfare agents, high-level radioactive waste, or medical waste

Notwithstanding any other provisions of this chapter it shall be unlawful to discharge any radiological,

chemical, or biological warfare agent, any high-level radioactive waste, or any medical waste, into the navigable waters.

(g) Modifications for certain nonconventional pollutants

(1) General authority

The Administrator, with the concurrence of the State, may modify the requirements of subsection (b)(2)(A) of this section with respect to the discharge from any point source of ammonia, chlorine, color, iron, and total phenols (4AAP) (when determined by the Administrator to be a pollutant covered by subsection (b)(2)(F)) and any other pollutant which the Administrator lists under paragraph (4) of this subsection.

(2) Requirements for granting modifications

A modification under this subsection shall be granted only upon a showing by the owner or operator of a point source satisfactory to the Administrator that—

(A) such modified requirements will result at a minimum in compliance with the requirements of subsection (b)(1)(A) or (C) of this section, whichever is applicable;

(B) such modified requirements will not result in any additional requirements on any other point or nonpoint source; and

(C) such modification will not interfere with the attainment or maintenance of that water quality which shall assure protection of public water supplies, and the protection and propagation of a balanced population of shellfish, fish, and wildlife, and allow recreational activities, in and on the water and such modification will not result in the discharge of pollutants in quantities which may reasonably be anticipated to pose an unacceptable risk to human health or the environment because of bioaccumulation, persistency in the environment, acute toxicity, chronic toxicity (including carcinogenicity, mutagenicity or teratogenicity), or synergistic propensities.

(3) Limitation on authority to apply for subsection (c) modification

If an owner or operator of a point source applies for a modification under this subsection with respect to the discharge of any pollutant, such owner or operator shall be eligible to apply for modification under subsection (c) of this section with respect to such pollutant only during the same time period as he is eligible to apply for a modification under this subsection.

(4) Procedures for listing additional pollutants

(A) General authority

Upon petition of any person, the Administrator may add any pollutant to the list of pollutants for which modification under this section is authorized (except for

pollutants identified pursuant to section 1314(a)(4) of this title, toxic pollutants subject to section 1317(a) of this title, and the thermal component of discharges) in accordance with the provisions of this paragraph.

(B) Requirements for listing

(i) Sufficient information

The person petitioning for listing of an additional pollutant under this subsection shall submit to the Administrator sufficient information to make the determinations required by this subparagraph.

(ii) Toxic criteria determination

The Administrator shall determine whether or not the pollutant meets the criteria for listing as a toxic pollutant under section 1317(a) of this title.

(iii) Listing as toxic pollutant

If the Administrator determines that the pollutant meets the criteria for listing as a toxic pollutant under section 1317(a) of this title, the Administrator shall list the pollutant as a toxic pollutant under section 1317(a) of this title.

(iv) Nonconventional criteria determination

If the Administrator determines that the pollutant does not meet the criteria for listing as a toxic pollutant under such section and determines that adequate test methods and sufficient data are available to make the determinations required by paragraph (2) of this subsection with respect to the pollutant, the Administrator shall add the pollutant to the list of pollutants specified in paragraph (1) of this subsection for which modifications are authorized under this subsection.

(C) Requirements for filing of petitions
A petition for listing of a pollutant under this paragraph—

(i) must be filed not later than 270 days after the date of promulgation of an applicable effluent guideline under section 1314 of this title;

(ii) may be filed before promulgation of such guideline; and

(iii) may be filed with an application for a modification under paragraph (1) with respect to the discharge of such pollutant.

(D) Deadline for approval of petition

A decision to add a pollutant to the list of pollutants for which modifications under this subsection are authorized must be made within 270 days after the date of promulgation of an applicable effluent guideline under section 1314 of this title.

(E) Burden of proof

The burden of proof for making the determinations under subparagraph (B) shall be on the petitioner.

(5) Removal of pollutants

The Administrator may remove any pollutant from the list of pollutants for which modifications are authorized under this subsection if the Administrator determines that adequate test methods and sufficient data are no longer available for determining whether or not modifications may be granted with respect to such pollutant under paragraph (2) of this subsection.

(h) Modification of secondary treatment requirements

The Administrator, with the concurrence of the State, may issue a permit under section 1342 of this title which modifies the requirements of subsection (b)(1)(B) of this section with respect to the discharge of any pollutant from a publicly owned treatment works into marine waters, if the applicant

demonstrates to the satisfaction of the Administrator that—

(1) there is an applicable water quality standard specific to the pollutant for which the modification is requested, which has been identified under section 1314(a)(6) of this title;

(2) the discharge of pollutants in accordance with such modified requirements will not interfere, alone or in combination with pollutants from other sources, with the attainment or maintenance of that water quality which assures protection of public water supplies and the protection and propagation of a balanced, indigenous population of shellfish, fish, and wildlife, and allows recreational activities, in and on the water;

(3) the applicant has established a system for monitoring the impact of such discharge on a representative sample of aquatic biota, to the extent practicable, and the scope of such monitoring is limited to include only those scientific investigations which are necessary to study the effects of the proposed discharge;

(4) such modified requirements will not result in any additional requirements on any other point or nonpoint source;

(5) all applicable pretreatment requirements for sources introducing waste into such treatment works will be enforced;

(6) in the case of any treatment works serving a population of 50,000 or more, with respect to any toxic pollutant introduced into such works by an industrial discharger for which pollutant

there is no applicable pretreatment requirement in effect, sources introducing waste into such works are in compliance with all applicable pretreatment requirements, the applicant will enforce such requirements, and the applicant has in effect a pretreatment program which, in combination with the treatment of discharges from such works, removes the same amount of such pollutant as would be removed if such works were to apply secondary treatment to discharges and if such works had no pretreatment program with respect to such pollutant;

(7) to the extent practicable, the applicant has established a schedule of activities designed to eliminate the entrance of toxic pollutants from nonindustrial sources into such treatment works;

(8) there will be no new or substantially increased discharges from the point source of the pollutant to which the modification applies above that volume of discharge specified in the permit;

(9) the applicant at the time such modification becomes effective will be discharging effluent which has received at least primary or equivalent treatment and which meets the criteria established under section 1314(a)(1) of this title after initial mixing in the waters surrounding or adjacent to the point at which such effluent is discharged.

For the purposes of this subsection the phrase "the discharge of any pollutant into

marine waters" refers to a discharge into deep waters of the territorial sea or the waters of the contiguous zone, or into saline estuarine waters where there is strong tidal movement and other hydrological and geological characteristics which the Administrator determines necessary to allow compliance with paragraph (2) of this subsection, and section 1251(a)(2) of this title. For the purposes of paragraph (9), "primary or equivalent treatment" means treatment by screening, sedimentation, and skimming adequate to remove at least 30 percent of the biological oxygen demanding material and of the suspended solids in the treatment works influent, and disinfection, where appropriate. A municipality which applies secondary treatment shall be eligible to receive a permit pursuant to this subsection which modifies the requirements of subsection (b)(1)(B) of this section with respect to the discharge of any pollutant from any treatment works owned by such municipality into marine waters. No permit issued under this subsection shall authorize the discharge of sewage sludge into marine waters. In order for a permit to be issued under this subsection for the discharge of a pollutant into marine waters, such marine waters must exhibit characteristics assuring that water providing dilution does not contain significant amounts of previously discharged effluent from such treatment

works. No permit issued under this subsection shall authorize the discharge of any pollutant into saline estuarine waters which at the time of application do not support a balanced indigenous population of shellfish, fish and wildlife, or allow recreation in and on the waters or which exhibit ambient water quality below applicable water quality standards adopted for the protection of public water supplies, shellfish, fish and wildlife or recreational activities or such other standards necessary to assure support and protection of such uses. The prohibition contained in the preceding sentence shall apply without regard to the presence or absence of a causal relationship between such characteristics and the applicant's current or proposed discharge. Notwithstanding any other provisions of this subsection, no permit may be issued under this subsection for discharge of a pollutant into the New York Bight Apex consisting of the ocean waters of the Atlantic Ocean westward of 73 degrees 30 minutes west longitude and northward of 40 degrees 10 minutes north latitude.

(i) Municipal time extensions

(1) Where construction is required in order for a planned or existing publicly owned treatment works to achieve limitations under subsection (b)(1)(B) or (b)(1)(C) of this section, but (A) construction cannot be completed within the time required in such subsection, or (B) the

United States has failed to make financial assistance under this chapter available in time to achieve such limitations by the time specified in such subsection, the owner or operator of such treatment works may request the Administrator (or if appropriate the State) to issue a permit pursuant to section 1342 of this title or to modify a permit issued pursuant to that section to extend such time for compliance. Any such request shall be filed with the Administrator (or if appropriate the State) within 180 days after February 4, 1987. The Administrator (or if appropriate the State) may grant such request and issue or modify such a permit, which shall contain a schedule of compliance for the publicly owned treatment works based on the earliest date by which such financial assistance will be available from the United States and construction can be completed, but in no event later than July 1, 1988, and shall contain such other terms and conditions, including those necessary to carry out subsections (b) through (g) of section 1281 of this title, section 1317 of this title, and such interim effluent limitations applicable to that treatment works as the Administrator determines are necessary to carry out the provisions of this chapter.

(2)

(A) Where a point source (other than a publicly owned treatment works) will not achieve the requirements of subsections (b)(1)(A) and (b)(1)(C) of this section and—

(i) if a permit issued prior to July 1, 1977, to such point source is based upon a discharge into a publicly owned treatment works; or

(ii) if such point source (other than a publicly owned treatment works) had before July 1, 1977, a contract (enforceable against such point source) to discharge into a publicly owned treatment works; or

(iii) if either an application made before July 1, 1977, for a construction grant under this chapter for a publicly owned treatment works, or engineering or architectural plans or working drawings made before July 1, 1977, for a publicly owned treatment works, show that such point source was to discharge into such publicly owned treatment works,

and such publicly owned treatment works is presently unable to accept such discharge without construction, and in the case of a discharge to an existing publicly owned treatment works, such treatment works has an extension pursuant to paragraph (1) of this subsection, the owner or operator of such point source may request the Administrator (or if appropriate the State) to issue or modify such a permit pursuant to such section 1342 of this title to extend such time for compliance. Any such request shall be filed with the

Administrator (or if appropriate the State) within 180 days after December 27, 1977, or the filing of a request by the appropriate publicly owned treatment works under paragraph (1) of this subsection, whichever is later. If the Administrator (or if appropriate the State) finds that the owner or operator of such point source has acted in good faith, he may grant such request and issue or modify such a permit, which shall contain a schedule of compliance for the point source to achieve the requirements of subsections (b)(1)(A) and (C) of this section and shall contain such other terms and conditions, including pretreatment and interim effluent limitations and water conservation requirements applicable to that point source, as the Administrator determines are necessary to carry out the provisions of this chapter.

(B) No time modification granted by the Administrator (or if appropriate the State) pursuant to paragraph (2)(A) of this subsection shall extend beyond the earliest date practicable for compliance or beyond the date of any extension granted to the appropriate publicly owned treatment works pursuant to paragraph (1) of this subsection, but in no event shall it extend beyond July 1, 1988; and no such time modification shall be granted unless (i) the

publicly owned treatment works will be in operation and available to the point source before July 1, 1988, and will meet the requirements of subsections (b)(1)(B) and (C) of this section after receiving the discharge from that point source; and (ii) the point source and the publicly owned treatment works have entered into an enforceable contract requiring the point source to discharge into the publicly owned treatment works, the owner or operator of such point source to pay the costs required under section 1284 of this title, and the publicly owned treatment works to accept the discharge from the point source; and (iii) the permit for such point source requires that point source to meet all requirements under section 1317(a) and (b) of this title during the period of such time modification.

(j) Modification procedures

(1) Any application filed under this section for a modification of the provisions of—

(A) subsection (b)(1)(B) under subsection (h) of this section shall be filed not later that [1] the 365th day which begins after December 29, 1981, except that a publicly owned treatment works which prior to December 31, 1982, had a contractual arrangement to use a portion of the capacity of an ocean outfall operated by another publicly owned treatment works which has applied for or received modification under subsection (h), may apply for a modification of subsection (h) in its own right not later than 30 days

after February 4, 1987, and except as provided in paragraph (5);

(B) subsection (b)(2)(A) as it applies to pollutants identified in subsection (b)(2)(F) shall be filed not later than 270 days after the date of promulgation of an applicable effluent guideline under section 1314 of this title or not later than 270 days after December 27, 1977, whichever is later.

(2) Subject to paragraph (3) of this section, any application for a modification filed under subsection (g) of this section shall not operate to stay any requirement under this chapter, unless in the judgment of the Administrator such a stay or the modification sought will not result in the discharge of pollutants in quantities which may reasonably be anticipated to pose an unacceptable risk to human health or the environment because of bioaccumulation, persistency in the environment, acute toxicity, chronic toxicity (including carcinogenic-ity, mutagenicity, or teratogenicity), or synergistic propensities, and that there is a substantial likelihood that the applicant will succeed on the merits of such application. In the case of an application filed under subsection (g) of this section, the Administrator may condition any stay granted under this paragraph on requiring the filing of a bond or other appropriate security to assure timely compliance with the requirements from which a modification is sought.

(3) Compliance requirements under subsection (g).—

(A) Effect of filing.—

An application for a modification under subsection (g) and a petition for listing of a pollutant as a pollutant for which modifications are authorized under such subsection shall not stay the requirement that the person seeking such modification or listing comply with effluent limitations under this chapter for all pollutants not the subject of such application or petition.

(B) Effect of disapproval.—

Disapproval of an application for a modification under subsection (g) shall not stay the requirement that the person seeking such modification comply with all applicable effluent limitations under this chapter.

(4) Deadline for subsection (g) decision.—

An application for a modification with respect to a pollutant filed under subsection (g) must be approved or disapproved not later than 365 days after the date of such filing; except that in any case in which a petition for listing such pollutant as a pollutant for which modifications are authorized under such subsection is approved, such application must be approved or disapproved not later than 365 days after the date of approval of such petition.

(5) Extension of application deadline.—

(A) In general.—

In the 180-day period beginning on October 31, 1994, the city of San Diego, California, may apply for a modification pursuant to subsection (h) of the requirements of subsection (b)(1)(B) with respect to biological oxygen demand and total suspended solids in the effluent discharged into marine waters.

(B) Application.—

An application under this paragraph shall include a commitment by the applicant to implement a waste water reclamation program that, at a minimum, will—

(i) achieve a system capacity of 45,000,000 gallons of reclaimed waste water per day by January 1, 2010; and

(ii) result in a reduction in the quantity of suspended solids discharged by the applicant into the marine environment during the period of the modification.

(C) Additional conditions.—

The Administrator may not grant a modification pursuant to an application submitted under this paragraph unless the Administrator determines that such modification will result in removal of not less than 58 percent of the biological oxygen demand (on an annual average) and not less than 80 percent of total suspended solids (on a monthly average) in the discharge to which the application applies.

(D) Preliminary decision deadline.—

The Administrator shall announce a preliminary decision on an application submitted under this paragraph not later than 1 year after the date the application is submitted.

(k) Innovative technology

In the case of any facility subject to a permit under section 1342 of this title which proposes to comply with the requirements of subsection (b)(2)(A) or (b)(2)(E) of this section by replacing existing production capacity with an innovative production process which will result in an effluent reduction significantly greater than that required by the limitation otherwise applicable to such facility and moves toward the national goal of eliminating the discharge of all pollutants, or with the installation of an innovative control technique that has a substantial likelihood for enabling the facility to comply with the applicable effluent limitation by achieving a significantly greater effluent reduction than that required by the applicable effluent limitation and moves toward the national goal of eliminating the discharge of all pollutants, or by achieving the required reduction with an innovative system that has the potential for significantly lower costs than the systems which have been determined by the Administrator to be economically achievable, the Administrator (or the State with an approved program under section 1342 of this title, in consultation with the Administrator) may establish a date for compliance under subsection (b)(2)(A) or (b)(2)(E) of this section no later than two years after the date for compliance with such effluent limitation which would otherwise be applicable under such subsection, if it is also determined that such

innovative system has the potential for industrywide application.

(l) Toxic pollutants

Other than as provided in subsection (n) of this section, the Administrator may not modify any requirement of this section as it applies to any specific pollutant which is on the toxic pollutant list under section 1317(a)(1) of this title.

(m) Modification of effluent limitation requirements for point sources

(1) The Administrator, with the concurrence of the State, may issue a permit under section 1342 of this title which modifies the requirements of subsections (b)(1)(A) and (b)(2)(E) of this section, and of section 1343 of this title, with respect to effluent limitations to the extent such limitations relate to biochemical oxygen demand and pH from discharges by an industrial discharger in such State into deep waters of the territorial seas, if the applicant demonstrates and the Administrator finds that—

(A) the facility for which modification is sought is covered at the time of the enactment of this subsection by National Pollutant Discharge Elimination System permit number CA0005894 or CA0005282;

(B) the energy and environmental costs of meeting such requirements of subsections (b)(1)(A) and (b)(2)(E) and section 1343 of this title exceed by an unreasonable amount the benefits to be obtained, including the objectives of this chapter;

(C) the applicant has established a system for monitoring the impact of such discharges on a representative sample of aquatic biota;

(D) such modified requirements will not result in any additional requirements on any other point or nonpoint source;

(E) there will be no new or substantially increased discharges from the point source of the pollutant to which the modification applies above that volume of discharge specified in the permit;

(F) the discharge is into waters where there is strong tidal movement and other hydrological and geological characteristics which are necessary to allow compliance with this subsection and section 1251(a)(2) of this title;

(G) the applicant accepts as a condition to the permit a contractural [2] obligation to use funds in the amount required (but not less than $250,000 per year for ten years) for research and development of water pollution control technology, including but not limited to closed cycle technology;

(H) the facts and circumstances present a unique situation which, if relief is granted, will not establish a precedent or the relaxation of the requirements of this chapter applicable to similarly situated discharges; and

(I) no owner or operator of a facility comparable to that of the applicant situated in the United States has demonstrated that

it would be put at a competitive disadvantage to the applicant (or the parent company or any subsidiary thereof) as a result of the issuance of a permit under this subsection.

(2) The effluent limitations established under a permit issued under paragraph (1) shall be sufficient to implement the applicable State water quality standards, to assure the protection of public water supplies and protection and propagation of a balanced, indigenous population of shellfish, fish, fauna, wildlife, and other aquatic organisms, and to allow recreational activities in and on the water. In setting such limitations, the Administrator shall take into account any seasonal variations and the need for an adequate margin of safety, considering the lack of essential knowledge concerning the relationship between effluent limitations and water quality and the lack of essential knowledge of the effects of discharges on beneficial uses of the receiving waters.

(3) A permit under this subsection may be issued for a period not to exceed five years, and such a permit may be renewed for one additional period not to exceed five years upon a demonstration by the applicant and a finding by the Administrator at the time of application for any such renewal that the provisions of this subsection are met.

(4) The Administrator may terminate a permit issued under this subsection if the Administrator determines that there has been a decline in ambient water quality of the receiving waters during the period of the permit even if a

direct cause and effect relationship cannot be shown: Provided, That if the effluent from a source with a permit issued under this subsection is contributing to a decline in ambient water quality of the receiving waters, the Administrator shall terminate such permit.

(n) Fundamentally different factors

(1) General rule

The Administrator, with the concurrence of the State, may establish an alternative requirement under subsection (b)(2) or section 1317(b) of this title for a facility that modifies the requirements of national effluent limitation guidelines or categorical pretreatment standards that would otherwise be applicable to such facility, if the owner or operator of such facility demonstrates to the satisfaction of the Administrator that—

(A) the facility is fundamentally different with respect to the factors (other than cost) specified in section 1314(b) or 1314(g) of this title and considered by the Administrator in establishing such national effluent limitation guidelines or categorical pretreatment standards;

(B) the application—

(i) is based solely on information and supporting data submitted to the Administrator during the rulemaking for establishment of the applicable national effluent limitation guidelines or categorical pretreatment standard specifically raising the factors that are

fundamentally different for such facility; or

(ii) is based on information and supporting data referred to in clause (i) and information and supporting data the applicant did not have a reasonable opportunity to submit during such rulemaking;

(C) the alternative requirement is no less stringent than justified by the fundamental difference; and

(D) the alternative requirement will not result in a non-water quality environmental impact which is markedly more adverse than the impact considered by the Administrator in establishing such national effluent limitation guideline or categorical pretreatment standard.

(2) Time limit for applications

An application for an alternative requirement which modifies the requirements of an effluent limitation or pretreatment standard under this subsection must be submitted to the Administrator within 180 days after the date on which such limitation or standard is established or revised, as the case may be.

(3) Time limit for decision

The Administrator shall approve or deny by final agency action an application submitted under this subsection within 180 days after the

date such application is filed with the Administrator.

(4) Submission of information

The Administrator may allow an applicant under this subsection to submit information and supporting data until the earlier of the date the application is approved or denied or the last day that the Administrator has to approve or deny such application.

(5) Treatment of pending applications

For the purposes of this subsection, an application for an alternative requirement based on fundamentally different factors which is pending on February 4, 1987, shall be treated as having been submitted to the Administrator on the 180th day following February 4, 1987. The applicant may amend the application to take into account the provisions of this subsection.

(6) Effect of submission of application

An application for an alternative requirement under this subsection shall not stay the applicant's obligation to comply with the effluent limitation guideline or categorical pretreatment standard which is the subject of the application.

(7) Effect of denial

If an application for an alternative requirement which modifies the requirements of an effluent limitation or pretreatment standard under this subsection is denied by the Administrator, the applicant must comply with such limitation or standard as established or revised, as the case may be.

(8) Reports

By January 1, 1997, and January 1 of every odd-numbered year thereafter, the Administrator shall submit to the Committee on Environment and Public Works of the Senate and the Committee on Transportation and Infrastructure of the House of Representatives a report on the status of applications for alternative requirements which modify the requirements of effluent limitations under section 1311 or 1314 of this title or any national categorical pretreatment standard under section 1317(b) of this title filed before, on, or after February 4, 1987.

(o) Application fees

The Administrator shall prescribe and collect from each applicant fees reflecting the reasonable administrative costs incurred in reviewing and processing applications for modifications submitted to the Administrator pursuant to subsections (c), (g), (i), (k), (m), and (n) of this section, section 1314(d)(4) of this title, and section 1326(a) of this title. All

amounts collected by the Administrator under this subsection shall be deposited into a special fund of the Treasury entitled "Water Permits and Related Services" which shall thereafter be available for appropriation to carry out activities of the Environmental Protection Agency for which such fees were collected.

(p) Modified permit for coal remining operations

(1) In general

Subject to paragraphs (2) through (4) of this subsection, the Administrator, or the State in any case which the State has an approved permit program under section 1342(b) of this title, may issue a permit under section 1342 of this title which modifies the requirements of subsection (b)(2)(A) of this section with respect to the pH level of any pre-existing discharge, and with respect to pre-existing discharges of iron and manganese from the remined area of any coal remining operation or with respect to the pH level or level of iron or manganese in any pre-existing discharge affected by the remining operation. Such modified requirements shall apply the best available technology economically achievable on a case-by-case basis, using best professional judgment, to set specific numerical effluent limitations in each permit.

(2) Limitations

The Administrator or the State may only issue a permit pursuant to paragraph (1) if the applicant demonstrates to the satisfaction of the Administrator or the State, as the case may be, that the coal remining operation will result in the potential for improved water quality from the remining operation but in no event shall such a permit allow the pH level of any discharge, and in no event shall such a permit allow the discharges of iron and manganese, to exceed the levels being discharged from the remined area before the coal remining operation begins. No discharge from, or affected by, the remining operation shall exceed State water quality standards established under section 1313 of this title.

(3) Definitions

For purposes of this subsection—

(A) Coal remining operation

The term "coal remining operation" means a coal mining operation which begins after February 4, 1987 at a site on which coal mining was conducted before August 3, 1977.

(B) Remined area

The term "remined area" means only that area of any coal remining operation on

which coal mining was conducted before August 3, 1977.

(C) Pre-existing discharge

The term "pre-existing discharge" means any discharge at the time of permit application under this subsection.

(4) Applicability of strip mining laws

Nothing in this subsection shall affect the application of the Surface Mining Control and Reclamation Act of 1977 [30 U.S.C. 1201 et seq.] to any coal remining operation, including the application of such Act to suspended solids.

33 U.S.C. § 1362

Except as otherwise specifically provided, when used in this chapter:

(1) The term "State water pollution control agency" means the State agency designated by the Governor having responsibility for enforcing State laws relating to the abatement of pollution.

(2) The term "interstate agency" means an agency of two or more States established by or pursuant to an agreement or compact approved by the Congress, or any other agency of two or more States, having substantial powers or duties pertaining to the control of pollution as determined and approved by the Administrator.

(3) The term "State" means a State, the District of Columbia, the Commonwealth of Puerto Rico, the Virgin Islands, Guam, American Samoa, the Commonwealth of the Northern Mariana Islands, and the Trust Territory of the Pacific Islands.

(4) The term "municipality" means a city, town, borough, county, parish, district, association, or other public body created by or pursuant to State law and having jurisdiction over disposal of sewage, industrial wastes, or other wastes, or an Indian tribe or an authorized Indian tribal organization, or a designated and approved management agency under section 1288 of this title.

(5) The term "person" means an individual, corporation, partnership, association, State, municipality, commission, or political subdivision of a State, or any interstate body.

(6) The term "pollutant" means dredged spoil, solid waste, incinerator residue, sewage, garbage, sewage sludge, munitions, chemical wastes, biological materials, radioactive materials, heat, wrecked or discarded equipment, rock, sand, cellar dirt and industrial, municipal, and agricultural waste discharged into water. This term does not mean (A) "sewage from vessels or a discharge incidental to the normal operation of a vessel of the Armed Forces" within the meaning of section 1322 of this title; or (B) water, gas, or other material which is injected into a well to facilitate production of oil or gas, or water derived in association with oil or gas production and disposed of in a well, if the well used either to

facilitate production or for disposal purposes is approved by authority of the State in which the well is located, and if such State determines that such injection or disposal will not result in the degradation of ground or surface water resources.

(7) The term "navigable waters" means the waters of the United States, including the territorial seas.

(8) The term "territorial seas" means the belt of the seas measured from the line of ordinary low water along that portion of the coast which is in direct contact with the open sea and the line marking the seaward limit of inland waters, and extending seaward a distance of three miles.

(9) The term "contiguous zone" means the entire zone established or to be established by the United States under article 24 of the Convention of the Territorial Sea and the Contiguous Zone.

(10) The term "ocean" means any portion of the high seas beyond the contiguous zone.

(11) The term "effluent limitation" means any restriction established by a State or the Administrator on quantities, rates, and concentrations of chemical, physical, biological, and other constituents which are discharged from point sources into navigable waters, the waters of the contiguous zone, or the ocean, including schedules of compliance.

(12) The term "discharge of a pollutant" and the term "discharge of pollutants" each means (A) any

addition of any pollutant to navigable waters from any point source, (B) any addition of any pollutant to the waters of the contiguous zone or the ocean from any point source other than a vessel or other floating craft.

(13) The term "toxic pollutant" means those pollutants, or combinations of pollutants, including disease-causing agents, which after discharge and upon exposure, ingestion, inhalation or assimilation into any organism, either directly from the environment or indirectly by ingestion through food chains, will, on the basis of information available to the Administrator, cause death, disease, behavioral abnormalities, cancer, genetic mutations, physiological malfunctions (including malfunctions in reproduction) or physical deformations, in such organisms or their offspring.

(14) The term "point source" means any discernible, confined and discrete conveyance, including but not limited to any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, or vessel or other floating craft, from which pollutants are or may be discharged. This term does not include agricultural stormwater discharges and return flows from irrigated agriculture.

(15) The term "biological monitoring" shall mean the determination of the effects on aquatic life, including accumulation of pollutants in tissue, in receiving waters due to the discharge of pollutants (A) by techniques and procedures,

including sampling of organisms representative of appropriate levels of the food chain appropriate to the volume and the physical, chemical, and biological characteristics of the effluent, and (B) at appropriate frequencies and locations.

(16) The term "discharge" when used without qualification includes a discharge of a pollutant, and a discharge of pollutants.

(17) The term "schedule of compliance" means a schedule of remedial measures including an enforceable sequence of actions or operations leading to compliance with an effluent limitation, other limitation, prohibition, or standard.

(18) The term "industrial user" means those industries identified in the Standard Industrial Classification Manual, Bureau of the Budget, 1967, as amended and supplemented, under the category of "Division D—Manufacturing" and such other classes of significant waste producers as, by regulation, the Administrator deems appropriate.

(19) The term "pollution" means the man-made or man-induced alteration of the chemical, physical, biological, and radiological integrity of water.

(20) The term "medical waste" means isolation wastes; infectious agents; human blood and blood products; pathological wastes; sharps; body parts; contaminated bedding; surgical wastes and potentially contaminated laboratory wastes; dialysis wastes; and such additional medical items as the Administrator shall prescribe by regulation.

(21) Coastal recreation waters.—

(A) In general.—The term "coastal recreation waters" means—

(i) the Great Lakes; and

(ii) marine coastal waters (including coastal estuaries) that are designated under section 1313(c) of this title by a State for use for swimming, bathing, surfing, or similar water contact activities.

(B) Exclusions.—The term "coastal recreation waters" does not include—

(i) inland waters; or

(ii) waters upstream of the mouth of a river or stream having an unimpaired natural connection with the open sea.

(22) Floatable material.—

(A) In general.—

The term "floatable material" means any foreign matter that may float or remain suspended in the water column.

(B) Inclusions.— The term "floatable material" includes—

(i) plastic;

(ii) aluminum cans;

(iii) wood products;

(iv) bottles; and

(v) paper products.

(23) Pathogen indicator.—

The term "pathogen indicator" means a substance that indicates the potential for human infectious disease.

(24) Oil and gas exploration and production.—
The term "oil and gas exploration, production, processing, or treatment operations or transmission facilities" means all field activities or operations associated with exploration, production, processing, or treatment operations, or transmission facilities, including activities necessary to prepare a site for drilling and for the movement and placement of drilling equipment, whether or not such field activities or operations may be considered to be construction activities.

(25) Recreational vessel.—

(A) In general.—The term "recreational vessel" means any vessel that is—

(i) manufactured or used primarily for pleasure; or

(ii) leased, rented, or chartered to a person for the pleasure of that person.

(B) Exclusion.—The term "recreational vessel" does not include a vessel that is subject to Coast Guard inspection and that—

(i) is engaged in commercial use; or

(ii) carries paying passengers.

(26) Treatment works.—
The term "treatment works" has the meaning given the term in section 1292 of this title.

(27) Green infrastructure.—
The term "green infrastructure" means the range of measures that use plant or soil systems, permeable pavement or other permeable surfaces or substrates, stormwater harvest and reuse, or landscaping to

store, infiltrate, or evapotranspirate stormwater and reduce flows to sewer systems or to surface waters.

33 U.S.C. § 1365

(a) Authorization; jurisdiction

Except as provided in subsection (b) of this section and section 1319(g)(6) of this title, any citizen may commence a civil action on his own behalf—

> (1) against any person (including (i) the United States, and (ii) any other governmental instrumentality or agency to the extent permitted by the eleventh amendment to the Constitution) who is alleged to be in violation of (A) an effluent standard or limitation under this chapter or (B) an order issued by the Administrator or a State with respect to such a standard or limitation, or
>
> (2) against the Administrator where there is alleged a failure of the Administrator to perform any act or duty under this chapter which is not discretionary with the Administrator.
>
> The district courts shall have jurisdiction, without regard to the amount in controversy or the citizenship of the parties, to enforce such an effluent standard or limitation, or such an order, or to order the Administrator to perform such act or duty, as the case may be, and to apply any appropriate civil penalties under section 1319(d) of this title.

(b) Notice

No action may be commenced—

(1) under subsection (a)(1) of this section—

(A) prior to sixty days after the plaintiff has given notice of the alleged violation (i) to the Administrator, (ii) to the State in which the alleged violation occurs, and (iii) to any alleged violator of the standard, limitation, or order, or

(B) if the Administrator or State has commenced and is diligently prosecuting a civil or criminal action in a court of the United States, or a State to require compliance with the standard, limitation, or order, but in any such action in a court of the United States any citizen may intervene as a matter of right.

(2) under subsection (a)(2) of this section prior to sixty days after the plaintiff has given notice of such action to the Administrator,

except that such action may be brought immediately after such notification in the case of an action under this section respecting a violation of sections 1316 and 1317(a) of this title. Notice under this subsection shall be given in such manner as the Administrator shall prescribe by regulation.

(c) Venue; intervention by Administrator; United States interests protected

(1) Any action respecting a violation by a discharge source of an effluent standard or limitation or an order respecting such standard or limitation may be brought under this section only in the judicial district in which such source is located.

(2) In such action under this section, the Administrator, if not a party, may intervene as a matter of right.

(3) Protection of interests of United States.—

Whenever any action is brought under this section in a court of the United States, the plaintiff shall serve a copy of the complaint on the Attorney General and the Administrator. No consent judgment shall be entered in an action in which the United States is not a party prior to 45 days following the receipt of a copy of the proposed consent judgment by the Attorney General and the Administrator.

(d) Litigation costs

The court, in issuing any final order in any action brought pursuant to this section, may award costs of litigation (including reasonable attorney and expert witness fees) to any prevailing or substantially prevailing party, whenever the court determines such award is appropriate. The court may, if a temporary restraining order or preliminary injunction is sought, require the filing of a bond or equivalent security in accordance with the Federal Rules of Civil Procedure.

(e) Statutory or common law rights not restricted

Nothing in this section shall restrict any right which any person (or class of persons) may have under any statute or common law to seek enforcement of any effluent standard or limitation or to seek any other relief (including relief against the Administrator or a State agency).

(f) Effluent standard or limitation

For purposes of this section, the term "effluent standard or limitation under this chapter" means (1) effective July 1, 1973, an unlawful act under subsection (a) of section 1311 of this title; (2) an effluent limitation or other limitation under section 1311 or 1312 of this title; (3) standard of performance under section 1316 of this title; (4) prohibition, effluent standard or pretreatment standards under section 1317 of this title; (5) a standard of performance or requirement under section 1322(p) of this title; (6) a certification under section 1341 of this title; (7) a permit or condition of a permit issued under section 1342 of this title that is in effect under this chapter (including a requirement applicable by reason of section 1323 of this title); or (8) a regulation under section 1345(d) of this title.

(g) "Citizen" defined

For the purposes of this section the term "citizen" means a person or persons having an interest which is or may be adversely affected.

(h) Civil action by State Governors

A Governor of a State may commence a civil action under subsection (a), without regard to the limitations of subsection (b) of this section, against the Administrator where there is alleged a failure of the Administrator to enforce an effluent standard or limitation under this chapter the violation of which is occurring in another State and is causing an adverse effect on the public health or welfare in his State, or is causing a violation of any water quality requirement in his State.