SOUTHERN ENVIRONMENTAL LAW CENTER

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March 9, 2016

Ms. Ashley R. Farless, PE, AICP
NEPA Compliance
Tennessee Valley Authority
1101 Market Street
Chattanooga, TN 37402

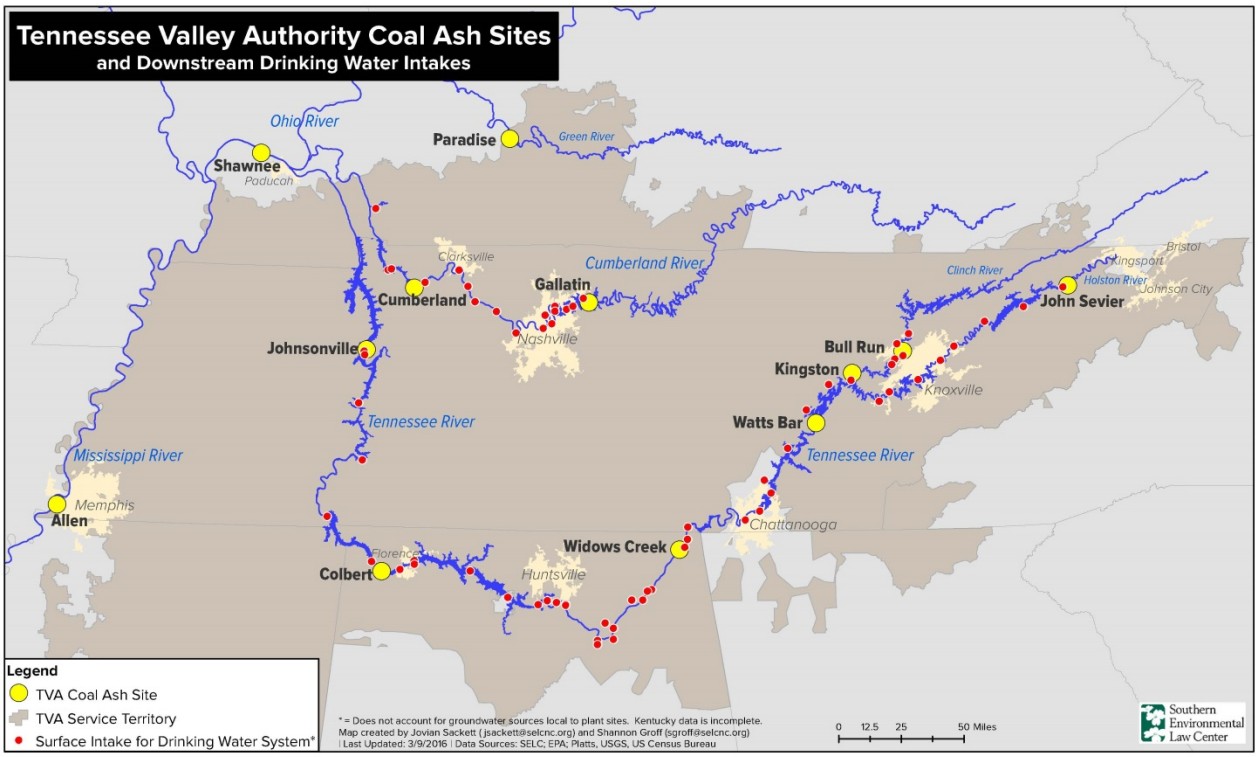
Re: Draft Ash Impoundment Closure Environmental Impact Statement, Part I - Programmatic NEPA Review, and Part II, Site-Specific NEPA Review (December 2015)

Dear Ms. Farless:

The undersigned groups are writing to provide comments on TVA's proposal to cover up millions of tons of coal ash in unlined pits in or adjacent to rivers in Alabama, Tennessee and Kentucky.

Coal ash contains toxic pollutants, including heavy metals such as arsenic, boron and selenium. If coal ash is not managed properly, these toxic pollutants can contaminate groundwater and surface water, either by catastrophic failure of dikes or berms, by seeping from berms into surface water, or by percolating into groundwater, which then flows into surface water. Humans and other organisms that consume or come into contact with these toxic heavy metals are at risk of developing cancers and other adverse health effects.

As the map below illustrates, TVA currently stores millions of tons of ash in unlined ponds, or "impoundments," that lie on or adjacent to our rivers and streams, close to public drinking water intakes. Because the ash in these ponds contaminates groundwater and surface water, they pose a present and ongoing risk to human health and the environment.



In January 2016, TVA published its Draft Ash Impoundment Closure Environmental Impact Statement (DEIS), in which it purports to satisfy the requirements of the National Environmental Policy Act (NEPA). TVA states that the purpose of the DEIS is to analyze options for closing the ash ponds throughout TVA's system. Program-wide, it concludes that it prefers to cover its coal ash in place, in leaking, unlined pits, rather than excavating and moving it to dry, lined storage that would prevent toxic substances in the ash from polluting groundwater and surface water. TVA then analyzes ponds at six specific sites—Kingston, Bull Run, John Sevier and Allen in Tennessee, and Colbert and Widows Creek in Alabama—and states its intent to cover its coal ash at each of these sites, without excavating and moving it to safer storage.

As discussed in detail in the comments that follow, TVA has set an artificial and unnecessarily short timeline for closing its ponds. In doing so, it fails to consider basic information that is necessary to assess the ongoing risk of contamination and harm at each site. It does not disclose whether the ash sits in groundwater, which poses a significant risk of contamination to people whose drinking water comes from nearby groundwater wells. Nor does TVA consider whether the coal ash pit is located in an unstable area, which creates a significant ongoing risk that the storage area may collapse.

If the groundwater is connected to surface water, coal ash pollution will also spread to nearby rivers and streams. TVA fails to acknowledge that such contamination poses risks to people who may ingest heavy metals through their water supply or from fish caught in rivers and reservoirs.

Without considering these critical risk factors, TVA cannot satisfy its obligation under NEPA to analyze fully and fairly the environmental impacts associated with its proposal, let alone determine whether its proposal will comply with other federal and state environmental laws that govern coal ash disposal and water pollution.

In the attached comments, we discuss TVA's legal obligations in detail and explain the deficiencies in TVA's analysis presented in the DEIS. These comments reflect evaluation of the flawed and incomplete analysis contained in the DEIS by attorneys at the Southern Environmental Law Center, Environmental Integrity Project, and Southern Alliance for Clean Energy, with additional expert evaluations performed by Global Environmental LLC (Mark Quarles, Licensed Professional Geologist); RT Environmental Services, Inc. (Gary Brown, Professional Engineer); and Freight Insights LLC (Susan Atherton, M.E., Operations Research).

Sincerely,

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COMMENTS ON TVA'S DRAFT ENVIRONMENTAL IMPACT STATEMENT FOR ASH IMPOUNDMENT CLOSURE PLAN

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DEIS PART I: PROGRAMMATIC ANALYSIS

I. Summary of Comments

NEPA requires TVA to analyze fully, fairly, and publicly the environmental impacts associated with a reasonable range of alternatives before choosing a course of action. In addition to NEPA, TVA's proposal to close its coal ash ponds must comply with other state and federal laws governing coal ash disposal and water pollution. As currently drafted, the Draft Ash Impoundment Closure Environmental Impact Statement (DEIS)[1] does not satisfy the requirements for full and fair public disclosure and analysis of impacts under NEPA, nor does its closure plan comply with other state and federal law.

The DEIS is fundamentally deficient in several ways.

- First, the public's ability to comment meaningfully on the DEIS has been thwarted by TVA's refusal to disclose key analyses of environmental impacts.

- Second, TVA's programmatic approach to closure of coal ash ponds improperly obscures the extent of site-specific environmental impacts.

- Third, the statement of purpose and need in the DEIS artificially constrains TVA's timeline for closing the ponds and ignores the full extent of TVA's legal obligation to protect human health and the environment.

- Fourth, the "no action" alternative analyzed in the DEIS is manifestly contrary to TVA's existing legal obligations. Its analysis of impacts must therefore reflect the consequences of enforcement that must be undertaken by EPA, the State or citizens.

- Fifth, neither the programmatic DEIS nor the site-specific analyses consider a reasonable range of clean closure alternatives, including closure that uses on-site lined landfills or transportation off-site by rail, barge, or other trucking options.

- Finally, the DEIS fails to establish the proper baseline for analysis of key impacts, particularly impacts to groundwater and surface water. Contrary to

[1] *See, generally,* TVA, Draft Ash Impoundment Closure Environmental Impact Statement (December 2015) [hereinafter DEIS].

> standard practice for siting waste disposal sites, TVA does not even consider whether the ash sits in groundwater or is located in an unstable area.

In addition to these fundamental flaws, the DEIS fails to disclose and analyze a host of significant environmental impacts to groundwater, surface water, aquatic ecology, wildlife, and threatened and endangered species that are associated with capping the unlined ash pits in place. Moreover, TVA overstates, without supporting analysis or documentation, the cost of clean closure and its transportation and other impacts.

Not one of these deficiencies of the programmatic analysis in Part I of the DEIS is remedied in the site-specific analyses in Part II. The site-specific analyses fail to consider the following essential factors, among others:

- Location of the uppermost aquifer and whether the ash is in ongoing contact with groundwater;
- Potential for waste washout during flood events; and
- Unstable geologic features, such as the presence of karst.

In sum, the DEIS is flawed from start to finish. TVA must start over and provide the full and fair analysis required by NEPA.

II. NEPA requires TVA to analyze fully, fairly and publicly the environmental impacts associated with a reasonable range of alternatives before choosing a course of action.

NEPA is "our basic national charter for protection of the environment."[2] Other environmental statutes focus on particular media (like air, water or land), specific natural resources (such as wilderness areas, or endangered plants and animals), or discrete activities (such as mining, introducing new chemicals, or generating, handling or disposing of hazardous substances). In contrast, NEPA applies broadly "to promote efforts which will prevent or eliminate damage to the environment."[3]

> [NEPA] has 'twin aims. First, it places upon [a federal] agency the obligation to consider every significant aspect of the environmental impact of a proposed action. Second, it ensures that the agency will inform the public that it has indeed considered environmental concerns in its decisionmaking process.[4]

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[2] 40 C.F.R. § 1500.1(a).

[3] National Environmental Policy Act § 2, 42 U.S.C. § 4321.

[4] *Kern v. Bureau of Land Mgmt.*, 284 F.3d 1062, 1066 (9th Cir. 2002) (quoting *Balt. Gas & Elec. Co. v. Natural Res. Def. Council, Inc.*, 462 U.S. 87, 97 (1983)) (internal quotations and citations omitted, alteration in original).

To accomplish its goal of informed decision-making, NEPA requires the agency proposing the action to provide a full and fair analysis of the environmental impacts of a proposed action and its alternatives.[5] In order to engage in this analysis, the agency must (1) define the purpose of its action; (2) identify reasonable alternatives that might help it achieve that purpose; and (3) describe an accurate environmental baseline against which to evaluate the impacts of the proposed action and its alternatives.[6] An agency must base its decision on information that is available to the public.[7]

NEPA "emphasizes the importance of coherent and comprehensive up-front environmental analysis to ensure informed decisionmaking to the end that 'the agency will not act on incomplete information, only to regret its decision after it is too late to correct.'"[8] Only after fully evaluating a reasonable range of alternatives and the environmental impacts associated with each in compliance with NEPA may an agency determine its preferred course of action.

III. In addition to satisfying NEPA, TVA's proposal to close its coal ash ponds must comply with other state and federal laws governing coal ash disposal and water pollution.

In 2008, TVA's mismanagement of its coal ash impoundment at Kingston caused the largest coal ash spill in this country's history—over one billion gallons of coal ash released into the Emory and Clinch Rivers.[9] TVA has spent more than $1 billion on clean-up.[10] After the Kingston spill, the TVA Board required TVA to move its ash to dry storage.[11] And in response to the Kingston spill, EPA developed the Coal Ash Rule,[12] which establishes nationwide minimum standards for coal ash disposal to protect the public and the environment from adverse effects of contamination of groundwater and surface water.[13]

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[5] 40 C.F.R. § 1502.14.

[6] 40 C.F.R. §§ 1502.13–.16.

[7] *WildEarth Guardians v. Mont. Snowmobile Ass'n*, 790 F.3d 920, 927 (9th Cir. 2015).

[8] *Blue Mountains Biodiversity Project v. Blackwood*, 161 F.3d 1208, 1216 (9th Cir. 1998).

[9] Att. 1, Duane Gang, *Five years after coal ash spill, little has changed*, USA Today (Dec. 23, 2013), http://www.usatoday.com/story/news/nation/2013/12/22/coal-ash-spill/4143995/.

[10] *Id.*

[11] DEIS Part I at 2.

[12] Att. 2, U.S. EPA, Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residuals from Electric Utilities; Final Rule, 80 Fed. Reg. 21,302, 21,312 (Apr. 17, 2015); as amended by Technical Amendments to the Hazardous and Solid Waste Management System; Att. 3, Disposal of Coal Combustion Residuals from Electric Utilities—Correction of the Effective Date, 80 Fed. Reg. 37,988 (July 2, 2015) [hereinafter Coal Ash Rule].

[13] 40 C.F.R. § 257.1 (purpose of Coal Ash Rule is "for determining which CCR landfills and CCR surface impoundments pose a reasonable probability of adverse effects on health or the environment…."); *id.* § 257.50 (Coal Ash Rule establishes "minimum national criteria"); Att. 2, Coal Ash Rule, 80 Fed. Reg. at 21,313–30 (discussing EPA's risk assessment justifying regulation, including finding cancer risk from arsenic contamination above levels of concern and damage cases indicating contamination of groundwater in unlined impoundments and landfills); *id.* at 21,326 (variation in state programs "strongly supports the need for federal requirements to establish a consistent national standard of groundwater and human health protection").

The adverse effects of coal ash contamination are well-documented. In the risk assessment justifying the Coal Ash Rule, EPA determined cancer risks from arsenic contamination were significantly above levels of concern.[14] EPA also found non-cancer risks to be above levels of concern.[15] Moreover, it found that health and environmental damage cases "were primarily associated with unlined units."[16] EPA concluded that these risks warranted regulation of coal ash under the federal Resource Conservation and Recovery Act.[17]

As the Coal Ash Rule recognizes, location matters. The Coal Ash Rule requires new and existing impoundments, as well as new landfills, to comply with five location restrictions: ash generally must not be stored in (1) the uppermost aquifer; (2) wetlands; (3) fault areas; (4) seismic impact zones; or (5) unstable areas.[18] A unit in any of these settings must close if it does not meet specified requirements.[19] The restriction prohibiting location in unstable areas applies to existing landfills as well as the other categories of covered units.[20]

The Coal Ash Rule also requires new landfills and impoundments to install liners between the ash and the underlying surface.[21] Among other requirements, existing landfills and impoundments are subject to ongoing groundwater monitoring requirements and corrective action if monitoring demonstrates exceedances of certain coal ash pollutants.[22]

In its risk assessment supporting the Coal Ash Rule, EPA found that "disposal of CCR wastes in unlined surface impoundments and landfills presents the greatest risks to human health and the environment."[23] EPA also found that disposal of coal ash in unlined pits was responsible for the vast majority of damage cases based on groundwater and surface water contamination.[24]

Experience with unlined, capped landfills in TVA territory confirms that location and the lack of a liner matter. Several coal ash dumps have continued to contaminate groundwater after capping coal ash in place, including those at TVA's Gallatin Fossil Plant and Colbert Fossil

[14] Att. 2, Coal Ash Rule, 80 Fed. Reg. at 21,326.
[15] *Id.*
[16] *Id.*
[17] *Id.*
[18] 40 C.F.R. §§ 257.60–.64.
[19] *Id.* § 257.101.
[20] *Id.* § 257.64.
[21] *Id.* §§ 257.70–.72.
[22] *Id.* §§ 257.91–.98.
[23] Att. 4, U.S. EPA, RIN 2050-AE81, Human and Ecological Risk Assessment of Coal Combustion Residuals, at ES-7 (Dec. 2014).
[24] Att. 2, 80 Fed. Reg. 21,452, 21,361.

Plant.[25] At Colbert, for example, in the 1980s, sinkholes developed at Ash Pond 5. TVA eventually capped the sinkhole area and converted Ash Pond 5 to dry storage. Nevertheless, the unlined Ash Pond 5 area continued to contaminate groundwater, resulting in an enforcement action by the Alabama Department of Environmental Management (ADEM) and a consent decree pursuant to which TVA has sought a permit for dry, lined storage at the site. At Gallatin, significant contamination is coming from a disposal site that was closed and dewatered years ago, and capped with soil, but continues to leach heavy metals into the groundwater because no liner was installed. Both the Gallatin and Colbert ash dumps are sited on karst terrain directly adjacent to rivers.

Experience with unlined, capped landfills has been similar in other states in our region. In Belews Creek, North Carolina, the Pine Hall Road coal ash landfill is unlined and was closed with a synthetic cap in 2008. This site was listed by EPA as a potential damage case in 2010 because groundwater contamination continued, exceeding limits for arsenic, boron, iron, manganese, nitrate, selenium, sulfate.[26] Similarly, at Dominion's Chesapeake, Virginia, coal ash site, an unlined coal ash landfill was capped by installing a synthetically lined landfill on top of it. The landfill has repeatedly reported exceedances of arsenic and other heavy metals.[27] Such examples illustrate the importance of taking site-specific characteristics into account when determining whether capping in place is an appropriate way to close a coal ash pond.

In addition to the Coal Ash Rule, TVA's coal ash disposal is regulated by the federal Clean Water Act, which seeks to "restore and maintain the chemical, physical, and biological integrity of the Nation's waters."[28] To accomplish this goal, the Clean Water Act prohibits discharge of any pollutant except in compliance with a National Pollutant Discharge Elimination System (NPDES) permit.[29] The Clean Water Act is a strict liability statute. Each violation of a NPDES permit, and each discharge that is not authorized by the NPDES permit, is a violation of the Clean Water Act. NPDES permits issued for coal ash disposal typically prohibit discharges to groundwater.[30]

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[25] *See* Att. 5, Mark Quarles, Summary of Opinions Regarding TVA's Draft Ash Impoundment Closure Environmental Impact Statement, ¶ 30, Ex. 7 (Feb. 9, 2016) [hereinafter Quarles Report]; Att. 6, TVA, Colbert Fossil Plant, Groundwater Incident 93-6-4, Groundwater Monitoring Report, April 2015 §§ 2.3, 2.4 (July 27, 2015).

[26] Att. 7, Comments on Alleged and Established Damage Cases in EPA's Region 4, Based on Testimonies at the Proposed CCR Management Rule Public Hearings, Association of State And Territorial Solid Waste Management Officials, http://www.astswmo.org/Files/Policies_and_Publications/Cross-program/Coal_Combustion_Residuals/2011.11-NODA_Comments/North_Carolina_NODA_Comments.pdf.

[27] Att. 8, *Protecting Chesapeake as Dominion Shuts Plant*, The Virginian-Pilot (Aug. 21, 2014), http://pilotonline.com/opinion/editorial/protecting-chesapeake-as-dominion-shuts-plant/article_80821370-4bee-5ca5-9d8e-57d30da0e068.html.

[28] 33 U.S.C. § 1251(a).

[29] *Id.* §§ 1311, 1342.

[30] *See, e.g.*, Att. 9, ADEM, Widows Creek Fossil Plant, NPDES Permit No. AL0003875 at pt. III.G (Mar. 8, 2005); *see also Friends of Santa Fe Cty. v. LAC Minerals, Inc.*, 892 F. Supp. 1333, 1358 (D.N.M. 1995) (noting that the

EPA recently promulgated regulations establishing effluent limitation guidelines (ELGs) for coal ash.[31] The ELGs require zero discharge of pollutants from bottom ash and fly ash transport water at all plants greater than 50 MW.[32] To achieve this technology standard, facilities generally will have to use dry ash handling.

In addition, although the ELGs did not determine a technology-based standard for "legacy wastewater,"[33] the Clean Water Act and implementing regulations require state permitting agencies to exercise best professional judgment to establish case-by-case, technology-based effluent limitations for pollutants when issuing NPDES permits.[34] For toxic pollutants, the permitting agency must establish technology-based limits based on the best available technology economically achievable.[35]

TVA's coal ash disposal is also regulated by state water pollution and solid waste laws. While these requirements vary, the State of Tennessee has taken the position that TVA's coal ash disposal in an impoundment at the Gallatin Fossil Plant violates State water pollution laws.[36] The State of Tennessee has also asserted that its solid waste laws may require more stringent regulation of coal ash disposal than the Coal Ash Rule.[37] Indeed, in its Commissioner's Order dated August 6, 2015, the Tennessee Department of Environment and Conservation specifically asserted jurisdiction and supervision over TVA's selection of closure methods for coal ash ponds.[38]

Neighboring states and utilities have also recognized clean closure—removal of coal ash to a dry, appropriately lined landfill—as the appropriate remedy for groundwater contamination at existing impoundments.[39] In South Carolina, for example, all of the utilities have committed to close their ash ponds by excavating the ash and removing it to dry, lined storage.

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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).

[31] Att. 10, U.S. EPA, Final Rule: Effluent Limitations Guidelines and Standards for the Steam Electric Power Generating Point Source Category, 80 Fed. Reg. 67,838, 67,854–55 (Nov. 5, 2015) [hereinafter ELG Rule].

[32] 40 C.F.R. § 423.13.

[33] Att. 10, ELG Rule, 80 Fed. Reg. at 67,854-55.

[34] *See* 33 U.S.C §§ 1311(b)(2)(A), 1342(a)(1); 40 C.F.R. §§ 125.3(a), 125.3(c)(2).

[35] *See* 33 U.S.C. § 1311(b)(2)(A); 40 C.F.R. § 125.3(a)(2)(iii).

[36] Att. 11, Complaint, *State v. TVA*, No.15-23-II (Tenn. Ch. Ct. 20th Div. 2015), http://attorneygeneral.tn.gov/cases/tva/tvacomplaint.pdf.

[37] Att. 12, Commissioner's Order at 2, *In re Tenn. Valley Auth.*, No. OGC015-0177 (Tenn. Dep't of Env't & Conservation Aug. 8, 2015), https://tn.gov/assets/entities/environment/attachments/TVA_Order_8-6-15.pdf.

[38] *Id.* at 7.

[39] Att. 13, Consent Agreement, *In re Duke Energy Progress, Inc., Robinson Steam Elec. Plant*, No. 15-23-HW (S.C. Dep't of Health & Envtl. Control 2015); Att. 14, Sen. Larry Martin & Rep. Davey Hiott, *Rules Change for Coal Ash was Needed*, Greenville Online (Feb. 29, 2016), www.greenvilleonline.com/story/opinion/contributors/2016/02/29/rules-change-coal-ash-needed/80937280/.

At a January meeting of TVA's Regional Energy Resource Council (RERC), a representative of TVA suggested that, in contrast to utilities in North and South Carolina, no federal or state law requires TVA to remove its ash to dry, lined storage if that is the disposal option that adequately protects public health and the environment.[40] As discussed above, this is incorrect.

IV. The DEIS does not satisfy the requirements for full and fair public disclosure and analysis of impacts under NEPA, including disclosure and analysis of TVA's obligation to comply with other state and federal law.

The DEIS comprises two parts. In Part I, TVA presents a "programmatic" or system-wide analysis of the environmental impacts associated with two alternatives: Alternative B, which describes TVA's preferred alternative—to close its coal ash ponds in place; and Alternative C, which describes in general terms excavating the coal ash and removing it to a dry, lined landfill ("clean closure"). In Part II, TVA applies the analysis and conclusions it reaches in Part I to ponds at six coal plants: Allen, Bull Run, Kingston and John Sevier in Tennessee, and Widows Creek and Colbert in Alabama.

TVA's obligation to comply with the existing state and federal environmental laws described in Section III is a critically significant aspect of the analysis required by NEPA. This legal and regulatory framework should provide the foundation upon which TVA defines the purpose and need for the project and identifies the range of alternatives it will consider. Yet apart from the minimum standards set forth in the federal Coal Ash Rule, the DEIS barely mentions these bedrock laws and regulations.[41] And, as discussed in more detail below, TVA misinterprets both the letter and intent of the Coal Ash Rule in key ways that mischaracterize the range of alternatives available to it and the impacts associated with each one.

It was primarily concern about groundwater contamination that led EPA to determine that federal regulation of coal ash disposal is warranted. Yet the DEIS devotes only seven pages to groundwater analysis at the programmatic level. This limited analysis relies exclusively on misinterpretation of the Coal Ash Rule and an undisclosed study of a "hypothetical" coal ash pond by the Electric Power Research Institute (EPRI), an industry "research" arm. Neither source provides the site-specific analysis required by NEPA.

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[40] Att. 15, TVA, Reg'l Energy Resource Council Meeting, Transcript, Day 2, p. 26 (Jan. 20–21, 2016) [hereinafter RERC Transcript] ("So we think one of the great questions we're getting now is why is TVA different from Duke. And so you have to balance in what the legislature is making the utilities do.").

[41] *See* Att. 5, Quarles Report ¶¶ 1–6, 43–45, 54–56 (Feb. 9, 2016); Att. 16, RT Environmental Services, Letter to B. Alexander re: Programmatic Environmental Impact Statements and Site by Site Documents Prepared by TVA-Combustion Coal Ash Management RT Project # 72571-01, at 1–5 (Mar. 3, 2016) [hereinafter RT Report]. The Quarles Report and RT Report, and the comments and analysis contained therein, are hereby incorporated by reference.

TVA admits that it has not determined the location of the uppermost aquifer at each site, and purportedly has no idea whether the ash is sitting continuously in groundwater. TVA cannot adequately evaluate closure options until it determines whether ash is within the water table. This is a fundamental question in any disposal decision, and should be central to TVA's analysis of baseline environmental conditions and the environmental impacts of each alternative.

The DEIS also fails to provide an adequate analysis of surface water and floodplain impacts, as well as related impacts to wildlife, aquatic ecology and threatened and endangered species. TVA omits important analysis and mitigation measures in its discussion of transportation, air quality, greenhouse gases and environmental justice impacts.

A. The public's ability to comment meaningfully on the DEIS has been thwarted by TVA's refusal to disclose key analyses of environmental impacts.

NEPA requires "that the relevant information will be made available to the larger audience that may also play a role in both the decisionmaking process and the implementation of that decision."[42] To comply with NEPA, an agency

> must insure that environmental information is available to public officials and citizens before decisions are made and before actions are taken. The information must be of high quality. Accurate scientific analysis, expert agency comments, and public scrutiny are essential to implementing NEPA.[43]

Where this information is not provided by the agency, the public is "limited to two-dimensional advocacy" in violation of NEPA.[44] By depriving the public of relevant information, the agency asks the public and other decision-makers "to assume the adequacy and accuracy of partial data without providing any basis for doing so."[45]

In its analyses of key environmental impacts, including impacts on groundwater, surface water, air quality and greenhouse gases, the DEIS relies heavily on two reports by EPRI: the Impact Framework and the Impact Assessment.[46] At least one of these reports was commissioned by TVA to assist it in its analysis of closure options for coal ash ponds.[47] Although a representative of EPRI presented the results of EPRI's analyses at a meeting of TVA's Regional Energy Resource Council in January 2016, neither the reports themselves nor

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[42] *Robertson v. Methow Valley Citizens Council*, 490 U.S. 332, 349 (1989).

[43] 40 C.F.R. § 1500.1(b).

[44] *WildEarth Guardians*, 790 F.3d at 927.

[45] *Id.*

[46] DEIS Part I at 39–40 (air quality), 43–44 (greenhouse gases), 57–59 (groundwater quality), 68–69 (surface water); EPRI, Relative Impact Framework for Evaluating Coal Combustion Residual (CCR) Surface Impoundment Closure Options (Jan. 2015);EPRI, Relative Impact Assessment Report for a Hypothetical Coal-Powered Utility on a River in Tennessee (Oct. 2015).

[47] Att. 17, E-mail between Anne Davis, SELC, and Valerie Vaughn, EPRI (Feb. 5, 2016).

the underlying data and assumptions upon which EPRI based its analyses were provided to the public.[48]

Environmental groups subsequently requested the reports and underlying data from TVA and were told they would need to purchase the reports from EPRI.[49] The Impact Framework alone costs $25,000.[50] The Impact Assessment is not yet available for sale.[51]

The Southern Environmental Law Center (SELC) then submitted a federal Freedom of Information Act (FOIA) request to TVA to obtain the Impact Framework, Impact Assessment, and underlying data and documents.[52] TVA rejected SELC's request, citing Exemption 4 of the FOIA, which protects confidential business information.[53] SELC plans to appeal TVA's determination to the FOIA Appeal Official, questioning the basis upon which Exemption 4 applies to the reports and underlying data.

Regardless of whether all or portions of the Impact Framework and Impact Assessment and underlying data are ultimately found to be exempt from FOIA, NEPA requires that TVA make public the data and analysis that support its proposed action.[54] As detailed extensively below, TVA has not satisfied that requirement. Nor can it, if it continues to rely on the undisclosed EPRI reports instead of performing, in the public's view, the site-specific analysis required by NEPA.[55]

Although TVA baldly states in the DEIS that the Impact Assessment "provide[s] additional support to the understanding of potential environmental impacts from alternatives

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[48] Att. 18, EPRI, Relative Impact Framework Closure in Place vs. Excavate and Redispose, Presentation at TVA Regional Energy Resource Council Meeting (Jan. 20, 2016), https://www.tva.gov/file_source/TVA/Site%20Content/About%20TVA/Our%20Public%20Advisory%20Councils/Regional%20Energy%20Resource%20Council/pdf/Presentation_Jan21-22-2016.pdf [hereinafter EPRI Presentation].

[49] Att. 19, Letter from Amy Henry, TVA to Angela Garrone, S. Alliance for Clean Energy (Feb. 5, 2016).

[50] Att. 20, EPRI, *Product Abstract, Relative Impact Framework for Evaluating Coal Combustion Residual Surface Impoundment Closure Options* (Oct. 2015), http://www.epri.com/abstracts/Pages/ProductAbstract.aspx?ProductId=000000003002006286; Att. 17, e-mail between Anne Davis, SELC, and Valerie Vaughn, EPRI (Feb. 5, 2016).

[51] Att. 19, Letter from Amy Henry, TVA, to Angela Garrone, S. Alliance for Clean Energy (Feb. 5, 2016); Att. 21, Letter from Denise Smith, TVA, to Beth Alexander, SELC, Re: Expedited Freedom of Information Act Request: Tennessee Valley Draft Ash Impoundment Environmental Impact Statement December 2015 (Feb. 19, 2016) [hereinafter TVA Response to SELC FOIA Request re: EPRI Studies].

[52] Att. 22, Letter from Beth Alexander, SELC, to Denise Smith, TVA, re: Expedited Freedom of Information Act Request: Tennessee Valley Draft Ash Impoundment Environmental Impact Statement December 2015 (Feb. 9, 2016) [hereinafter SELC FOIA Request re: EPRI Studies].

[53] TVA Response to SELC FOIA Request re: EPRI Studies.

[54] *WildEarth Guardians*, 790 F.3d at 927.

[55] *See California v. Block*, 690 F.2d 753, 761 (9th Cir. 1982).

under consideration,"[56] in fact the Impact Assessment provides the sole source of analysis for key impacts, including groundwater impacts.[57] Moreover, the Impact Framework and Impact Assessment appear to have provided the sole basis for the range of alternatives considered in the DEIS. As TVA's NEPA compliance officer stated at the January meeting of the RERC, "[Y]ou heard Bruce walk through the model that EPRI has put together. And we've used that here in the EIS as an analytical tool to help us understand really the relative impacts between the two alternatives. So you will see that described in part one and throughout the EIS itself."[58]

Because it contracted with EPRI, TVA appears to have voluntarily outsourced its environmental analysis to EPRI in an effort to evade public scrutiny of its controversial plan to cover up its coal ash rather than move it to safe storage.[59] While the Impact Framework may be technically "available," it is not *accessible* to the public because of the extraordinary cost to purchase the report.[60] The Impact Assessment is completely unavailable to the public. TVA's intentional use of a private contractor to hide its inadequate environmental analyses from the public, under the cloak of "proprietary information," undermines the fundamental purposes of NEPA.[61]

B. The analysis in the DEIS demonstrates that TVA's programmatic approach to closure of coal ash ponds improperly obscures the extent of site-specific environmental impacts.

Under NEPA, a programmatic EIS may be appropriate when an agency is considering a "broad" action that shares common features, such as similar timing or geography.[62] A programmatic EIS is not intended to allow the agency to obscure the extent of site-specific environmental impacts or to narrow artificially the alternatives available during site-specific analysis.[63] Yet, as revealed in TVA's site-specific analyses in Part II of the DEIS and described in detail throughout these comments, that is precisely what TVA has done.

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[56] DEIS Part I at 27. TVA reiterated this view in Att. 23, a letter from Greg Signer, Associate General Counsel, to Anne Davis, SELC (Feb. 26, 2016).

[57] *See* Section IV.F.2 (Groundwater) below; *see also* Sections IV.F.3 ("Surface Water") and IV.F.7 (Transportation).

[58] Att. 15, RERC Transcript at Day 1, pp. 190–91.

[59] Att. 17, e-mail between Anne Davis, SELC, and Valerie Vaughn, EPRI (Feb. 5, 2016).

[60] *See Coal. for Canyon Preserv. v. Bowers*, 632 F.2d 774, 782 (9th Cir. 1980).

[61] *See Methow Valley Citizens Council*, 490 U.S. at 349 (one purpose of NEPA is public disclosure and analysis of environmental impacts).

[62] 40 C.F.R. § 1502.4(b)–(c); Att. 24, Council on Environmental Quality, Forty Most Asked Questions Concerning CEQ's National Environmental Policy Act Regulations, 46 Fed. Reg. 18,026, 18,033 (Mar. 23, 1981) ("The preparation of an area-wide or overview EIS may be particularly useful when similar actions, viewed with other reasonably foreseeable or proposed agency actions, share common timing or geography.").

[63] *Block*, 690 F.2d at 761 ("The critical inquiry in considering the adequacy of an EIS prepared for a large scale, multi-step project is not whether the project's site-specific impact should be evaluated in detail, but when such detailed evaluation should occur."); *id.* at 763 ("The promise of site-specific EIS's [sic] in the future is meaningless if later analysis cannot consider wilderness preservation as an alternative to development.").

A coalition of environmental groups explained in scoping comments that a programmatic EIS "is not an appropriate vehicle for consideration of the environmental impacts associated with closure in place or closure by removal…."[64] The coalition detailed the features that vary at each of TVA's coal plants, including the presence of karst or other unstable areas, relationship to the floodplain, seismic issues, proximity to water, unique construction features, and long, varied histories.[65] In addition, off-site storage and transportation options vary from site to site, resulting in differences in the short-term impacts from removing ash from each site to lined landfills.

TVA's discussion in the DEIS confirms that sites throughout TVA territory vary greatly in underlying geology, accessibility of rail and barge transport, and other factors key to its impact analysis.[66] Its programmatic analysis nonetheless treats these varying features and their impacts as similar enough to draw conclusions that apply to all of the site-specific analyses in Part II. In fact, we understand that, although the EPRI Impact Assessment commissioned by TVA could have taken at least some of these site-specific variables into account, it did not.[67] Since EPRI's assumptions do not consider site-specific characteristics, they are not based on the *actual* risks presented by leaving ash in unlined pits in unstable areas connected to groundwater.[68] Instead, the EPRI Impact Assessment relies on a "hypothetical" coal ash pond with undisclosed characteristics that cannot possibly reflect the specific environment at each site.[69]

A key example of this flawed analysis is TVA's rejection of clean closure at the *programmatic* level for larger impoundments at Bull Run, Kingston, Colbert and Widows Creek, notwithstanding the potential for site-specific variability.[70] TVA admits that it has not identified the location of the uppermost aquifer at its ash impoundments, and that "the extent to which [] leaching may occur and how it may interact with the uppermost aquifer and receiving surface waters is dependent upon site-specific conditions…."[71] Nevertheless, TVA relies on the generic, "hypothetical" analysis in the EPRI Impact Assessment, and its own limited experience at an

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[64] Att. 25, S. Alliance for Clean Energy, et al., Scoping Comments on TVA Environmental Impact Statement for the Closure of CCR Impoundments (Sept. 30, 2015) [hereinafter Scoping Comments].

[65] *Id.*

[66] *See, e.g.*, DEIS Part I at 47–48 (describing diverse geologic zones across Valley), 50–51 (describing diverse seismic features across Valley), 55–56 (describing diverse aquifer features across Valley), 103–104 (describing transportation options generally).

[67] At the January 2016 RERC meeting, a representative of EPRI stated that the Impact Framework was intended to be applied at the site-specific level: "So instead of just arm waving, oh, this is what I think is going to happen, you're going to do modeling and you're going to base it on real world input, site specific inputs." Att. 15, RERC Transcript at Day 1, p. 134.

[68] In any event, as explained in Section IV.A, TVA improperly relies on non-public information in the EPRI Impact Assessment to support its conclusions.

[69] Att. 18, EPRI Presentation (presenting findings without disclosing assumptions); DEIS Part I at 27–28 (describing model "scenarios" at hypothetical coal ash pond).

[70] DEIS Part I at 26 (rejecting clean closure for inactive sites with coal ash volumes exceeding 500,000 cubic yards).

[71] *Id.* at 57.

unrelated, small sluicing channel at the Cumberland Fossil Plant, to conclude that groundwater impacts at sites with large volumes of coal ash do not warrant clean closure.[72] Indeed, TVA's NEPA compliance officer admitted at the January meeting of the RERC that, in TVA's analysis at the programmatic level and at each site, "we use the general model on it. We don't have modeling for each site specifically."[73] In other words, while failing to disclose information about where the uppermost aquifers are at its own ash pits, TVA uses EPRI's undisclosed, "hypothetical" impacts analysis to blindfold itself to the site-specific conditions that would contradict the propriety of its programmatic approach.

TVA also admits that it has not accurately characterized each site's hydrogeologic conditions.[74] Accordingly, it has not accurately noted baseline conditions against which to evaluate actual impacts to groundwater and surface water at each site. The cap-in-place "scenario" modeled in EPRI's Impact Assessment, which keeps ash in continuous contact with groundwater, likely understates risk by not taking into account these site-specific conditions.[75]

In addition, nowhere in the DEIS does TVA discuss the potential for sinkhole formation at sites with significant karst features, such as at Gallatin, Colbert, Kingston and Widows Creek.[76] TVA has experienced sinkhole formation at its unlined landfill at Kingston, which contaminated groundwater and triggered an Order for remedial action by the State of Tennessee.[77] Similarly, Ash Pond 5 at Colbert Fossil Plant developed sinkholes and has continuously contaminated groundwater since the 1980s, despite the ash having been moved to drier, unlined storage.

EPA observed in the Preamble to the Coal Ash Rule that such site-specific concerns are of *greater* magnitude at larger sites: "Larger units are also the ones more likely to present the highest risks, and so warrant the greater oversight provided by application of all of the technical criteria to their operation (and closure)."[78] EPA also acknowledged that large sites would likely be unable to close by April 2018, and expressly stated that it would be better for the environment if large sites were subject to post-closure care.[79] Yet without taking any of these site-specific

[72] *Id.* at 57-59.

[73] Att. 15, RERC Transcript at Day 1, p. 202.

[74] DEIS Part I at 57; Att. 5, Quarles Report ¶¶ 35-42.

[75] Att. 18, EPRI Presentation at 68. We note that because we have not been provided access to the EPRI Impact Assessment, we cannot comment specifically on the assumptions it used.

[76] *Id.* We note that, because we have not been provided access to the EPRI Impact Assessment, we cannot comment specifically on the assumptions it used.

[77] Att. 26, Commissioner's Order at 4–5, 8–12, *In re Tenn. Valley Auth.*, Nos. SWM 10-0010, WPC 10-0135 (Tenn. Dep't of Env't & Conservation Dec. 17, 2010).

[78] Att. 2, Coal Ash Rule, 80 Fed. Reg. at 21,409.

[79] *Id.* (explaining that larger units may not be able to close within three-year timeframe established for inactive units to avoid ongoing post-closure requirements).

concerns into account—precisely so that it can close these sites by April 2018—TVA willfully refuses to consider clean closure. [80]

All of TVA's subsequent site-specific analyses of larger inactive impoundments in Part II proceed from its inadequate programmatic analysis, without further site-specific analysis of groundwater impacts.[81] Thus, TVA does not consider clean closure as an alternative at Kingston, Bull Run, Colbert or Widows Creek.[82] TVA's reliance on an inadequate programmatic analysis cannot absolve it of its failure to disclose and analyze impacts at the site-specific level .[83] Moreover, even when TVA does consider clean closure at the site-specific level, it reverts to the faulty assumptions and limited range of alternatives considered in the programmatic EIS to evaluate impacts, as discussed in more detail below. This, too, violates NEPA.[84]

TVA's flawed programmatic analysis is not limited to groundwater impacts. As discussed in more detail below, TVA's analysis of other key impacts, including transportation and air quality, similarly ignore site-specific data and analysis, rendering the programmatic DEIS, and all analyses that tier to it, inadequate.

C. TVA's statement of purpose and need artificially imposes a short timeline for pond closure and ignores the full scope of its legal obligation to protect human health and the environment.

NEPA requires TVA to define "the underlying purpose and need to which the agency is responding in proposing the alternatives including the proposed action."[85] "The stated goal of a project necessarily dictates the range of 'reasonable' alternatives and an agency cannot define its objectives in unreasonably narrow terms."[86]

According to TVA, "The purpose of this PEIS [sic] is to address the potential impacts of closing CCR impoundments across the TVA system and to assist TVA in complying with EPA's

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[80] DEIS Part I at 26.

[81] "Environmental sensitivity" triggers for further site-specific analysis (DEIS Part I at 4) do not include key risk factors such as groundwater contamination or availability of alternative transportation.

[82] TVA, Draft Ash Impoundment Closure Programmatic EIS, Part II—Site-Specific NEPA Review: Bull Run Fossil Plant 6 (Dec. 2015) [hereinafter DEIS Part II (Bull Run)]; TVA, Draft Ash Impoundment Closure Programmatic EIS, Part II—Site-Specific NEPA Review: Kingston Fossil Plant 6 (Dec. 2015) [hereinafter DEIS Part II (Kingston)]; TVA, Draft Ash Impoundment Closure Programmatic EIS, Part II—Site-Specific NEPA Review: Widows Creek Fossil Plant 6 (Dec. 2015) (considering only closure-in-place) [hereinafter DEIS Part II (Widows Creek)]; TVA, Draft Ash Impoundment Closure Programmatic EIS, Part II—Site-Specific NEPA Review: Colbert Fossil Plant 6 (Dec. 2015) [hereinafter DEIS Part II (Colbert)].

[83] *Block*, 690 F.2d at 761.

[84] *Id.*

[85] 40 C.F.R. § 1502.13.

[86] *City of Carmel-By-The-Sea v. U.S. Dep't of Transp.*, 123 F.3d 1142, 1155 (9th Cir. 1997).

CCR Rule."[87] As described in detail in Section III above, the Coal Ash Rule establishes minimum standards for closure, but is not the only source of TVA's legal obligations to manage its coal ash.[88] In order to identify the range of alternatives that are reasonable, TVA must take stock of *all* applicable laws—including state laws and the federal Clean Water Act—not just the bare minimum standards.

Even if the Coal Ash Rule were the only law applicable to coal ash ponds, TVA has misinterpreted the applicable regulations, leading it to define the purpose of its closure plan too narrowly. First, it interprets the Coal Ash Rule "to encourage regulated entities to accelerate the closure of CCR impoundments because of the decrease in groundwater risk and increased structural stability that results from eliminating the hydraulic head of ponded water."[89]

The Coal Ash Rule does include a provision for early closure of inactive coal ash ponds.[90] That provision exempts inactive ponds that close early from certain post-closure requirements such as groundwater monitoring and remedial action, where groundwater contamination is detected,[91] if they comply with specified closure standards. However, the early closure loophole has been challenged by environmental petitioners in a case pending in the D.C. Circuit.[92]

In any case, contrary to TVA's interpretation, the Coal Ash Rule does not "encourage" fast-tracking pond closure regardless of the potential threat to public health and the environment. The avowed reason EPA wants to accelerate closure is to *decrease* risks to groundwater. It is nonsensical to suggest that EPA's desire to "accelerate the closure of CCR impoundments" would prefer early closure that perpetuates groundwater contamination over safe closure.

For example, as discussed above, EPA expressly acknowledged in the Preamble that many large coal ash ponds—which EPA defined as ponds larger than 40 acres—would not be able to close by April 17, 2018.[93] EPA observed that these larger units are most likely to pose risks to human health and the environment and so warrant the protections provided by the post-

[87] DEIS Part I at 7.

[88] *See also* Att. 5, Quarles Report ¶¶ 1–6.

[89] *Id.*

[90] 40 C.F.R. § 257.100.

[91] *Id.*; *see also id.* §§ 257.104 (post-closure care requirements), 257.90–.98 (groundwater monitoring and remedial action if groundwater standards are exceeded).

[92] Att. 27, Proof Opening Brief of Environmental Petitioners at 37–41, *Util. Solid Waste Activities Group v. U.S. EPA*, No. 15-1219 (D.C. Cir. 2015).

[93] Att. 2, Coal Ash Rule, 80 Fed. Reg. at 21,409.

closure provisions of the Rule.[94] The ponds at John Sevier, Colbert and Widows Creek are all larger than 40 acres.[95]

The early closure loophole does not apply to active ponds such as John Sevier and Colbert.[96] For active ponds, the Coal Ash Rule sets time frames for closure based on evidence that most ponds will be able to close within five years.[97] However, the Rule also includes extensions for ponds that need additional time based on site-specific characteristics and other factors.[98] In short, the Coal Ash Rule anticipates that larger sites may not be able to close within the initial time frames set forth in regulations, and includes a process for obtaining additional time if necessary. Thus, timing should not function as an independent constraint where risk factors warrant closure by removal.[99]

Nevertheless, the DEIS maintains that the Coal Ash Rule requires it to fast-track closure, regardless of the risks of leaving coal ash in unlined pits connected to groundwater. TVA uses this flawed interpretation to reject clean closure at the programmatic level for large inactive ponds (Kingston, Bull Run), to fast-track closure at ponds that are active and therefore cannot take advantage of the early-closure loophole (Colbert, John Sevier), and to justify fast-tracking closure even for ponds that TVA asserts are not subject to the Rule (Allen, Widows Creek).[100]

Second, TVA repeatedly insists that "EPA asserted that either Closure-in-Place or Closure-by-Removal can be equally protective of human health and the environment if done properly."[101] However, it ignores the qualifier "if done properly," which is defined in the standards that apply to sites that have been capped in place.[102] In particular, the regulations require that TVA demonstrate that *each unit* is closed in a way that will "[c]ontrol, minimize or eliminate, to the maximum extent feasible, post-closure infiltration of liquids into the waste and releases of CCR, leachate, or contaminated run-off to the ground or surface waters or to the atmosphere."[103] These standards apply whether or not the sites close prior to April 17, 2018.

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[94] *Id.*

[95] DEIS Part 1 at 8. Regardless, Colbert is an active pond and therefore not eligible for the early closure loophole.

[96] *See* 40 C.F.R. §§ 257.100(a) (early closure loophole applies only to inactive CCR impoundments), 257.53 (defining inactive CCR impoundments).

[97] *Id.* § 257.102; Att. 2, Coal Ash Rule, 80 Fed. Reg. at 21,422–23.

[98] *Id.*

[99] *See also* Att. 5, Quarles Report at Paragraphs 7-11.

[100] As discussed in more detail in our site-specific comments, we question whether the West Ash Pond at Allen is exempt under the existing regulations. In addition, environmental petitioners have challenged the exemption of legacy ponds like Widows Creek from the Coal Ash Rule. Att. 27, Proof Opening Brief of Environmental Petitioners at 31–36, *Util. Solid Waste Activities Group v. U.S. Envtl. Prot. Agency*, No. 15-1219 (D.C. Cir. 2015).

[101] DEIS Part I at 11 (citing Att. 2, Coal Ash Rule, 80 Fed. Reg. at 21,412); *see also* DEIS Part 1 at 28 (asserting that results of EPRI reports are consistent with "EPA's technical determinations").

[102] 40 C.F.R. §§ 257.100(b)(1)(i), 257.102(d)(1)(i).

[103] *Id.*

The Preamble to the Coal Ash Rule explains that EPA added this requirement to the final rule to address commenters' concerns that a cover may not function as designed in certain circumstances.[104] EPA stated: "Under this performance standard, if the cover system results in liquids infiltration or releases of leachate from the CCR unit, *the final cover would not be an appropriate cover*."[105] Importantly, EPA's groundwater risk assessment did not model the impact of coal ash units that are sited in continuous contact with groundwater,[106] indicating that EPA never contemplated that such a situation could comply with the Rule.

Moreover, in the Preamble, EPA repeatedly acknowledges the unsuitability of karst terrain for storing coal ash.[107] Karst terrain is present throughout TVA's territory and is especially problematic at Colbert, Gallatin, Kingston and Widows Creek.[108] Yet neither EPA's groundwater modeling in the Coal Ash Rule nor, apparently, EPRI's Impact Assessment, take into account how karst features affect the proper functioning of a cover or the risk of ongoing groundwater contamination.[109]

To demonstrate compliance with the post-closure standard, TVA must show at each site that capping coal ash in place will not result "in liquids infiltration or releases of leachate."[110] Instead of making this showing, TVA concludes at a programmatic level—based on flawed and incomplete analysis—that "either closure method would have positive effects on groundwater and surface water."[111] Because TVA wrongly concludes that either choice would comply with the Coal Ash Rule (meanwhile ignoring its additional legal obligations), it artificially narrows the range of alternatives considered in the DEIS to a choice between cap-in-place or clean closure, rather than considering a reasonable range of clean closure alternatives.[112]

In sum, to the extent the purpose of the DEIS is to comply with the Coal Ash Rule, TVA should not take as a given that the fastest, cheapest route to closure is the one that will best assist TVA in accomplishing that compliance. Instead, TVA is required to define its purpose broadly

[104] Att. 2, Coal Ash Rule, 80 Fed. Reg. at 21,413.

[105] *Id.* (emphasis added).

[106] *Id.* at 21,436.

[107] *See, e.g., id.* at 21,367–68 (discussing location restriction for unstable areas).

[108] Att. 5, Quarles Report ¶ 17.

[109] Att. 2, Coal Ash Rule, 80 Fed. Reg. at 21,436 ("EPA did not consider groundwater mounding, groundwater in contact with the waste management unit, fractured rock, karst, and other complex hydrogeologic settings as these are site-specific considerations that could not be accommodated in a nationwide risk assessment."); Att. 5, Quarles Report ¶¶ 16–17; Att. 15, RERC Transcript at Day 1, p. 168 (representative of EPRI confirms that model used "alluvium as the geology of interest").

[110] Att. 2, Coal Ash Rule, 80 Fed. Reg. at 21,436.

[111] DEIS Part 1 at 28.

[112] *See also* Att. 5, Quarles Report ¶¶ 12–20.

enough to enable it to evaluate a reasonable range of alternatives to comply with the Coal Ash Rule and all other applicable laws.[113]

D. The "no action" alternative analyzed in the DEIS violates TVA's existing legal obligations, and its analysis of impacts must therefore reflect the consequences of enforcement by EPA, the State or citizens.

NEPA requires that alternatives evaluated in an EIS include the alternative of taking no action.[114] The "no action" alternative typically reflects the status quo; however, NEPA guidance further instructs that "[w]here a choice of 'no action' by the agency would result in predictable actions by others, this consequence of the 'no action' alternative should be included in the analysis."[115]

The DEIS describes the "no action" alternative as a decision to "not close any of the ash impoundments at its coal-fired power plants."[116] TVA acknowledges that this alternative is "inconsistent with its plans to convert all of its wet CCR systems to dry systems."[117] It further acknowledges that the "no action" alternative is "inconsistent with the general direction of EPA's CCR Rule."[118] TVA does not, however, acknowledge that the "no action" alternative would also be inconsistent with its obligations under the federal Clean Water Act, including the ELGs, and existing state law, as described in Section III above.

The result is an environmental analysis that concludes that either choice would be better than the illegal status quo. That status quo has already been rejected by the TVA Board of Directors.[119] TVA's description of an illegal "no action" alternative obscures the relevant comparison of the only genuine alternatives it faces: cap-in-place or variations of clean closure.

Moreover, the DEIS fails to take into account predictable actions others will likely take if TVA does not act. TVA's "no action" baseline must reflect the consequences of ongoing violation of the law: enforcement by EPA, the State or citizens, triggering the need for remedial action. In fact, the State of Tennessee has already sued TVA and issued an administrative order. If the "no action" alternative reflected this reality, it would incorporate closure into the baseline. Thus, the baseline should be closure by capping-in-place (the minimum required by the Coal Ash

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[113] Indeed, in its presentation to the Regional Energy Resource Council, EPRI acknowledges the limitations of its secret study for decision-making, stating in its presentation that "cost and regulatory direction" are factors "outside framework." Att. 18, EPRI Presentation at 74.

[114] 40 C.F.R. §§ 1502.14, 1508.25

[115] Att. 24, Forty Most Asked Questions Concerning CEQ's National Environmental Policy Act Regulations, 46 Fed. Reg. at 18,026.

[116] DEIS Part I at 11.

[117] *Id.*

[118] *Id.*

[119] As discussed throughout these comments, we question whether that is true of Alternative B, which would result in ongoing contamination of groundwater for decades.

Rule, "if done properly"), and TVA should evaluate various clean closure alternatives against it. This would allow TVA to evaluate meaningfully the environmental impacts associated with a reasonable range of alternatives.

Even if the DEIS can permissibly use an illegal status quo as the "no action" alternative, the baseline conditions described in the DEIS are not supported by the facts, as described in more detail in the discussion of individual impacts below.

E. The programmatic DEIS does not consider a reasonable range of clean closure alternatives.

The alternatives analysis is "the heart of the environmental impact statement."[120] As such, the range of alternatives explored should "sharply defin[e] the issues and provid[e] a clear basis for choice among options by the decisionmaker and the public."[121] An agency must "[r]igorously explore and objectively evaluate all reasonable alternatives."[122] In general, the range of alternatives explored should present the decision-maker and the public with more than a "binary choice."[123] This is particularly true when there is a range of reasonable alternatives "within the ambit of an existing standard,"[124] such as the closure methods available in the Coal Ash Rule.

As discussed in Section IV.C, TVA's cramped reading of the Coal Ash Rule, and its unwillingness to consider additional legal obligations, lead to a narrowly defined purpose and need: "complying" with the Coal Ash Rule as quickly as possible regardless of the extent of the risk of ground and surface water contamination. In turn, TVA defines its range of alternatives narrowly, evaluating only Alternative B (cap-in-place) and Alternative C (clean closure), the two broad closure options available in the Coal Ash Rule. It fails to consider in detail variations in the clean closure option that would reduce the impacts that, according to TVA, make it a less attractive alternative. Moreover, TVA cannot eliminate (or 'screen out') the clean closure alternative entirely at the outset of its analysis, as it does at Bull Run, Colbert, Kingston, and Widows Creek.[125]

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[120] 40 C.F.R. § 1502.14.

[121] *Id.*

[122] *Id.*

[123] *Save Our Cumberland Mountains v. Kempthorne*, 453 F.3d 334, 347 (6th Cir. 2006).

[124] *Id.*

[125] *Citizens Against Burlington, Inc. v. Busey*, 938 F.2d 190, 196 (D.C. Cir. 1991) ("[A]n agency may not define the objectives of its action in terms so unreasonably narrow that only one alternative from among the environmentally benign ones in the agency's power would accomplish the goals of the agency's action, and the EIS would become a foreordained formality.")

The range of alternatives analyzed in the DEIS is inadequate under NEPA. At a minimum, the DEIS should include detailed analysis of the following additional, reasonable clean closure alternatives at the programmatic level and at the site-specific level:[126]

1. Removal to an on-site lined landfill.

Nowhere in its description of the clean closure alternative (Alternative C) does TVA discuss the option of removing coal ash from unlined, leaking pits to an on-site lined landfill. It has previously proposed to construct lined landfills on-site at Gallatin and Kingston, and has begun construction of a lined landfill at Gallatin.[127] TVA also considered an on-site landfill in the final environmental assessment for closure of the gypsum stack at Widows Creek. It is therefore difficult to understand why this alternative has been rejected here without any explanation whatsoever.

Any on-site coal ash landfill storage would have to comply with the applicable location restrictions and design criteria in the Coal Ash Rule, including the prohibition against locating in unstable areas, as well as state law requirements.[128] For example, many of the undersigned groups have questioned whether TVA can satisfy these restrictions at the Kingston Peninsula Landfill, which is sited over karst geologic formations.[129] However, where appropriate, on-site storage would greatly reduce the short-term transportation and air quality impacts about which TVA is concerned, as well as impacts to groundwater and surface water. Analysis of an on-site storage alternative would also provide additional information regarding the potential range of costs and timing of clean closure.

2. Removal by truck to lined landfills at varying distances with different types of trucks.

Although TVA acknowledges that transportation impacts associated with removal by truck would vary based on distance to the receiving landfill, its programmatic analysis appears to be based on a single removal-by-truck scenario.[130] In turn, the calculations of air quality and greenhouse gas emissions evaluated at the programmatic level appear to be based on a single

[126] As explained in Section IV.B, TVA's programmatic approach to closure violates NEPA.

[127] Att. 26, Commissioner's Order, *In re Tenn. Valley Auth.*, Nos. SWM 10-0010, WPC 10-0135 (Tenn. Dep't of Env't & Conservation Dec. 17, 2010); Att. 28, *Kingston Coal Combustion Residuals*, TVA, https://www.tva.gov/Environment/Environmental-Stewardship/Coal-Combustion-Residuals/Kingston (last visited Mar. 8, 2016); Att. 29, Hayley Mason, *TVA Applies to Build Gallatin Landfill to Store Coal Ash*, WSMV (Mar. 27, 2014), http://www.wsmv.com/story/24971566/tva-want-to-build-gallatin-landfill-to-store-coal-ash; Att. 30, *Gallatin Coal Combustion Residuals*, TVA, https://www.tva.gov/Environment/Environmental-Stewardship/Coal-Combustion-Residuals/Gallatin (last visited Mar. 8, 2016).

[128] *See, e.g.,* 40 C.F.R. § 257.60–.70.

[129] *See* Att. 31, *Environmentalists Criticize Plan to Expand TVA Landfill*, The Tennessean (Dec. 29, 2014), http://www.tennessean.com/story/news/environment/2014/12/29/environmentalists-criticize-plan-expand-tva-landfill/21014537/.

[130] DEIS Part I at 23–24, 106–09.

removal-by-truck alternative.[131] In part, this appears to be due to TVA's exclusive reliance on the EPRI Impact Framework and Impact Analysis to evaluate air quality and greenhouse gas impacts.[132]

Restricting the removal-by-truck analysis to a single, undisclosed scenario does not provide the public or decision-makers with sufficient information to evaluate the environmental consequences of TVA's proposed action and reasonable alternatives to it.[133] As would an on-site lined landfill alternative, removing coal ash to a nearby lined landfill would have fewer air quality and transportation impacts than removing coal ash to a lined landfill at a greater distance. The cost and timing associated with long- and short-distance hauling would also differ.[134]

The DEIS should include multiple alternatives for removal by truck to explore the differences in impacts, based on distance and type of truck employed.[135] In fact, in the Environmental Assessment for the Kingston Dry Fly Ash Conversion, TVA analyzed transport to six landfills at a range of distances.[136] No less is required here.

3. Removal by barge.

TVA rejects removal by barge at the programmatic level, asserting that it would be "unfeasible."[137] It acknowledges that it has barge infrastructure in place at many of its coal-fired plants,[138] yet in a single sentence it asserts that "development of such supporting loading systems at each plant would be costly, require permits, cause schedule delays, and would result in additional environmental impacts."[139] These dubious, conclusory statements are insufficient to warrant categorical rejection of removal by barge as infeasible.

There is no explanation of what TVA means by "costly." In general, transporting material by barge is considered cheaper than by rail or truck, with reduced air quality impacts.[140] Presumably the use of barges would reduce the number and length of truck trips and other costs associated with removal by truck. It would also reduce the risk of ongoing liability for

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[131] DEIS Part I at 40, 44.

[132] *Id.* We note again the difficulty of understanding the analysis in the DEIS without access to the underlying EPRI reports upon which it is based.

[133] Att. 32, Letter from Susan Atherton, Freight Insights LLC, to Anne Davis, SELC, Re: Draft Ash Impoundment Closure Environmental Impact Statement Part 1 and 2 (DEIS), 1–5 (Mar. 6, 2016) [hereinafter Atherton Report]. The Atherton Report, and the comments and analysis contained therein, are hereby incorporated by reference.

[134] *Id*.

[135] *Id.* at 1, 4.

[136] Att. 33, TVA, Kingston Dry Fly Ash Conversion Final Environmental Assessment 35–43 (June 2010).

[137] DEIS Part 1 at 23.

[138] *Id*.

[139] *Id.*

[140] Att. 32, Atherton Report at 2-4.

groundwater and surface water contamination. Indeed, even in the transport process, spills in transport by barge historically have been far fewer than spills in transport by truck.[141]

The mere fact that an alternative requires permits does not make it infeasible. *Any* of the closure alternatives available to TVA will require permits, including NPDES permits for discharge of the water removed from the ash ponds.[142] "Scheduling delays," similarly, are not an independent constraint on alternatives; as explained in Section IV.C, TVA is not compelled to close its ash ponds by April 17, 2018. Finally, unless TVA fully analyzes this alternative,[143] the public and decision-makers cannot evaluate whether any impacts associated with removal by barge (including the alleged but undemonstrated need to transfer coal from barge to truck) would be greater than those associated with leaving coal ash in unlined leaking pits.

4. Removal by rail.

TVA appears to reject removal by rail as unreasonable at the programmatic level for "short-term closure activities associated with inactive impoundments and for low volume ash impoundments…."[144] Like its rejection of removal by barge, TVA's rejection of removal by rail as infeasible is not supported by adequate analysis.

First, the DEIS asserts, without basis, that removing "low" volumes of ash by rail is cost-prohibitive. Nowhere does it define what it means by "low" volumes of ash.[145] Without this information, it is impossible to evaluate whether removal by rail is a reasonable alternative for low volumes of ash.[146]

Second, TVA asserts, again without support, that removal by rail is infeasible for "short-term closure activities." Yet removal by rail is generally seen as *more* efficient, not less efficient, than removal by truck.[147] In any event, as discussed in detail in Section IV.C, the time constraints TVA asserts for its decisions are self-imposed, rather than required by the Coal Ash Rule, and should not be considered adequate grounds for rejecting an alternative as infeasible.

Duke Energy in North Carolina has identified removal by rail as a cost-effective and efficient way of removing coal ash to dry, lined landfills. Indeed, at its Riverbend coal ash site, Duke constructed rail lines to remove the ash.[148] A spokeswoman for Duke stated: ""Moving

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[141] Att. 32, Atherton Report at 5. From 2001-2009, there were 59 spills by barge and 1,318 spills by truck.

[142] DEIS Part I at 10 (identifying list of required permits and licenses).

[143] Att. 32, Atherton Report at 1–4.

[144] DEIS Part I at 24.

[145] *Id.* at 23–24.

[146] Att. 32, Atherton Report at 1.

[147] *Id.*at 1–4.

[148] Att. 34, Tina Terry, *Duke Energy Starts Hauling Coal Ash from Site*, WSOC (Jan. 27, 2016), http://www.wsoctv.com/news/local/duke-energy-starts-hauling-coal-ash-site/103268904.

ash by rail is much more efficient and cost effective…. In one train, we can move about as much ash as we could in 420 trucks."[149]

TVA itself employed removal by rail in the aftermath of the catastrophic dike failure at its Kingston Fossil Plant, where it relied on rail to remove and dispose of three million cubic yards (4,025,000 tons) of material 327 miles from the Kingston Fossil Plant, in 16 months, at a cost of $179,500,000.[150] Thus, for removal and rail transport of ash spilled at Kingston, on an emergency basis, TVA paid $44 per ton. For this price, TVA proposed and took the following actions:

> (1) design and construct two rail spurs adjacent to the processing area (underway); (2) load fly ash, bottom ash, and minor quantities of other small recovered debris into burrito lined gondola rail cars and/or tarped gondola rail cars with fitted liners; (3) move materials by rail to a selected permitted disposal site; (4) off-load material into trucks, as needed; and (5) transfer the material by truck and place it in a Subtitle D Class I landfill site. The empty rail cars would be cleaned inside and out to remove any residual ash before being returned to KIF for reuse.[151]

There is no discussion in the DEIS of TVA's own very relevant experience with rail transport.

TVA transported the ash from the Kingston spill to the Arrowhead Landfill in Perry County, Alabama, a landfill in an environmental justice community with repeated violations of pollution laws.[152] This must not happen again. TVA must ensure that any disposal location for it coal ash complies with laws designed to protect people from pollution, and takes into account disproportionate impacts on communities that are already burdened.

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[149] *Id.*

[150] Att. 35, TVA, Offsite Ash Disposal Options Analysis 3 (2009) http://archive.epa.gov/pesticides/region4/kingston/web/pdf/approved-offsite-ash-disposal-options-plan.pdf; Att. 36, TVA, Doc. No. EPA-AO-064, Kingston Ash Recovery Project, Completion Report: TVA Kingston Fossil Fuel Plant Release Site, Roane Cty., Tenn., 3-1 (2015), https://www.tva.gov/file_source/TVA/Site%20Content/About%20TVA/Guidelines%20and%20Reports/Kingston%20Recover%20Project/Transmittal%20Cover%20for%20Regulatory%20Submittal%20-%20Completion%20Report%20(approved).pdf; Att. 37, TVA, Doc No. EPA-AO-030A, TVA Kingston Fossil Fuel Plant Release Site On-Scene Coordinator Report Addendum for the Time-Critical Removal Action Addendum No. 01, 6-1 (2011) https://www.tva.gov/file_source/TVA/Site%20Content/About%20TVA/Guidelines%20and%20Reports/Kingston%20Recover%20Project/EPA-AO-030A-Approved-TC-OSC-Report%20Addendum.pdf.

[151] Att. 35, TVA, Offsite Ash Disposal Options Analysis 3 (2009) http://archive.epa.gov/pesticides/region4/kingston/web/pdf/approved-offsite-ash-disposal-options-plan.pdf.

[152] Att. 38, Kristen Lombardi, *Welcome to Uniontown: Arrowhead Landfill Battle a Modern Civil Rights Struggle*, NBC News (Aug. 5, 2015), http://www.nbcnews.com/news/nbcblk/epa-environmental-injustice-uniontown-n402836. Arrowhead Landfill is listed on the 2015 Public Notice of Significant Non-Compliance for Significant Industrial Users. *See* Att. 39, ADEM, Public Notice of Significant Non-Compliance for Significant Industrial Users (Feb. 2016), http://www.adem.state.al.us/newsEvents/notices/feb16/2snc.htm.

Even where TVA appears to consider removal by rail in more detail (i.e., apparently for greater quantities of ash and longer timelines), it does not provide the "substantial treatment" required by NEPA "so that reviewers may evaluate the[] comparative merits" of removal by rail versus cap-in-place and removal by truck.[153] Rather, the DEIS states conclusorily that "this mode of transport would result in substantially lower impacts as compared to trucking for air and noise emissions, traffic impacts, roadway deterioration and safety."[154] However, the analyses of air and noise emissions, traffic impacts, roadway deterioration, and safety do not evaluate in any detail the impacts associated with removal by rail.[155] Instead, those analyses appear to be based upon evaluation of a single removal-by-truck alternative.[156] The discussion of removal by rail in the DEIS is far from the "substantial treatment" required for a reasonable alternative under NEPA, and the analysis misleads the public regarding the range of potential impacts associated with various clean closure options.

5. Removal and beneficial reuse.

Santee Cooper, a publicly owned utility in South Carolina, is closing its coal ash ponds by removing the ash and trucking it to companies that will recycle it—a concept known as beneficial reuse.[157] Santee Cooper has described this combination of removal and recycling as a "triple win" for the environment, ratepayers and economic development in the state.[158] The DEIS should include analysis of an alternative that includes removing ash and engaging in and/or developing a beneficial reuse market in Tennessee, Alabama and/or Kentucky.

6. Intermodal transport.

The DEIS also fails to analyze intermodal movement as an efficient means of moving ash and fill. In intermodal transport, material is placed into a large container that can then be moved by barge, rail or truck to its ultimate destination.[159]

Finally, it is worth reiterating that each of these alternatives should be considered without regard to the artificially imposed April 17, 2018, timeline, since TVA is under no obligation to

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[153] 40 C.F.R. § 1502.14.

[154] DEIS Part I at 109.

[155] *Id.* at 40 (air quality impacts, no mention of removal by rail), 44 (greenhouse gas impacts, no mention of removal by rail), 121 (noise impacts, no mention of removal by rail), 106–09 (no detailed discussion of how removal by rail would limit truck trips, roadway deterioration or safety impacts); Att. 32, Atherton Report at 1–4.

[156] *Id*. At the January meeting of the RERC, a representative of EPRI confirmed that the Impact Assessment looked only at a single trucking alternative. Att. 15, RERC Transcript at Day 1, p. 167.

[157] Att. 40, Williard Strong, Santee Cooper, Beneficial Use of Coal Ash from Santee Cooper's Generating Stations, https://www.santeecooper.com/committed-to-south-carolina/environmental-stewardship/ccr/pdfs/other/beneficial-use-2014_environmental_annual_report_in_fall_powersource.pdf.

[158] Att. 41, Press Release, Santee Cooper, Santee Cooper Announces Plans to Recycle Ash for Beneficial Use (Nov. 19, 2013), https://www.santeecooper.com/about-santee-cooper/news-releases/news-items/santee-cooper-announces-plans-to-recycle-ash-for-beneficial-use.aspx.

[159] Att. 32, Atherton Report at 4.

meet that deadline without regard to impacts on public health and the environment. Discarding the artificially shortened timeline would significantly change the evaluation in the DEIS of removal by rail, barge and on-site lined storage at both the programmatic and site-specific level.

F. The analysis of impacts in the programmatic DEIS is based on unsupported or inaccurate assumptions.

NEPA requires that an environmental impact statement "provide full and fair discussion of significant environmental impacts" and that it be "be supported by evidence that the agency has made the necessary environmental analyses."[160] The affected environment must be described in a meaningful way, and impacts of various alternatives compared relative to it.[161] "Verbose descriptions of the affected environment are themselves no measure of the adequacy of an environmental impact statement."[162]

The discussion of environmental impacts "forms the scientific and analytic basis for the comparisons of [alternatives]."[163] In the absence of a full and fair discussion of impacts and adequate evidence of analysis, an EIS fails to serve its purpose to "inform decisionmakers and the public of the reasonable alternatives which would avoid or minimize adverse impacts or enhance the quality of the human environment."[164]

1. TVA provides no support for the cost and timing estimates in the DEIS, and the experience of other utilities demonstrates that TVA's estimates are inflated.

In the programmatic DEIS, TVA provides cost and timing estimates for Alternative B (Closure-in-Place) and Alternative C (Closure by Removal) as follows:[165]

Alternative B (Closure-in-Place)	Alternative C (Closure by Removal)
10 to 95 months per site	12 months to 70 years per site
$3.5 million to $200 million per site	$15 million to $2.7 billion per site

TVA cites no supporting documentation or analysis for these estimates, and none is provided in the section of the DEIS that lists literature cited. In fact, with respect to the cost

[160] 40 C.F.R. § 1502.1.
[161] *Id.* § 1502.15.
[162] *Id.*
[163] *Id.* § 1502.16.
[164] *Id.* § 1502.1.
[165] DEIS Part I at 12, 20–21.

estimates, the DEIS admits that they are "preliminary."[166] Nevertheless, TVA relies on "excessive cost" and "schedule" as bases for rejecting several clean closure options.[167]

The experience and estimates of peer utilities in the region contradict TVA's unsupported assertions regarding the cost of clean closure. Below is a comparison of the projected costs for clean closure by Duke Energy (North and South Carolina), Santee Cooper (South Carolina), and TVA:

	Cost (Millions)	**Tons (Millions)[168]**	**$/ton**
Santee Cooper	$220	11	$20
Duke Energy	$8,000	140	$57
TVA Allen West	$25	.3	$100
TVA Bull Run	$339	3.5	$97
TVA Colbert Pond 4	$310	3.2	$97
TVA John Sevier	$15	.1	$103
TVA Kingston	$79	.7	$113
TVA Widows Creek	$2,700	25	$108

Santee Cooper, a publicly owned utility in South Carolina, has estimated it will cost $220 million to remove 11 million tons of ash from three sites.[169] Duke Energy has estimated it will cost $6 to $8 billion to remove 140 million tons of coal ash to dry, lined storage.[170] In our view, the estimates of Santee Cooper are more reliable because the utility has already performed significant work in the clean closure process.

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[166] *Id.*

[167] *Id.* at 24–26; *see* Section IV.E above (Alternatives).

[168] We apply the conversion factor one cubic yard equals one ton. This average conversion factor was used by EPA in its Regulatory Impact Analysis for the final Coal Ash Rule. *See* Att. 42, U.S. EPA, Appendices for Regulatory Impact Analysis for Coal Combustion Residuals (CCR) Landfills and Surface Impoundments at Electric Utility Plants, App. S, S-102 (Oct. 2014).

[169] Att. 43, Joel Allen, *Coal Ash from Conway Power Plant to be Turned into Concrete*, WPDE (Feb. 10, 2015), http://wpde.com/news/local/coal-ash-from-conway-power-plant-to-be-turned-into-concrete?id=1162171;

Att. 44, Eric Connor, *Coal Ash Cleanup: Someone Will Pay; Will it be Customers?*, Greenville Online (Apr. 28, 2014), http://www.greenvilleonline.com/story/news/local/2014/04/28/question-dukes-numbers-cost-cleanup/8350057/.

[170] Att. 45, Institute for Energy Economics & Financial Analysis, Memo on Duke Energy and Costs of Coal Ash Cleanup (June 10, 2014), http://www.ieefa.org/wp-content/uploads/2014/06/IEEFA-Duke-Study-Summary-Final-6-10-141.pdf; Att. 46, Duke Energy, Duke Energy Coal Plants and Ash Management 2 (Dec. 14, 2015), http://www.duke-energy.com/pdfs/duke-energy-ash-metrics.pdf.

In any case, TVA's estimates are nearly twice the cost per ton in Duke's projections, and five times the cost per ton estimated or experienced by Santee Cooper. Moreover, as discussed in Section IV.E, Santee Cooper has committed to recycling its ash for beneficial reuse, a plan it describes as a "triple win" for the environment, ratepayers and economic development.[171]

TVA's inflated estimates regarding the time it will take to accomplish clean closure are also contradicted by the experience of other utilities in the region. Santee Cooper is on track to clean close three coal ponds totaling 11 million tons in 10 years, or 1.1 million tons per year (approximately 367,000 tons per site). The utility has already begun the work and is ahead of schedule, planning to finish removing the ash by truck in 2020.[172]

Similarly, Duke has stated that it is on track to meet its 2019 deadline for excavation and removal of ash from its storage ponds at Riverbend.[173] Removal from the Riverbend facility, which contains 4.5 million tons of coal ash, began in May 2015. [174] Thus, at Riverbend, Duke is projecting that it will remove roughly one million tons per year.[175]

TVA's time estimates are nearly three times what Santee Cooper and Duke have reported from actual experience. TVA estimates that it will take 70 years to remove coal ash ponds containing million tons of coal ash at Widows Creek—an average of .36 million tons per year.[176] Similarly, at Bull Run, TVA estimates that it will take 10 years to remove 3.5 million tons of coal ash—an average of .35 million tons per year.[177] TVA provides no evidence to support these estimates in the DEIS, and the experience of peer utilities in the region suggests that TVA's estimates are significantly inflated. Moreover, to the extent these estimates are based on the flawed alternatives and transportation analyses in the DEIS, they do not compare reasonable alternatives, such as different trucking options, rail and barge, which might substantially decrease the amount of time required to clean close a site.[178]

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[171] Att. 41, Press Release, Santee Cooper, Santee Cooper Announces Plans to Recycle Ash for Beneficial Use (Nov. 19, 2013), https://www.santeecooper.com/about-santee-cooper/news-releases/news-items/santee-cooper-announces-plans-to-recycle-ash-for-beneficial-use.aspx.

[172] *Id.*

[173] Att. 47, Duke Energy, Riverbend Steam Station Coal Ash Excavation Plan 8 (Nov. 2015), https://www.duke-energy.com/pdfs/am-riverbend-excavation-plan.pdf.

[174] Att. 46, Duke Energy, Duke Energy Coal Plants and Ash Management 2 (Dec. 14, 2015), http://www.duke-energy.com/pdfs/duke-energy-ash-metrics.pdf.

[175] Att. 48, Press Release, Duke Energy, Coal Ash Management Progress: Riverbend Coal Ash Excavation is Under Way to Fully Lined Landfill (May 21, 2015), http://www.duke-energy.com/news/releases/2015052101.asp.

[176] Widows Creek DEIS at 7. For the purposes of this analysis, we will treat cubic yards and tons as roughly equivalent. *See* U.S. EPA, Appendices for Regulatory Impact Analysis for Coal Combustion Residuals (CCR) Landfills and Surface Impoundments at Electric Utility Plants, app. S, S-102 (Oct. 2014).

[177] Bull Run DEIS at 8–9.

[178] *See* Section IV.F.7 (Transportation).

In addition, it appears that the cost estimates for Alternative B (Closure-in-Place) do not include estimates for future legal liability discussed in Section III. These costs could include litigation costs, damages and civil penalties. For violations of the Clean Water Act, for example, each separate violation (including permit violations and unpermitted discharges) is subject to a penalty of up to $37,500 per day.[179]

TVA's future legal liability is by no means hypothetical: the State of Tennessee has filed a verified complaint in state court charging TVA with violating state water pollution laws by storing ash in an unlined pit at Gallatin Fossil Plant that is connected to ground and surface water.[180] The State of Tennessee has also issued an administrative order to ensure that TVA complies with state solid waste laws in addition to the minimum requirements established by the federal Coal Ash Rule.[181] That order expressly identifies the possibility that TVA will select a closure method under the Coal Ash Rule that does not comply with state requirements, and warns that it does so at its own risk.[182] In addition, TVA's existing permits issued pursuant to the federal Clean Water Act prohibit the utility from contaminating groundwater.[183]

TVA must include an appropriate risk adder for Alternative B to reflect the costs of ongoing contamination and future liability associated with this alternative.

2. The DEIS fails to analyze fully and fairly the groundwater impacts associated with capping coal ash in place.

Although the central purpose of TVA's proposed action is to comply with the Coal Ash Rule (which, as explained in Section III, provides minimum national standards to protect the public from groundwater and surface water contamination), the analysis of groundwater impacts in the programmatic DEIS is surprisingly brief—a mere seven pages.[184] The analysis of groundwater impacts is flawed in three key ways. First, the DEIS fails to describe accurately the baseline conditions against which to evaluate Alternatives B and C. Second, the DEIS fails to evaluate fully whether capping in place can be done "properly" under the Coal Ash Rule and state law at the specific sites where TVA proposes to employ Alternative B. Third, the DEIS

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[179] 33 U.S.C. § 1319(d) (Availability of Civil Monetary Penalties); 40 C.F.R. § 19.4 (Adjustment of Civil Monetary Penalties for Inflation).

[180] Att. 11, Complaint, *State v. TVA*, No.15-23-II (Tenn. Ch. Ct. 20th Div. 2015), http://attorneygeneral.tn.gov/cases/tva/tvacomplaint.pdf.

[181] Att. 12, Commissioner's Order, *In re Tenn. Valley Auth.*, No. OGC015-0177 (Tenn. Dep't of Env't & Conservation Aug. 8, 2015), https://tn.gov/assets/entities/environment/attachments/TVA_Order_8-6-15.pdf.

[182] *Id.* at 9.

[183] *See, e.g,,* Att. 5, Quarles Report Ex. 6, Tenn. Dep't of Envt. & Conservation, Cumberland Fossil Plant, NPDES Permit No. TN0005789, at 4 ("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."); *Yadkin Riverkeeper, Inc. v. Duke Energy Carolinas, LLC*, No. 1:14-cv-753, 2015 WL 6157706 (M.D.N.C. Oct. 20, 2015) (denying Duke Energy's 12(b)(6) motion to dismiss a claim premised on violation of a NPDES permit containing "removed substances" provision).

[184] DEIS Part I at 53–59.

fails to analyze adequately the groundwater effects of its proposal under Alternative B merely to decant ash, without dewatering.

If TVA were to perform an adequate analysis of groundwater impacts—as it must under NEPA—it must then conclude that Alternative B does not satisfy even the unreasonably narrow purpose of complying with the Coal Ash Rule. Nor does Alternative B enable TVA to comply with the full range of its other legal obligations.

a. The DEIS fails to disclose and analyze accurate baseline conditions that affect potential groundwater contamination.

TVA's analysis of groundwater impacts is based almost entirely on the results of an undisclosed Impact Assessment performed by EPRI.[185] The Impact Assessment, in turn, is based upon a "hypothetical" coal ash pond in Tennessee—not the actual environment that exists at each coal ash pond in TVA's system in Tennessee, Alabama and Kentucky.[186]

TVA's reliance on the EPRI Impact Assessment, rather than the actual baseline conditions at each of its coal ash ponds, fails to satisfy TVA's obligation to evaluate impacts fully and fairly.[187] "NEPA requires that the agency provide the data on which it bases its environmental analysis. Such analyses must occur before the proposed action is approved, not afterward."[188] The DEIS fails to meet this standard.

First, there is no discussion of the extent of existing groundwater contamination at or near TVA's coal ash ponds in the programmatic EIS. Environmental groups provide extensive documentation of existing groundwater contamination in the site-specific comments addressing Part II of the DEIS, and that documentation is incorporated here by reference. Groundwater at every site within TVA's system is contaminated by the heavy metals found in coal ash.[189] Despite TVA's failure to describe accurately the baseline contamination system-wide, the DEIS decides at the programmatic level that capping in place is the preferred remedy for large inactive coal ash ponds, including Widows Creek.

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[185] *Id.* at 58–59.

[186] *Id.* at 27 (EPRI analysis uses "hypothetical "coal ash pond with undefined features); Att. 15, RERC Transcript at Day 1, p.171 (EPRI representative states, with respect to groundwater modeling, "…I'm going to keep stressing these are examples. They aren't based on any real site.")

[187] Att. 5, Quarles Report ¶¶ 35–42; 40 C.F.R. § 1502.15 ("Verbose descriptions of the affected environment are themselves no measure of the adequacy of an environmental impact statement.").

[188] *N. Plains Res. Council, Inc. v. Surface Transp. Bd*., 668 F.3d 1067, 1083 (9th Cir. 2011) (citations omitted).

[189] Att. 49, Envtl. Integrity Project, Groundwater Contaminated by Tennessee Valley Authority Coal Ash, (Nov. 2013) [hereinafter EIP Report]; Att. 50, Envtl. Integrity Project, EIP Update, Groundwater Contaminated by Tennessee Valley Authority Coal Ash (Nov. 2014) [hereinafter EIP Update Report].

Second, as discussed in Section IV.B, TVA admits in the DEIS that it has not identified the location of the uppermost aquifer at each of its sites.[190] Without this information, it is not possible to determine whether ash is in continuous contact with groundwater.[191] TVA also appears to be using an improperly narrow definition of "usable" groundwater to make its determinations regarding the location of the uppermost aquifer, in violation of the Coal Ash Rule and Tennessee law.[192] Determining whether ash is within the water table is "normally the fundamental issue taken into account when decisions are made regarding past disposal at remediation sites."[193]

Because groundwater is a public resource, TVA must determine whether ash is in contact with groundwater at each site, and must obtain permission from the state with jurisdiction over the groundwater before it decides to leave the ash in place to pollute for decades to come.[194] In addition, it is worth noting that in Tennessee, the state Solid Waste Disposal Act requires landfills to be located 10 feet above the uppermost aquifer in some circumstances, rather than the five feet required by the federal Coal Ash Rule.[195]

Third, TVA also admits in the DEIS that it has not determined the directional flows of groundwater at each site, even though such information, coupled with information regarding the uppermost aquifer, is critical to determining the potential for contaminated groundwater to interact with surface water.[196] Finally, TVA makes no mention of specific hydrogeologic conditions at each site, such as karst features, that further increase the risk and extent of connectivity between ash and groundwater. Although many, if not most, of the sites in TVA territory have significant karst features,[197] the EPRI Impact Assessment assumed alluvial rather than karst bedrock characteristics prevailed.[198] The State of Tennessee regulates the siting of landfills in karst terrain, and requires demonstrations that the landfill will not cause significant degradation of groundwater quality or pose a significant risk of surface collapse.[199]

Given the close proximity of TVA CCR disposal areas to rivers and the typical soil conditions in those areas, very shallow groundwater conditions will prevail. Further, because surface impoundments were constructed without liners in low-lying areas, groundwater

[190] DEIS Part I at 57.

[191] Att. 5, Quarles Report ¶¶ 35–42.

[192] Att. 5, Quarles Report ¶¶ 48–57.

[193] Att. 16, RT Report at 4.

[194] *Id.*; *see also* Att. 15, RERC Transcript at Day 1, p. 182 (EPRI representative and groundwater modeler states, "Coal ash leaches for a long time. And we've had trouble ever coming up with a finite number, so don't quote me on 100 years. But yes, coal ash leaches for a long time.")

[195] Att. 5, Quarles Report Ex. 14, Tenn. Rule 0400-11-01-.4, Solid Waste Processing and Disposal § 4(a)-(c).

[196] DEIS Part I at 57; Att. 5, Quarles Report ¶¶ 36–38.

[197] Att. 5, Quarles Report ¶¶ 17–18.

[198] Att. 15, RERC Transcript at Day 1, p. 168.

[199] Att. 5, Quarles Report Ex. 14, Tenn. Rule 0400-11-01-.4, Solid Waste Processing and Disposal § 2(q).

connectivity to the wastes is probable.[200] The extent of contamination of ground and surface waters will vary by site, based on these site-specific features.[201]

b. TVA completely fails to analyze whether its proposal to cap coal ash in place can be done "properly" according to the Coal Ash Rule and state law requirements.

As discussed in Section IV.C (Purpose and Need) of these comments, the analysis in the DEIS fails to take into account TVA's obligation to ensure that closure in place is done properly in order to protect public health and the environment. TVA must meet all of the performance standards in the Coal Ash Rule, including the requirement to "[c]ontrol, minimize or eliminate, to the maximum extent feasible, post-closure infiltration of liquids into the waste and releases of CCR, leachate, or contaminated run-off to the ground or surface waters or to the atmosphere."[202] Similarly, TVA is obligated to meet state law requirements, such as Tennessee's solid waste rules.[203] Yet as described in Section IV.B, TVA completely fails to discuss how capping ash that is in continuous contact with groundwater meets these performance standards.[204] In part, this failure stems from TVA's inaccurate description of baseline conditions present at each site, as discussed in Sections IV.B and IV.D (Programmatic and Baseline).

Even in the "hypothetical" analysis performed by EPRI, TVA fails to address the issue of lateral contamination adequately. Nor could it do so in a programmatic approach, since the extent of contamination will vary from site to site, based on the key factors discussed in Sections IV.A and D (Programmatic and Baseline) of these comments.

Moreover, the conclusion of the "hypothetical" analysis in EPRI's undisclosed Impact Assessment—that groundwater contamination will improve even when ash is in continuous contact with groundwater—is directly contradicted by a previous EPRI study, which found that capping an unlined landfill would have *no* beneficial effect on groundwater contamination in such circumstances.[205] It is further contradicted by TVA's own studies at the Gallatin ash pond, which concluded that capping in place "would not yield a significant reduction in risks to the groundwater transition zone" into the river, and that groundwater improvement into the future with the cap (versus an uncapped scenario) would be "minimal."[206]

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[200] Att. 5, Quarles Report ¶ 15, Ex. 3.

[201] *Id.* ¶¶ 17–18; *see also* section IV.B (Programmatic Approach).

[202] *Id.*

[203] Att. 5, Quarles Report Ex. 14, Tenn. Rules Chapter 0400-11-01-.04.

[204] Att. 5, Quarles Report ¶¶ 12–20.

[205] *Id.* ¶¶ 30–34, Ex. 8 (EPRI, Cap Report, Evaluation and Modeling of Cap Alternatives at Three Unlined Coal Ash Impoundments (Sept. 2001)).

[206] *Id.* ¶ 30, Ex. 7, TVA Arcadis at iv, 18, and 20.

In sum, the DEIS provides no evidence that capping in place is an effective closure method where waste remains saturated with CCR liquids or in contact with groundwater. The evidence that exists—much of it generated by TVA and EPRI themselves—suggests that it is not.

Other utilities and state environmental agencies have reached the same conclusion. In a hearing before the South Carolina Public Service Commission, for example, a representative of Duke Energy explained its reasons for selecting clean closure by removal at its Robinson coal ash ponds. He stated, "Third, groundwater is protected. Ash will be removed and placed in an engineered landfill, segregated from groundwater."[207] Similarly, the Maryland Department of Natural Resources recently asked the Virginia Department of Environmental Quality to consider requiring Dominion, at the Possum Point Power Station, to "transport[]the dry coal ash to a properly constructed, lined facility located away from rivers and streams" because it would "greatly reduce the potential for groundwater and surface water contamination."[208]

c. TVA fails to analyze the impacts on groundwater of its proposal merely to decant rather than dewater coal ash prior to capping.

The description of Alternative B in the DEIS indicates that TVA plans to decant water from coal ash ponds, but not that it will fully dewater the ash.[209] Dewatering ash includes removing what is known as "pore" water from ash that has been saturated.[210] Complete dewatering would also include ensuring that ash is not in continuous contact with groundwater.[211]

The EPRI Impact Assessment, and, in turn, the DEIS, rely on a substantial reduction of the hydraulic head to protect groundwater.[212] However, water that remains within the CCR after decanting—including ash pore water from slurried liquids, leachate, and/or groundwater, as examples—will continue to mound the groundwater and increase the hydraulic gradient (i.e. slope) of the uppermost aquifer.[213] As a result, the analyses performed by EPRI and TVA, which assumed significantly lower hydraulic head conditions to justify closure-in-place, will not achieve those results by just decanting the water. In addition, in conversation with our consulting Professional Geologist, Mark Quarles, EPA confirmed that complete dewatering—not

[207] Att. 51, Transcript, Ex Parte Hearing before Public Service Commission of South Carolina, p. 14, lns. 14-17.

[208] Att. 52, Letter from Mark Belton, Secretary, Md. Dep't of Nat. Res., to Susan Mackert, Va. Dep't of Envtl. Quality, Re: Comments on Draft VPDES Permit No. VA0002071 for Possum Point Power Station (Jan. 11, 2016).

[209] DEIS Part I at 12–19; Att. 5, Quarles Report ¶ 21.

[210] Att. 5, Quarles Report ¶¶ 23–24.

[211] *Id.*

[212] DEIS Part I at 58–59; Att. 5, Quarles Report ¶ 21.

[213] Att. 5, Quarles Report ¶¶ 21–24.

just decanting—is required in order to achieve the groundwater benefits intended by the Coal Ash Rule.[214]

3. The analysis of surface water impacts in the DEIS is incomplete and fails to discuss mitigation measures for coal ash contamination.

The analysis of impacts to surface water in the DEIS is even more cursory than its discussion of groundwater impacts.[215] First, despite the significant risk that closure in place would allow surface water contamination to continue, due to incomplete dewatering and a hydrological connection between groundwater and surface water (see Section IV.F.2 (Groundwater)), the DEIS concludes that "infiltration would be *de minimis*."[216] Again, this flawed conclusion is premised on an incomplete and inaccurate characterization of baseline conditions, and EPRI's undisclosed and inaccessible Impact Assessment.[217]

Second, TVA proposes to discharge untreated liquids from decanting and dewatering into rivers and streams.[218] Yet its analysis fails to account for the fact that TVA's existing NPDES permits do not contain numerical limits for discharge of key coal ash constituents, including heavy metals such as arsenic.[219] Nor do TVA's permits require it to sample for such constituents.

Decanting and discharging this waste water into rivers, streams, and reservoirs without proper treatment will transfer contamination from one location and medium to another with undetermined, cumulative effects.[220] Decanted and dewatered liquids that are discharged without treatment into receiving streams will contain constituents that are not included in an NPDES permit, some of which have been documented to harm receiving surface waters. Such constituents include arsenic, boron, sulfate, and selenium, as examples.[221] Despite this very real risk of surface water contamination, the DEIS contains only a non-committal, offhand mention of the possibility of "additional treatment."[222] This discussion falls far short of a commitment to appropriate mitigation of significant environmental impacts required by NEPA.[223]

Moreover, the analysis in the DEIS apparently fails to take into account regulation under the ELGs discussed in Section III. In North Carolina, the State has developed technology-based

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[214] *Id.* ¶ 24.

[215] DEIS Part I at 60–69.

[216] *Id.* at 68.

[217] *Id.*; *see also* Section IV.F.2 (Groundwater).

[218] DEIS Part I at 67.

[219] Att. 5, Quarles Report ¶¶ 28-29, Exs. 4–6.

[220] *Id.* ¶ 28.

[221] *Id.*¶ 29, Exs. 4–6.

[222] DEIS Part I at 67.

[223] 40 C.F.R. § 1502.14.

effluent limitations (TBELs) for coal ash indicator pollutants (arsenic, selenium and nitrate/nitrite) for the NPDES permit at Riverbend Steam Station.[224] The state agencies that regulate TVA's coal plants are required to develop TBELs for these sites as well.

Third, the DEIS does not discuss any efforts by TVA to determine the presence or extent of solid coal combustion wastes in adjacent rivers and streams. Sampling by third parties has indicated a substantial amount of coal ash in sediments near TVA's Gallatin coal-fired plant.[225] Further, the DEIS does not include any discussion about the potential effects of liquid and solid CCRs that are influent to receiving streams in the form of groundwater discharges, accumulated sediments, sediment pore water, surface water discharges from impoundments, or CCR solids that are lying in river sediment. Although TVA vaguely discusses a groundwater monitoring mitigation measure on page 19 of the DEIS, groundwater monitoring is just one component of a comprehensive sampling program. Comprehensive sampling is a critical component of any mitigation measure proposed for significant impacts to surface waters.

Fourth, TVA provides no analysis of site stability, stating simply that "TVA has evaluated all of their ash impoundments and they are static stable under designed loads."[226] The berms and dikes need to be evaluated with respect to stability so that there is no potential for leachate/liquid release due to vertical construction of dikes on waste materials.[227]

4. The analysis of impacts to wildlife, threatened and endangered species, and aquatic ecology is deficient because it relies on a flawed groundwater and surface water analysis.

The DEIS applies its flawed groundwater and surface water analysis to evaluate the potential impacts on wildlife, threatened and endangered species and aquatic ecology.[228] In its discussion of aquatic ecology, for example, TVA simply states that "waste water discharges during decanting will meet existing permit limits…."[229] In its discussion of impacts to endangered and threatened species, TVA says nothing about potential impacts to aquatic species, despite listing at least 11 of them "on or very near TVA generating facility reservations."[230]

As discussed above, existing permits do not establish limits for key coal ash parameters and therefore will do nothing to prevent extensive surface water pollution. In addition, TVA has not identified any method of pre-treatment before discharging decanted water. Because

[224] Att. 53, N.C. Dep't of Envtl. Quality, Riverbend Steam Station, NPDES Permit No. NC0004961, at 4 (Feb. 12, 2016).

[225] Att. 5, Quarles Report ¶ 47.

[226] DEIS Part I at 52.

[227] Att. 16, RT Report at 3.

[228] DEIS Part I at 77–79, 81–82, 83–44.

[229] *Id.* at 81.

[230] *Id.* at 83.

groundwater and surface water impacts are likely to be much more significant than TVA acknowledges in the DEIS, it must provide new analysis of potential impacts on aquatic ecology, wildlife and threatened and endangered species as well, and it must propose reasonable mitigation measures, such as clean closure and pretreatment of decanted water and pore water.

In a letter from the Maryland Department of Natural Resources to the Virginia Department of Environmental Quality regarding the Possum Point Power Station in Virginia, the State of Maryland provided extensive documentation of impacts of coal ash pollution on aquatic life and fisheries.[231] In particular, the letter documents the potential for selenium, a constituent of coal ash, to bioaccumulate in aquatic food chains.[232]

5. TVA's analysis of floodplain impacts is incomplete because it fails to evaluate the potential for catastrophic waste washout in flood conditions.

In the DEIS, TVA admits that if it caps coal ash in place, "flood events greater than the 500 year flood could occur that could inundate the ash impoundments…."[233] As a preliminary matter, TVA admits that it has not determined the crest elevations for several sites.[234] Thus, it is arbitrary to limit the analysis to 500 year flood events at the programmatic level.

In any case, analysis of the crest elevation of coal ash impoundments does not provide a full evaluation of the risk of waste washout.[235] During a flood event, the water is moving faster along the berm. If not properly constructed, the berm can be washed out, causing the waste to be released and carried away with the flooding water. When the water velocity reaches one foot per second, scouring can begin. If scour occurs, the height of the berm is irrelevant because the berm will be washed out from the bottom. TVA provides no analysis of the risk of waste washout, yet it minimizes the potential impact of floodplain threats to surface water, stating that the "downstream extent of ash deposition in the receiving stream would be expected to be less than existing conditions."[236]

This superficial analysis is inadequate. Before locating a facility such as a landfill immediately adjacent to major water bodies and rivers, a detailed analysis of factors such as flood flow and the need for scour protection is required.[237] Additionally, TVA should have

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[231] Att. 52, Letter from Mark Belton, Secretary, Md. Dep't of Nat. Res., to Susan Mackert, Va. Dep't of Envtl. Quality, Re: Comments on Draft VPDES Permit No. VA0002071 for Possum Point Power Station (Jan. 11, 2016).

[232] *Id.*

[233] DEIS Part I at 71.

[234] *Id.* at 70.

[235] Att. 16, RT Report at 2–3.

[236] DEIS Part I at 71; Att. 16, RT Report at 2–3, Ex. B.

[237] Att. 16, RT Report at 2–3; *see also* 40 C.F.R. § 257.3-1 (requiring demonstration that coal ash impoundments and new landfills not be located in floodplains).

included a clear demonstration by a licensed professional engineer that ongoing operations will not cause catastrophic "waste washout."[238]

6. The DEIS ignores significant impacts to wetlands.

Several of TVA's coal ash ponds are located in or adjacent to wetlands, including the ponds at Colbert and Widows Creek.[239] The DEIS asserts that these wetlands "are not under the jurisdiction of the USACE and are not considered 'jurisdictional waters' subject to regulation under the CWA."[240] TVA appears to be basing this analysis on the exemption of "waste treatment systems" from the definition of "waters of the United States" in the Clean Water Rule.[241] TVA concludes that there will be no significant impacts to wetlands.

The "waste treatment systems" exemption cited by TVA does not apply to unlined pits that are intended to dispose of coal ash permanently, such as the facilities TVA proposes in Alternative B.[242] The Coal Ash Rule generally prohibits the siting of new landfills and new or existing surface impoundments in wetlands unless specified conditions are met.[243] Moreover, TVA fails entirely to analyze state water quality and solid waste laws, such as those of the State of Tennessee, that prohibit or otherwise constrain the siting of disposal facilities in wetlands.[244] In its discussion of Alternative B, the DEIS also entirely fails to analyze impacts to wetlands located adjacent to the pits TVA proposes to use for disposal. Nor does the DEIS consider mitigation of impacts to wetlands, such as restoration after removal of coal ash.[245] TVA must adequately analyze impacts to wetlands and propose mitigation measures.

7. The transportation analysis in the DEIS fails to analyze reasonable alternatives and to provide basic information regarding key assumptions, and thus fails to examine the potential impacts of clean closure.

As discussed in Section IV.E, TVA fails to analyze a reasonable range of clean closure alternatives in the DEIS, including removal by barge or rail and removal to an on-site landfill. Instead, TVA appears to analyze a single removal-by-truck scenario in its transportation analysis.[246] The transportation analysis in EPRI's Impact Assessment—upon which we believe the DEIS analysis is solely based—is also based entirely on a single removal-by-truck

[238] *Id.*

[239] Att. 16, RT Report at 6–7.

[240] DEIS Part I at 85.

[241] *Id.* The Clean Water Rule has been stayed by the United States Court of Appeals for the Sixth Circuit pending resolution of litigation. *In re EPA*, 803 F.3d 804 (6th Cir. 2015).

[242] Att. 16, RT Report at 3.

[243] 40 C.F.R. § 257.61.

[244] Att. 16, RT Report at 2; Tenn. Rule 0400-11-01-.04(p).

[245] Att. 16, RT Report at 3.

[246] DEIS Part I at 103–09.

scenario.[247] At a meeting of the TVA Regional Energy Resource Council in January, a representative of EPRI stated that TVA expressly defined the inputs to be limited to a single truck option using 15-cubic-yard trucks.[248]

It is inappropriate to treat all sites the same when analyzing the modes of transportation. Because there are so many variables at each site—the volume of material, the distance to any landfill, the way coal is brought into that facility, and how that facility is moving to dry handling, among other things—the analysis must be site-specific.[249] The failure to examine a reasonable range of alternatives alone renders the transportation analysis—and all of the analyses in the DEIS that incorporate its assumptions—deficient.

Even within the limited removal-by truck analysis provided in the DEIS, TVA omits information needed to evaluate its conclusions.[250] Key information that is missing includes assumptions regarding vehicle-miles traveled for each site, reasons for limiting the type of truck to tandem dump truck, and the effect of these assumptions on traffic impacts and rates of accidents.[251] In addition, the DEIS fails to assess the potential for efficiency gains based on pairing trips for import of fill and export of coal ash during the removal process.[252]

8. Flaws in the transportation analysis, and the lack of other publicly available evidence to support TVA's conclusions, lead to deficiencies in the analysis of air quality, greenhouse gases, and noise.

The noise analysis in the DEIS appears to be based entirely on the conclusions of TVA's flawed and unsupported transportation analysis (see Sections IV.E (Alternatives) and IV.F.7 (Transporation) above).[253] Fundamental deficiencies in the transportation analysis taint the noise analysis.

The basis for the analyses of air quality impacts and greenhouse gas impacts in the DEIS is murky. On the one hand, the conclusions in these sections appear to be exclusively based on EPRI's Impact Framework and Impact Analysis, which have not been provided to the public,[254] nor have the underlying data on which the EPRI studies were based. As we discuss above in Section IV.A, TVA cannot rely on non-public information to support its conclusions in the DEIS.

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[247] Att. 15, RERC Transcript at Day 1, p. 167.

[248] *Id.*

[249] Att. 32, Atherton Report at 1.

[250] *Id.*

[251] DEIS Part I at 103–09; Att. 32, Atherton Report at 1–5.

[252] Att. 32, Atherton Report at 2.

[253] DEIS Part I at 120–22.

[254] *See id.* at 39–40, 43–44.

Although it is not clear from the DEIS, it is possible that TVA relied in part on its flawed and inadequate transportation analysis for its conclusions regarding air quality and greenhouse gas impacts. It is certainly the case that these analyses do not reflect any detailed consideration of alternatives that would reduce air emissions, such as removal by rail. To the extent that TVA relies on its transportation analysis for its assessments of air quality and greenhouse gases, it must revisit these analyses and provide adequate information, supported assumptions, and a reasonable range of alternatives, as discussed in Sections IV.E (Alternatives) and IV.F.7 (Transportation) above.

In addition, TVA overstates the impacts of fugitive dust emissions associated with clean closure.[255] These impacts can be mitigated by a commitment to "no visible emissions" and use of a control plan for fugitive dust, including dust suppression agents.[256]

9. The public safety analysis is unsupported by any publicly available evidence.

In its analysis of impacts on public safety, the DEIS focuses exclusively on worker safety.[257] TVA concludes that Alternative C (Closure by Removal) would have a "much greater" risk of impacts to workers than Alternative B (Closure in Place).[258] It bases this conclusion on two sources: (1) a single newspaper article reporting a single death of an employee at a coal ash site in Ohio; and (2) the undisclosed and inaccessible EPRI Impact Assessment.[259] Neither of these warrants the conclusion that risks would be "much greater" under Alternative C.

First, a newspaper report of a single death of a worker at a coal ash pond in 2006 does not demonstrate that closure by removal poses a greater risk. Moreover, the death reported in the article occurred at a coal ash pond that was continuing to operate—a situation that surely includes operating conditions that differ from a pond that is in the process of closing.[260]

Second, the DEIS asserts that the EPRI Impact Assessment found that risks associated with Alternative C would be 50 percent greater than those associated with Alternative B.[261] Without access to the underlying data and assumptions nor to the analysis in the EPRI Impact Assessment,[262] it is impossible for the public to evaluate or credit that conclusion. In addition,

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[255] Att. 16, RT Report at 4–5, Ex. C.

[256] *Id.*

[257] DEIS Part I at 126–28.

[258] *Id.* at 128.

[259] *Id.* at 127–28.

[260] *See* Att. 54, Wendy Mitchell, *Bracken County Man Killed in Ash Pond Slide at DP&L*, The Ledger Independent (July 25, 2006), http://www.maysville-online.com/news/bracken-county-man-killed-in-ash-pond-slide-at-dp/article_12612753-294d-536b-b0b0-7454ef814eae.html (noting that ash ponds on the site are excavated daily so that they can be reused).

[261] DEIS Part I at 127.

[262] *See* Section IV.A.

the DEIS states, without support, that "extensive off-site trucking of CCR material would represent an increased risk to worker safety and the safety of the traveling public as a result of higher accident rates…."[263] Moreover, to the extent that this relies on the flawed alternatives and transportation analysis in the DEIS, it overstates the accident rates associated with Alternative C (see Section IV.F.7 (Transportation)) and does not consider other clean closure alternatives, such as removal by rail or barge or transport to an on-site landfill.

Regional experience with removal by truck similarly suggests that TVA's public safety analysis overstates the risks associated with Alternative C. In North Carolina, Duke Energy has employed trucks to remove ash from its Asheville site.[264] Nearly three million tons have already been moved with no fatalities. Similarly, we are aware of no fatalities occurring during the work that Santee Cooper has performed related to clean closure.

10. The DEIS fails to analyze key socioeconomic and environmental justice impacts, including consumption of contaminated well water and fish.

The cursory discussion of socioeconomic and environmental justice impacts in the DEIS focuses exclusively on impacts related to transportation of fill and coal ash.[265] To the extent that the DEIS relies on its deficient transportation analysis and its artificially restricted range of alternatives to evaluate transportation-based impacts on communities, the analysis of socioeconomic and environmental justice impacts is inadequate and misleading for the reasons set forth in Sections IV.E (Alternatives) and IV.F.7 (Transportation) above.

More fundamentally, however, TVA's analysis ignores key environmental justice impacts based on ongoing groundwater and surface water contamination, claiming that "adverse human health or environmental impacts as a result of ash impoundment closures are not anticipated."[266] As discussed in Sections IV.F.2 (Groundwater) and IV.F.3 (Surface Water), ongoing and persistent groundwater and surface water contamination should indeed be anticipated if TVA selects Alternative B (Close-in-Place). Yet the DEIS contains no discussion of impacts associated with the potential consumption of contaminated well water or other

[263] DEIS Part I at 127–28.

[264] Att. 55, Duke Energy, Coal Ash Excavation Plan, 2015 Update, at 11 (Nov. 13, 2015), http://www.duke-energy.com/pdfs/asheville-excavation-plan.pdf.

[265] DEIS Part I at 101.

[266] *Id.* at 100.

drinking water resources.[267] This is an inexplicable omission, since toxic chemicals were recently found in drinking water wells near TVA's own Gallatin Fossil Plant. [268]

Nor does the DEIS discuss the impacts associated with consumption of fish contaminated by heavy metals through contact with surface water that has been contaminated by groundwater mixing or unmitigated discharge of decanted and pore water.[269] In this regard, we note that the U.S. Commission on Civil Rights is currently investigating EPA's rules related to coal ash, including the Coal Ash Rule, for their impact on environmental justice communities.[270] The Commission will present its findings to Congress and the President later this year.

Consistent with its overall analysis, in this section TVA highlights the short-term impacts of truck traffic rather than the long-term impacts associated with persistent contamination of ground and surface waters. The analysis falls far short of the requirements of NEPA.

G. The analysis of cumulative impacts does not include the cumulative effects of leaving coal ash in continuous contact with groundwater for decades or dumping untreated water into rivers and streams.

NEPA requires an analysis of the cumulative impacts associated with a proposed action.[271] The cumulative impacts analysis in the DEIS is deeply flawed because it relies on the inaccurate description of baseline conditions, the artificially curtailed range of alternatives considered, and unsupported analyses discussed above. Based on these flawed analyses, TVA asserts that, with respect to Alternative B, groundwater and surface water impacts "would be improved on a cumulative basis…."[272]

This assertion is wrong for several reasons. First, the baseline should reflect TVA's commitment and obligation to close its surface impoundments, and the relevant comparison should be between capping its coal ash in unlined, leaking pits or removing it to safer lined, dry storage.[273] Second, even if TVA uses the baseline it proposes, the cumulative impacts analysis

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[267] *Id.* at 100–01.

[268] Att. 56, Jordan Buie and Josh Cross, *Chemicals found in wells near Gallatin power plant*, The Tennessean (Oct. 23, 2015), http://www.tennessean.com/story/news/environment/2015/10/23/chemicals-found-wells-near-gallatin-power-plant/74374292/.

[269] DEIS Part I at 100–01; Att. 57, Tenn. Wildlife Res. Agency, Fish Consumption Advisories (last updated Aug. 8, 2012), http://www.tnfish.org/ContaminantsInFishAdvisories_TWRA/FishFleshConsumptionAdvisories_TWRA.htm; Att. 58, S. Habib & A. Samah, *Effect of Heavy Metals Pollution on Protein Biosynthesis in Catfish*, 5 J. Water Resource & Protection 555 (2013), http://dx.doi.org/10.4236/jwarp.2013.55056.

[270] Att. 59, News Release, U.S. Comm'n on Civil Rights, U. S. Commission on Civil Rights Announces that its 2016 Enforcement Report Will Examine Possible Violations of Civil Rights Relating to Environmental Justice (July 20, 2015), www.usccr.gov/press/2015/PR_EnvironJustice.pdf.

[271] 40 C.F.R. § 1508.25.

[272] DEIS Part I at 132.

[273] *See* Section IV.D.

does not take into account ongoing contamination of groundwater due to improper closure and an ongoing connection between contaminated groundwater and surface water, described in Section IV.F.2 (Groundwater). Finally, the analysis does not factor in TVA's proposal to dump millions of gallons of untreated decanted and pore water into our rivers and streams.[274]

The analysis of cumulative impacts associated with Alternative C overstates the impacts associated with this alternative. This analysis relies heavily on the flawed transportation, air quality and greenhouse gas analyses, discussed in Sections IV.F.7-8.[275] In addition, TVA invokes the undisclosed EPRI reports to support its conclusion. Because the analyses upon which its cumulative analysis is based are flawed and inadequate, so too is the discussion of cumulative transportation, air quality and greenhouse has impacts associated with Alternative C.

DEIS PART II: SITE-SPECIFIC ANALYSES

I. Because each site-specific analysis in Part II tiers to the flawed programmatic analysis in Part I, each one fails to satisfy the disclosure and analysis requirements of NEPA.

Tiering is the procedure by which an agency refers to earlier, general analysis of impacts at a program level and focuses only on issues specific to an individual site in a subsequent environmental document. Under NEPA, tiering is appropriate "when the sequence of statements or analyses is: (a) From a program, plan, or policy environmental impact statement to a program, plan, or policy statement or analysis of lesser scope or to a site-specific statement or analysis."[276] However, if the programmatic analysis is inadequate, subsequent site-specific analyses that tier to that analysis are also inadequate.[277]

Each of the site-specific analyses presented in Part II of the DEIS tiers to the fundamentally inadequate programmatic analysis in Part I. Our comments on the programmatic analysis in Part I, therefore, are incorporated by reference into our comments on each of the site-specific analyses in Part II. However, nothing in the site-specific analyses in Part II corrects the following fundamental flaws in Part I:

- Reliance on undisclosed information in the EPRI Impact Framework and Impact Assessment to analyze and support conclusions regarding key impacts;

[274] *See* Section IV.F.3.

[275] DEIS Part I at 133.

[276] 40 C.F.R. § 1508.28.

[277] *Kern v. U.S. Bureau of Land Mgmt.*, 284 F.3d at 1074.

- Overly narrow definition of purpose and need, in reliance on a flawed interpretation of the federal Coal Ash Rule, and in disregard of applicable state and federal law;

- Failure to describe the "no action" alternative accurately, ignoring the TVA Board's pre-existing direction and the predictable consequences of continuing to violate state and federal water pollution and solid waste laws;

- Failure to characterize baseline conditions accurately, due to reliance on a "hypothetical" model in EPRI's Impact Assessment, rather than on the actual environment;

- Omission of a reasonable range of clean closure alternatives from consideration; and

- Failure to support conclusions regarding environmental impacts with sufficient evidence to demonstrate reasoned analysis.[278]

Because each site-specific analysis in Part II tiers to the inadequate analysis in Part I, each fails to satisfy the public disclosure and analysis requirements of NEPA.

The site-specific comments below provide additional analysis of key environmental impacts, including groundwater and surface water impacts, at each of the following sites:

- Allen Fossil Plant (West Ash Pond)
- Bull Run (Sluice Channel and Fly Ash Pond)
- Colbert (Ash Pond 4)
- John Sevier (Bottom Ash Pond)
- Kingston (Stilling Pond and Sluice Trench)
- Widows Creek (Ash Impoundment Complex).

We also highlight the effect of the artificial timing constraints on the alternatives analyzed for each site.

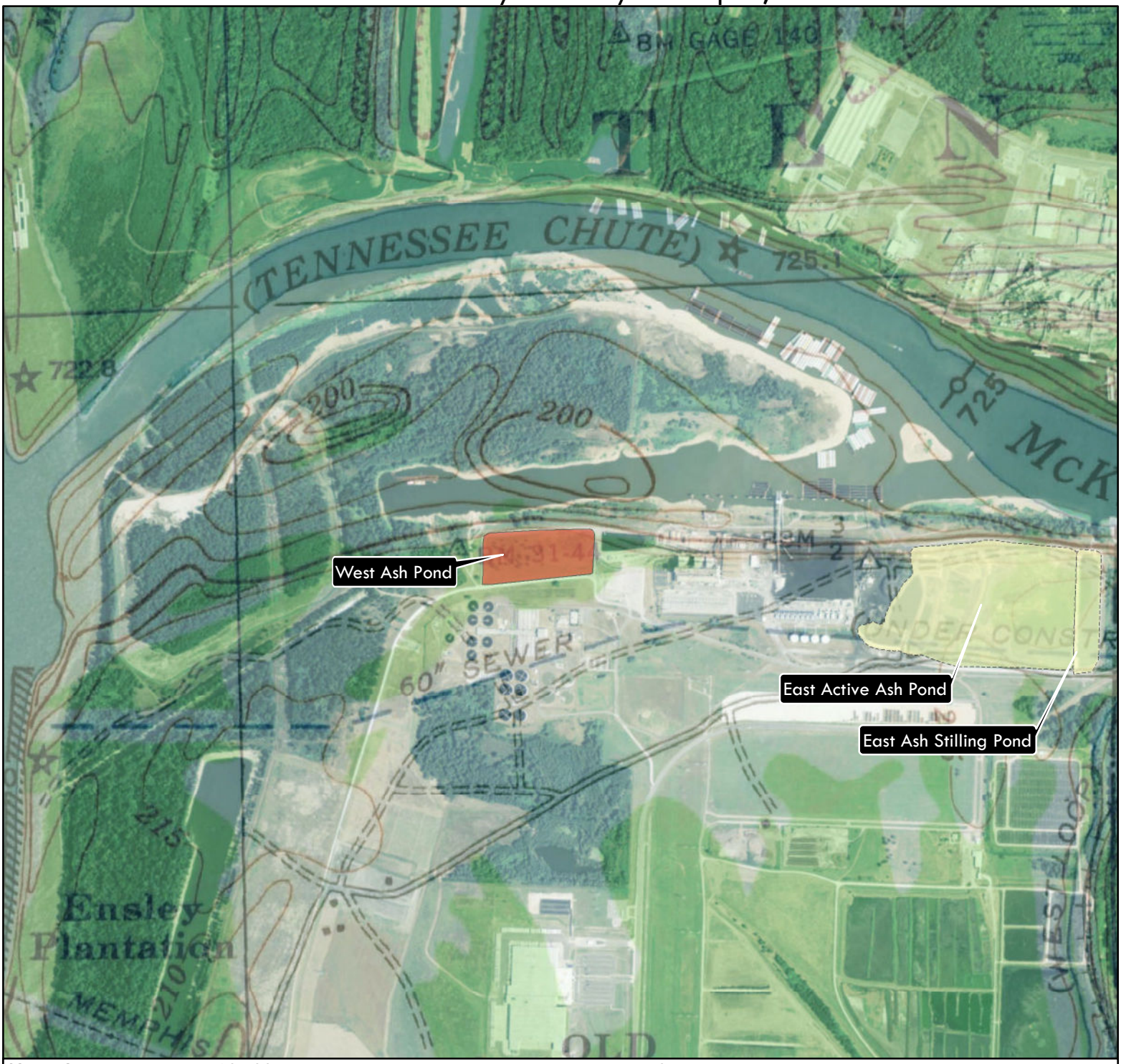
II. The site-specific analysis of the West Ash Pond at Allen Fossil Plant is inadequate.

The Allen Fossil Plant is located at the convergence of McKellar Lake and the Mississippi River. The map below illustrates the location of the West Ash Pond in relation to current and historic surface waters and other on-site ash storage and disposal areas.

[278] Part I, Sections I–IV above.

Allen Fossil Plant

Tennessee Valley Authority - Memphis, TN

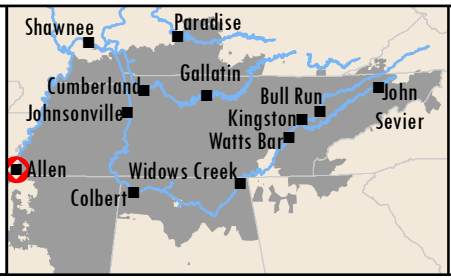


About the Map: Historic 1:62,500 scale USGS Topographic Maps (Memphis, TN (1955)) are shown to display the streams and rivers present before construction of Allen Fossil Plant and ash ponds. The topographic maps have a transparency to reveal an aerial photograph (USDA-NAIP, 2014) beneath for reference to recent site conditions.

1955: West Ash Pond likely began recieving ash

1969: East Ash Pond began receiving sluiced ash.

Map Location Within TVA Service Territory



Legend

0 0.25 0.5 1 Miles

Coal Ash Unit

Cap in place proposed (2015 DEIS)

No site-specific action proposed (2015 DEIS)

Southern Environmental Law Center

DISCLAIMER: Map intended for illustrative purposes only. Ash pond and landfill boundaries are best estimates based on documents from EPA and the utilities themselves. Locations of existing and retired ash ponds and landfills were created by heads-up digitizing of aerial imagery and USGS 7.5 min. topographic maps.

Map created by Jovian Sackett (jsackett@selcnc.org) | Last Updated: 3/9/2016

In its site-specific analysis for the West Ash Pond at Allen Fossil Plant, TVA alleges three reasons why it prefers closure in place (Alternative B): (1) Alternative B can be completed in a shorter time frame than closure by removal (Alternative C); (2) it is less costly; and (3) it results in fewer impacts to environmental justice communities.[279] To arrive at this conclusion, the DEIS makes several unsupported and incomplete assumptions that constrain options and overstate impacts associated with Alternative C. It also understates the groundwater, surface water, and related impacts associated with Alternative B.

A. The West Ash Pond does not have to close by April 2018.

In the DEIS, TVA indicates it intends to "facilitate continued closure" of the West Ash Pond by April 2018.[280] As a preliminary matter, we question TVA's assertion that the West Ash Pond is not subject to the Coal Ash Rule.[281] As the DEIS explains, an impoundment is only "closed" if it no longer contains water.[282] There is insufficient information in the DEIS to determine whether the West Ash Pond contained water on or after October 19, 2015, and therefore whether it is a "closed" or "inactive" surface impoundment." TVA does not identify the uppermost aquifer at the West Ash Pond; thus we do not know whether the ash is in continuous contact with groundwater. If the ash is in contact with groundwater, the impoundment still contains water. Further, as explained in Part I, Section IV.F.2 (Groundwater), simply decanting water from an ash pond does not remove all the water from the ash.[283] The DEIS states only that the water at West Ash Pond was "pumped out."[284] Without more information, it is not clear whether West Ash Pond is subject to the Coal Ash Rule.

In any event, if, as TVA suggests, the West Ash Pond is not subject to the Coal Ash Rule, the DEIS provides no justification for fast-tracking closure at this site. The ongoing monitoring and corrective action provisions of the Rule would not apply.

If the West Ash Pond *is* an inactive surface impoundment subject to the Coal Ash Rule (as we believe it may be), the early closure loophole does not "encourage" TVA to close its ash ponds by April 2018 without regard to risk to human health and the environment, as discussed in Part I, Section IV.C (Purpose and Need).

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[279] TVA, Draft Ash Impoundment Closure Programmatic EIS, Part II—Site-Specific NEPA Review: Allen Fossil Plant 13 (Dec. 2015) [hereinafter DEIS Part II (Allen)].

[280] *Id.* at 4.

[281] *Id.* at 1.

[282] *Id.*; *see also* Att. 2, Coal Ash Rule, 80 Fed. Reg. at 21,343 ("'Inactive' surface impoundments are those that contain both CCR and water, but no longer receive additional waste."); 40 C.F.R. § 257.53 ("Inactive surface impoundment means a CCR surface impoundment that no longer receives CCR after October 19, 2015 and still contains both CCR and liquids on or after October 19, 2015.").

[283] *See also* Att. 5, Quarles Report ¶¶ 21–24.

[284] DEIS Part II (Allen) at 1.

The DEIS inaccurately suggests that TVA is constrained by the early closure loophole. It is not. After filling the West Ash Pond with coal ash for decades, TVA artificially limits its alternatives analysis and assessment of how to safely close the pond by claiming it must hit a rapidly-approaching deadline. Giving itself a short timeline does not excuse TVA from providing the full, fair and public analysis required by NEPA.

B. TVA's self-imposed fast track to closure unreasonably constrains the alternatives analyzed for the West Ash Pond.

In its analysis of transportation options to remove coal ash waste from the West Ash impoundment, TVA bases all of its analysis on the mistaken contention that removal would have to take place within two years, in order to meet TVA's arbitrary April 2018 timeline.[285] By limiting the analysis to impacts of moving ash in this constrained time period, TVA overstates the severity of potential impacts from transporting ash from the Allen site via truck.

For example, TVA states that 25,000 truckloads would be needed to remove the waste, which would require an average of 100 truck trips per day and would equate to 200 trucks passing a given location during each 24-hour period.[286] These numbers are based on using a 10-yard tandem dump truck. TVA offers no explanation why removal activities could not be accomplished using 15-yard tandem dump trucks, as are being used in the transportation of borrow material.[287] Even using 10-yard tandem dump trucks, TVA finds that the impacts to local roadways under Alternative C are negligible and result in only a slightly larger increase in traffic compared to traffic impacts associated with Alternative B.[288] TVA nevertheless finds that traffic impacts associated with Alternative C, and related impacts, support its decision to cover the coal ash at West Pond in place.

This flawed conclusion is used by TVA in other parts of its analysis (e.g., environmental justice impacts) to overestimate the impacts on the surrounding community associated with removal of ash via truck. TVA is not required to close ash ponds by April 2018. Thus, it should have also included analysis that looked at the impacts associated with closing the Allen site over a longer time period, which would necessarily reduce the daily traffic count of trucks and greatly decrease any negative impacts to the community and infrastructure.

Moreover, the DEIS entirely fails to consider removal by barge at Allen, despite the fact that the plant receives its coal via barge. Although TVA makes assertions as to why barge transport is unsuitable generally,[289] at some sites, barge transport may be more attractive than

[285] *Id.* at 10.
[286] *Id.*
[287] *Id.* at 41.
[288] *Id.* at 40, 41.
[289] DEIS Part I at 23.

either rail or truck.[290] In order to conduct proper NEPA analysis, TVA must consider removal by barge, or it must provide an adequate explanation of why this mode of transportation would not be appropriate for Allen specifically.[291]

C. The DEIS fails to establish accurate, site-specific baseline conditions for the West Ash Pond, and therefore does not adequately analyze groundwater impacts.

The DEIS does not describe the groundwater elevations at Allen or make any attempt to estimate the amount of ash that may be saturated with groundwater. As environmental groups noted in their comments on scoping, available evidence suggests that large parts of both ash ponds are likely to be below the water table.[292] This means that capping the ponds without excavating ash will not eliminate important pathways for contamination of groundwater and surface water.

TVA's references to the EPRI Impact Assessment do not provide sufficient analysis. First, without access to the Impact Assessment itself we cannot evaluate its merit; and second, both TVA and EPRI have admitted that the Impact Assessment is based not on site-specific conditions, but on a "hypothetical" coal ash pond.

Groundwater quality is barely mentioned among the "key factors" evaluated for the West Pond (subsumed under "risk to adjacent environmental resources").[293] TVA states that "[n]o representative monitoring records specific to the West Ash Impoundment regarding ground water quality are available."[294] This is not accurate. TVA sampled well P2, down- or side-gradient of the West Ash Impoundment and just over 200 yards away, at least six times between 2004 and 2015, most recently in August 2014.[295]

Although we see the same troubling pattern here as we see across the TVA fleet—where TVA discontinues monitoring of potentially dangerous pollutants—the data from these sampling events are still meaningful. In particular, arsenic in well P2 has averaged 10 ug/L, which shows that the groundwater is unsafe to drink. This is much higher than the arsenic in the nearest up-gradient well, P1 (1.5 ug/L), suggesting that the West Ash Impoundment and/or the chemical pond located nearby is the source of the contamination.

TVA states that it "has conducted groundwater monitoring at the East Ash Impoundment and has analyzed samples for antimony, arsenic, barium, beryllium, cadmium, chromium,

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[290] *See* Part I, Section IV.E (Alternatives); *see also* Att. 32, Atherton Report at 3–5.

[291] *See* Part I, Section IV.F.7 (Transportation); *see also* Att. 32, Atherton Report at 3–5.

[292] Att. 25, Scoping Comments at 4, 6–7.

[293] DEIS Part II (Allen) at 6–7.

[294] *Id.* at 17.

[295] *See* Att. 49, EIP Report; Att. 50, EIP Update Report at 10.

fluoride, lead, mercury, nickel, nitrate+nitrite, selenium, silver, thallium, turbidity and total suspended solids."[296] This is accurate, but incomplete: TVA also measured (at least some of the time) aluminum, boron, chloride, cobalt, copper, manganese, molybdenum, strontium, sulfate, total dissolved solids, vanadium, and zinc.[297] In evaluating the available data, TVA concludes that high levels of arsenic are "anomalous." It also states that levels of other toxic chemicals "appear stable or non-detectable," implying that the groundwater is not contaminated.[298]

TVA's analysis is not supported by the available evidence. Arsenic in well P6, down-gradient of the East Ash Pond, is not by any definition "anomalous." Arsenic concentrations in that well fluctuate between 15 and 43 ug/L, consistently higher than the MCL for arsenic (10 ug/L). There is no "anomalous" reading within the dataset for well P6. And it is not the only well with high arsenic; down-gradient wells P2 and P3 have both exceeded the MCL. Well P6 is not an anomaly within the groundwater monitoring network at Allen.

And despite TVA's suggestion to the contrary, there is direct evidence in the Allen groundwater database that arsenic is *not* naturally occurring at the levels seen at Allen: the average concentration in up-gradient well P1 is 1.5 ug/L, while the average value in well P6 is 30.6 ug/L—20 times higher than background. As described below, well P6 also has elevated concentrations of coal ash indicator pollutants. This means that the groundwater in well P6 is contaminated by coal ash, and the high arsenic readings are almost certainly a part of that contamination.

Finally, to say that groundwater has not exceeded groundwater protection standards implies that there is no contamination.[299] This is not a legitimate implication. For one thing, Tennessee does not have groundwater protection standards for many coal ash indicator pollutants, including boron and sulfate. It is more informative to compare groundwater to background (naturally occurring) concentrations. These indicator pollutants exceed background levels, demonstrating that the ash ponds have contaminated the groundwater:

[296] DEIS Part II (Allen) at 17.
[297] Att. 49, EIP Report at 24–31.
[298] DEIS Part II (Allen) at 17.
[299] *Id*.

Table 1: Mean concentrations of key coal ash indicator pollutants in up-gradient (green) and down-gradient (red) monitoring wells at Allen Fossil Plant, 3/17/2004 through 8/12/2014.

	Mean boron concentration (mg/L)	Mean sulfate concentration (mg/L)
P1 (background)	*0.20*	*19.8*
P2	0.31	65.3
P3	0.20	50.7
P4	0.23	44.3
P5	0.25	36.8
P6	1.09	63.0

It is worth noting that well P6, which as discussed above has the highest on-site concentrations of arsenic, also has the highest on-site concentrations of boron. This strongly suggests that the arsenic in well P6 is coming from coal ash.

Because TVA has failed to give meaningful consideration to the impacts on groundwater of coal ash disposed of within the water table, and has failed to analyze groundwater quality, it does not have sufficient information to choose between Alternatives B and C. TVA must model groundwater contamination pathways at the Allen ash ponds, and must estimate the extent to which groundwater will exceed up-gradient concentrations and health-based benchmarks for all coal ash pollutants (including, at a minimum, those in Appendices III and IV of the EPA Coal Ash Rule[300] and manganese). TVA must also evaluate the potential impact to surface water and sediment from the migration of contaminated groundwater, before it has enough information to choose between Alternatives B and C.

D. The analysis of surface water, wetlands and floodplain impacts is also inadequate.

In the Draft EIS, TVA does not make the connection between surface water impacts of Alternative B at a normal river stage and surface water impacts in a flooding event. TVA acknowledges that the West Ash Pond is located within the 100-year floodplain of McKellar Lake.[301] During the flooding in 2011, both of the ash ponds at the Allen Fossil Plant were overtopped with floodwater, as shown in the photograph of the East Ash Pond below taken by the Tennessee Clean Water Network.[302]

[300] 40 C.F.R. pt. 257, apps. III, IV.

[301] DEIS Part II (Allen) at 22.

[302] Att. 25, Scoping Comments at 5 (flooding of West Ash Pond).

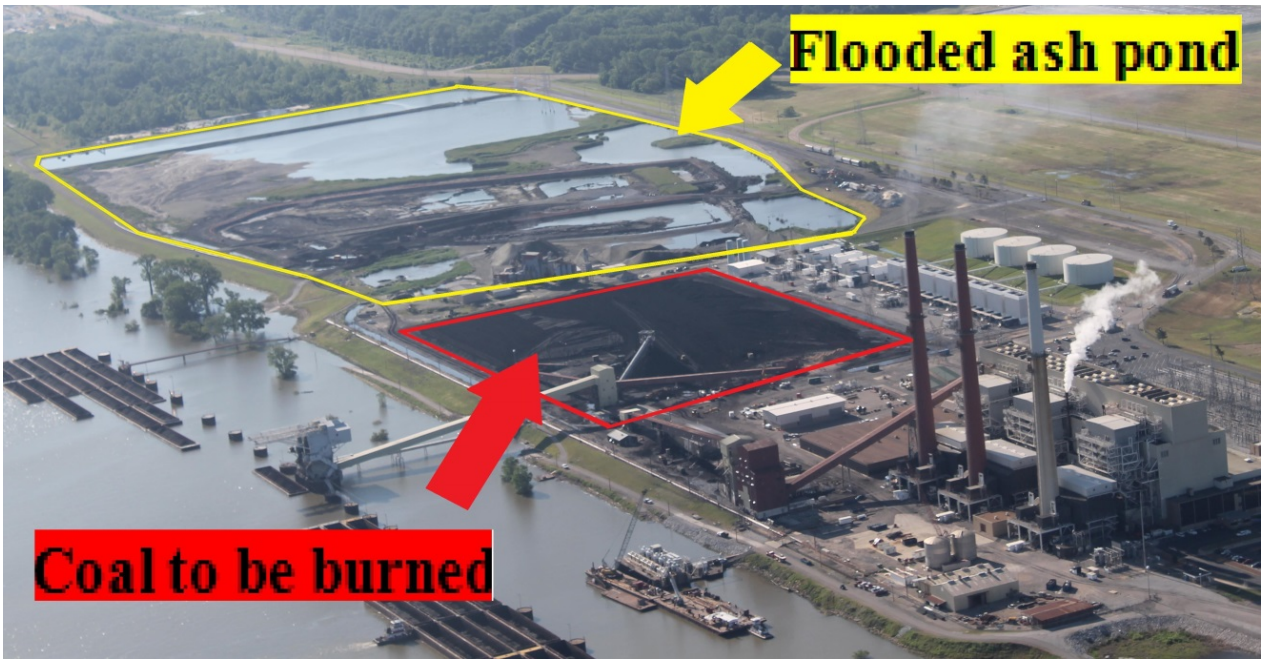

Figure 1: Allen Coal Ash Pond, May 17, 2011 (Tennessee Clean Water Network)

Given the likelihood of future flooding events in the area, TVA should have analyzed the impacts of Alternative B to surface water and aquatic life in McKellar Lake in the event of another flooding event.

In addition, the analysis of surface water, wetlands and floodplain impacts in the DEIS is inadequate for all of the reasons stated in Part I, Sections IV.F.3 (Surface Water), IV.F.5 (Floodplains) and Section IV.F.6 (Wetlands).

E. The DEIS entirely fails to analyze the potential for ongoing groundwater and surface water contamination to affect environmental justice communities near the Allen plant.

Allen Fossil Plant is located in a significant environmental justice community, with minorities comprising more than half of the surrounding population and several neighborhoods where the poverty rate exceeds the national average.[303] Although TVA identifies environmental justice as one of the three main reasons it recommends Alternative B (closure in place) for the West Ash Pond, the analysis does not support the claim that environmental justice communities in the area would benefit more from Alternative B than Alternative C. As explained in Part I, Section IV.C and E, TVA improperly constrains the time period for removal activities and inflates impacts associated with truck traffic. Even with this tipping of the scales, the Draft EIS does not support the claim that Alternative C would have a greater negative impact on neighboring communities.

[303] DEIS Part II (Allen) at 34–35.

For example, TVA states that "transport of CCR would only occur during selected times during the construction period, and hauling trips would be dispersed throughout the day and would fit in with familiar traffic patterns along these roadways."[304] It concludes that "[i]ndirect impacts…are short term and, given the number of truck trips to haul CCR off-site (24 trucks passing by a given location each hour) are minor to moderate in nature."[305] In addition, TVA points out that it will provide employment opportunities to the local community to support the removal work, which "would result in positive impacts to area low-income and minority populations."[306] Based TVA's own analysis, Alternative C appears to have significant economic benefits for environmental justice communities that are not apparent for Alternative B.

More importantly, TVA entirely fails to analyze key environmental impacts that would directly affect environmental justice communities if TVA moves forward with Alternative B. McKellar Lake is frequently used by community members for subsistence and recreational fishing, with catfish comprising a large part of the fish caught in the lake. Additionally, McKellar Lake is home to a marina that has a few houseboats docked next to it. Currently, the Tennessee Wildlife Resources Agency has a fish advisory for McKellar Lake, warning that no fish should be taken and eaten from the lake due to contamination by mercury, chlordane and other organics.[307] Despite these warnings, community members continue to fish in the lake. Due to the fact that catfish are bottom-feeders, these fish are more likely to come into contact with heavy metals that have leached into sediment. The heavy metals bio-accumulate in catfish and can cause negative health effects in humans when eaten.[308]

TVA fails to analyze how impacts to groundwater and surface water from Alternative B (capping in place) may affect drinking water resources, including well water and surface water, as well as the health of the fish population within McKellar Lake. Given that negative health impacts due to consumption of contaminated water and fish are far greater and more immediate than the environmental justice impacts associated with increased truck traffic, TVA fails to analyze the full range of impacts to environmental justice communities.

III. The site-specific analysis of the Sluice Channel and Fly Ash Pond at Bull Run Fossil Plant is inadequate.

The Bull Run Fossil Plant is located at the convergence of the Clinch River and Bull Run Creek. The map below illustrates the location of the Sluice Channel and Fly Ash Pond in relation to current and historic surface waters and other on-site ash storage and disposal areas.

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[304] *Id.* at 36.

[305] *Id.*

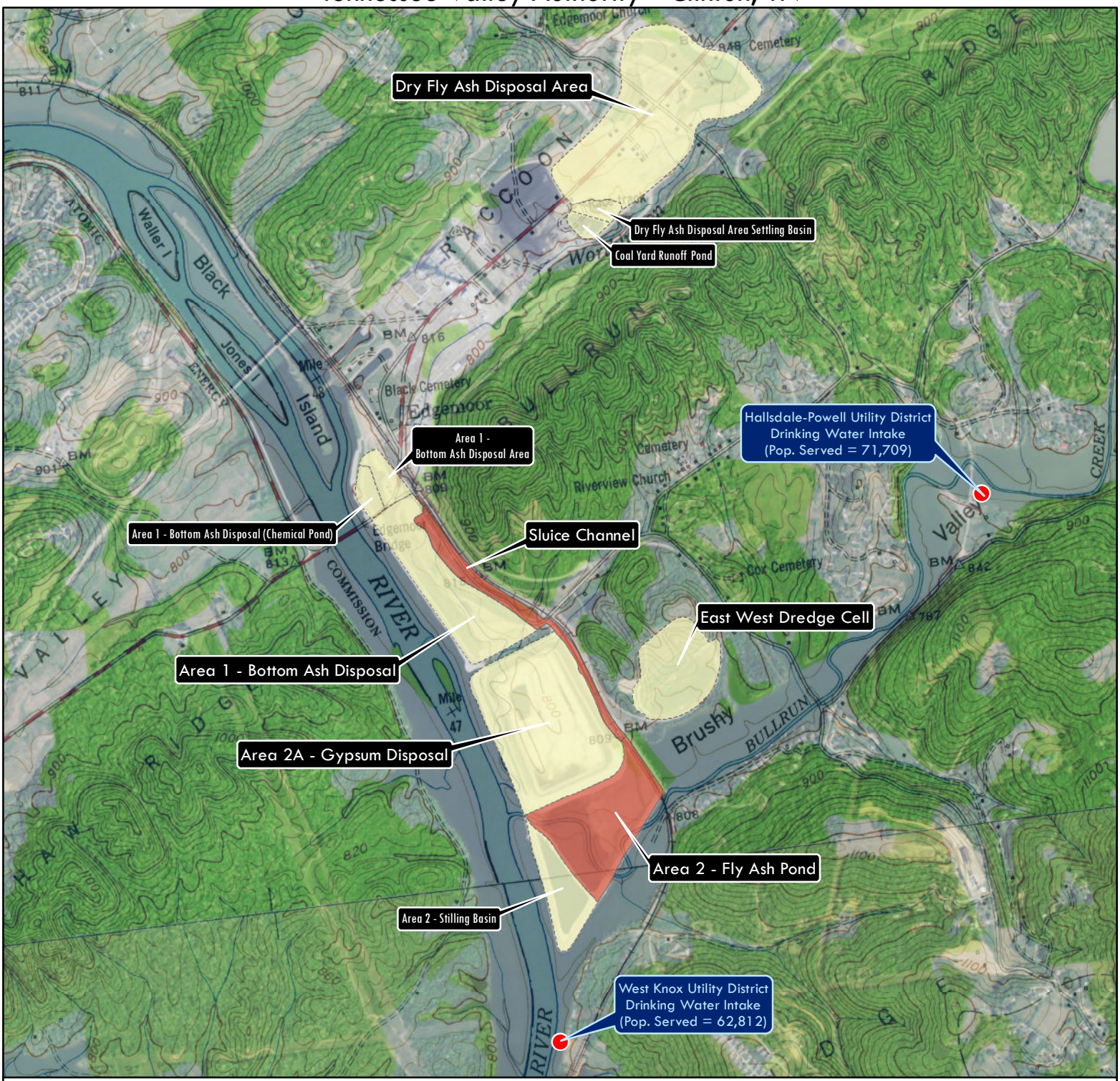
[306] *Id.*

[307] Att. 57, Tenn. Wildlife Res. Agency, Fish Consumption Advisories (last updated Aug. 8, 2012), http://www.tnfish.org/ContaminantsInFishAdvisories_TWRA/FishFleshConsumptionAdvisories_TWRA.htm.

[308] Att. 58, S. Habib & A. Samah, *Effect of Heavy Metals Pollution on Protein Biosynthesis in Catfish*, 5 J. Water Resource & Protection 555 (2013), http://dx.doi.org/10.4236/jwarp.2013.55056.

Bull Run Power Station

Tennessee Valley Authority - Clinton, TN

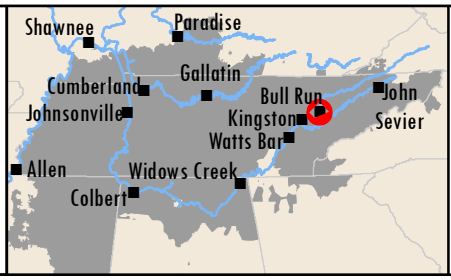


About the Map: Historic 7.5 Minute USGS Topographic Maps (Clinton, TN (1952); Lovell, TN (1953)) are shown to display the streams and rivers present before construction of Bull Run Power Station, ash ponds, and the Melton Hill Reservoir. The topographic maps have a transparency to reveal an aerial photograph (USDA-NAIP, 2014) beneath for reference to recent site conditions.

1963: Construction of Melton Hill dam completed, creating Melton Hill Reservoir.

1966: Bottom Ash Disposal Area 1 and the Fly Ash Pond (Area 2) begin service.

Map Location Within TVA Service Territory



Legend

0 0.25 0.5 1 Miles

Coal Ash Unit

Cap in place proposed (2015 DEIS)

No site-specific action proposed (2015 DEIS)

Southern Environmental Law Center

DISCLAIMER: Map intended for illustrative purposes only. Ash pond and landfill boundaries are best estimates based on documents from EPA and the utilities themselves. Locations of existing and retired ash ponds and landfills were created by heads-up digitizing of aerial imagery and USGS 7.5 min. topographic maps.

Map created by Jovian Sackett (jsackett@selcnc.org) | Last Updated: 3/9/2016

A. The Sluice Channel and Fly Ash Pond do not have to close by April 2018.

As discussed in Part I, Section IV.C (Purpose and Need), the early closure loophole does not "encourage" TVA to close its ash ponds by April 2018 without regard to risk to human health and the environment. By presuming that all alternatives must be completed by April 2018, TVA impermissibly restricts the range of alternatives considered in detail at the site-specific level.

The DEIS inaccurately suggests that TVA is constrained by the early closure loophole. It is not. After filling the Sluice Channel and Fly Ash Pond with coal ash for decades, TVA artificially limits its alternatives analysis and assessment of how to safely close these ponds by claiming it must hit a rapidly-approaching deadline. Giving itself a short timeline does not excuse TVA from providing the full, fair and public analysis required by NEPA.

B. TVA's self-imposed fast track to closure unreasonably constrains the alternatives analyzed for the Sluice Channel and Fly Ash Pond.

TVA entirely rules out closure by removal, and without a permissible basis, because it restricts itself to the early closure loophole under the Coal Ash Rule (which, as we explain in Section IV.C, is not the only option in the rule). For example, TVA states that "[f[or sites like BRF with CCR volumes exceeding 500,000 yd^3, TVA determined that insufficient time is available within the construction schedule to effectively remove the CCR materials by trucking and achieve closure of inactive impoundments by April 17, 2018."[309]

This does not mean that closure by removal is not possible, and it does not mean that closure by removal is not practical; it only means that it would be hard for TVA to take advantage of the early closure loophole if it closes the large ponds by removing the ash.

TVA makes a similar argument in rejecting rail transport as infeasible:

> [R]ail transport was determined to be a mode of transport that is not feasible or cost-effective for impoundments having a lower volume of CCR or those having a relatively short duration closure schedule. *Given the relatively short closure schedule for this impoundment*, the costs and environmental impacts associated with development and permitting of the required loading and unloading infrastructure, use of rail to transport CCR from this site would not be feasible.[310]

Again, the DEIS rules out an alternative by limiting itself to the early closure loophole. It is hard to see this as anything other than a post hoc rationale for a predetermined course of action in violation of NEPA. The frequently cited legal standard articulated by the D.C. Circuit in 1991 is clear:

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[309] DEIS Part II (Bull Run) at 7.

[310] *Id.* at 9 (emphasis added).

> [A]n agency may not define the objectives of its action in terms so unreasonably narrow that only one alternative from among the environmentally benign ones in the agency's power would accomplish the goals of the agency's action, and the EIS would become a foreordained formality.[311]

In contrast to its site-specific analysis for the West Pond at Allen, TVA does not identify the nearest Subtitle D landfill that would be the likely choice for permanent off-site storage of Bull Run coal ash under the Closure-by-Removal alternative. Without knowing where the coal ash waste would likely be stored off-site, it is impossible to evaluate potential impacts under Alternative C. Although it is likely this information was not included in the Draft EIS because TVA improperly screened out Alternative C for the Bull Run site-specific analysis, many of the reasons TVA cites for screening out Alternative C rest on impacts associated with the haul route for removal activities.

For example, one reason for not including Alternative C in its analysis is "[p]otential impacts to environmental justice populations located along the haul route to the nearest permitted Subtitle D Landfill."[312] In addition, TVA cites "[s]ignificant transportation related impacts related to degradation of local roadways, traffic congestion and safety issues."[313] Without knowing what path a haul route would take, the actual impacts from removing ash via truck remain unknown.

Although TVA identified rail transport as more appropriate for moving large quantities of coal ash, such as the 3,500,000 yd^3 located at Bull Run, the DEIS asserts that rail transport is not appropriate in this instance due to "the relatively short closure schedule for this impoundment."[314] As explained in Part I, Section IV.C, this closure schedule is an unreasonable and unnecessary constraint on the alternatives that should be considered in the DEIS. There is no legitimate basis provided in the DEIS for rejection of removal by rail or other transportation alternatives.[315]

C. The DEIS fails to establish accurate site-specific baseline conditions for the Sluice Channel and Fly Ash Pond, and therefore does not adequately analyze groundwater impacts.

The analysis of groundwater impacts in the DEIS contains no discussion of the location of the uppermost aquifer and whether the coal ash in the Sluice Channel and Fly Ash Pond sits

[311] *Citizens Against Burlington, Inc.*, 938 F.2d at 196.

[312] DEIS Part II (Bull Run) at 9.

[313] *Id.*

[314] *Id.* at 9.

[315] *See* Part I, Section IV.E (Alternatives); Att. 32, Atherton Report at 3–5.

within the water table. Without this critical information, it is impossible to evaluate the appropriate closure method at Bull Run.[316]

The DEIS mentions in passing that the "main plant" area at Bull Run is located atop bedrock characterized by karst, but fails to analyze the potential for sinkhole development and fractures to affect groundwater.[317] This is also critical information and analysis required to be included in the site-specific analysis of closure options at Bull Run.[318]

The groundwater at Bull Run is clearly contaminated by coal ash. TVA's discussion of groundwater quality barely mentions this fact, however. TVA does acknowledge an arsenic issue around its ash ponds:

> Groundwater concentrations from the samples taken from the monitoring wells in the vicinity of the Fly Ash Impoundment exceeded the Ground Water Protection Standard (GWPS) for arsenic (BRF-10-52) and barium (BRF-1). Arsenic at BRF-10-52 has exceeded the GWPS of 10 ug/L (micrograms per liter) since sampling began at this well in 2010. Concentrations have ranged from approximately 22 to 32 ug/L and appear stable. Barium at BRF-1 exceeded the GWPS of 2,000 ug/L during the last sampling event in August 2014.[319]

This description is accurate, and the high arsenic readings, which are significantly higher than the arsenic values in up-gradient well BRF-1 (mean value of 3.9 ug/L), suggest that the ash pond has contaminated local groundwater.

Unfortunately, TVA generally omits, minimizes, or distorts additional evidence of groundwater contamination:

> Analyses have also been performed on monitoring wells associated with the bottom ash/gypsum disposal area (wells BRF-1, BRF-47, BRF-48, BRF-49 and BRF-50) using laboratory analytical results from 2006 through February 2015. Time series have been developed for antimony, arsenic, barium, beryllium, cadmium, chromium, cobalt, copper, lead, mercury, nickel, selenium, silver, thallium, tin, vanadium, zinc, turbidity and total suspended solids. The metals series' are developed using the total metals analysis results. These time series are included in regulatory reporting to the agency. Groundwater concentrations from the monitoring wells associated with the bottom ash and gypsum disposal areas have generally not exceeded the GWPS for any parameter analyzed. Overall the trends appear stable or non-detectable, with the exception of arsenic (BRF-F45R, BRF-47). Arsenic appears to fluctuate but has mostly remained below the GWPS. In a recent sample, from BRF-47, arsenic was 11.1 ug/L (1.1 ug/L above the

[316] Att. 16, RT Report at 10; *see also* Part I, Section IV.F.2 (Groundwater).

[317] DEIS Part II (Bull Run) at 16, 18–19.

[318] *See* Part I, Section IV.F.2 (Groundwater); Att. 5, Quarles Report ¶¶ 17–18.

[319] DEIS Part II (Bull Run) at 17–18.

> GWPS of 10.0 ug/L). However, the filtered sample was below the GWPS at 5.0 ug/L.[320]

This section of text is inaccurate. To say that groundwater has not exceeded groundwater protection standards implies that there is no contamination. This is not a legitimate implication. Tennessee does not have groundwater protection standards for many coal ash indicator pollutants, including boron and sulfate. However, these indicator pollutants do exceed background levels, demonstrating that the ash ponds have contaminated the groundwater. Table 2 summarizes results for the wells near TVA's bottom ash/gypsum disposal area, and shows elevated and unsafe concentrations of several pollutants.

Table 2: Mean concentrations of key coal ash indicator pollutants in up-gradient (green) and down-gradient (red) monitoring wells at Bull Run Fossil Plant's bottom ash/gypsum disposal area, 5/4/2011 through 8/21/2015. Shaded cells exceed U.S. EPA guidelines for safe drinking water (see EIP Report for more detail).

	Mean boron concentration (mg/L)	Mean sulfate concentration (mg/L)	Mean cobalt concentration (µg/L)	Mean molybdenum concentration (mg/L)
BRF-1 (background)	*0.16*	*7.1*	*4.97*	*0.011*
47	2.07	824.3	9.41	0.041
48	1.75	1,576.9	45.23	0.010
49	2.17	450.6	5.65	0.560
50	0.19	30.1	3.90	0.004

Moreover, although TVA touts its on-site unlined landfill as a model of cap-in-place management, the claim that groundwater monitoring data near the Bull Run landfill "show no evidence of contamination"[321] is contradicted by TVA's own monitoring reports. Groundwater near the dry fly ash landfill has been severely contaminated by coal ash pollutants, particularly in wells 45 and 45-R, as the following summary shows:

[320] *Id.* at 18.

[321] *Id.*

Table 3: Mean concentrations of key coal ash indicator pollutants in up-gradient (green) and down-gradient (red) monitoring wells at Bull Run Fossil Plant's dry fly ash disposal area, 5/20/2008 through 8/14/2015. Shaded cells exceed U.S. EPA guidelines for safe drinking water (see EIP Report for more detail).

	Mean arsenic concentration (mg/L)	Mean boron concentration (mg/L)	Mean sulfate concentration (mg/L)	Mean manganese concentration (µg/L)	Mean molybdenum concentration (mg/L)
I (background)	*1.2*	*0.2*	*4.8*	*0.013*	*0.014*
45	4.1	3.6	745.0	9.700	0.007
45-R	6.1	16.3	1,833.9	6.263	0.098
G	1.3	1.1	190.6	0.058	0.033
J	1.4	1.1	371.9	0.070	0.014

Boron in well 45-R exceeds the EPA Child Health Advisory (3 mg/L) by more than 80 times. Manganese in well 45-R exceeds the EPA Lifetime Health Advisory (0.3 mg/L) by more than 30 times. Due to coal ash contamination, the groundwater near the fly ash landfill is extremely unsafe to drink. This is not a persuasive example of an unlined landfill providing responsible coal ash disposal practices.

D. The analysis of surface water , wetlands and floodplain impacts is also inadequate.

The Fly Ash Pond, and possibly the Sluice Channel, significantly encroach on waters of the United States, but there is no discussion in the DEIS of the need to obtain a permit for disposal of coal ash in these waters. Nor does the DEIS discuss the need to obtain landfill approval required by the State of Tennessee.[322]

Given the location of the Fly Ash Pond and Sluice Channel, the risk of scour and waste washout from flooding is extremely significant. Yet there is no analysis of these floodplain impacts in the DEIS.[323] TVA also fails to include any analysis of the potential to restore the floodplain and wetlands after removal of the ash, which would provide significant environmental benefits after the removal.[324]

In addition, for all of the reasons stated in Part I, Sections IV.F.3 (Surface Water), Section IV.F.6 (Wetlands) and IV.F.5 (Floodplains), the analysis of these impacts for the Sluice Channel and Fly Ash Pond is inadequate.

[322] Att. 16, RT Report at 2, 5.

[323] *Id*.

[324] *Id*. at 6.

IV. The site-specific analysis of Ash Pond 4 at Colbert Fossil Plant is inadequate.

The Colbert Fossil Plant ("Colbert") began producing electricity from the combustion of coal, gas and oil in 1955. At its peak, the facility had five coal-fired generating units with a total capacity of 1,300 megawatts (MW), which consumed approximately 8,900 tons of coal per day. TVA idled Unit 5, its largest unit, in 2013 and announced the retirement of the remaining four units for April 2016.

Ash Impoundment No. 4 (Ash Pond 4) is bordered by Cane Creek to the east and north, U.S. Highway 72 to the south, and a former metal-cleaning pond just to the west. Ash Pond 5 and a dry ash landfill are across Cane Creek to the east, both very close to Ash Pond 4. The Colbert powerhouse is several thousand feet to the north. Cane Creek meanders through the middle of TVA property and runs right beside the longest dike of Ash Pond 4 (the east dike), eventually coming to a confluence with the Tennessee River (impounded as Pickwick Lake) on the northwest side of the property. Ash Pond 4 is less than 4,000 feet from the Tennessee River at its shortest distance. The map below illustrates the location of Ash Pond 4 in relation to current and historic surface waters and other on-site ash storage and disposal areas.

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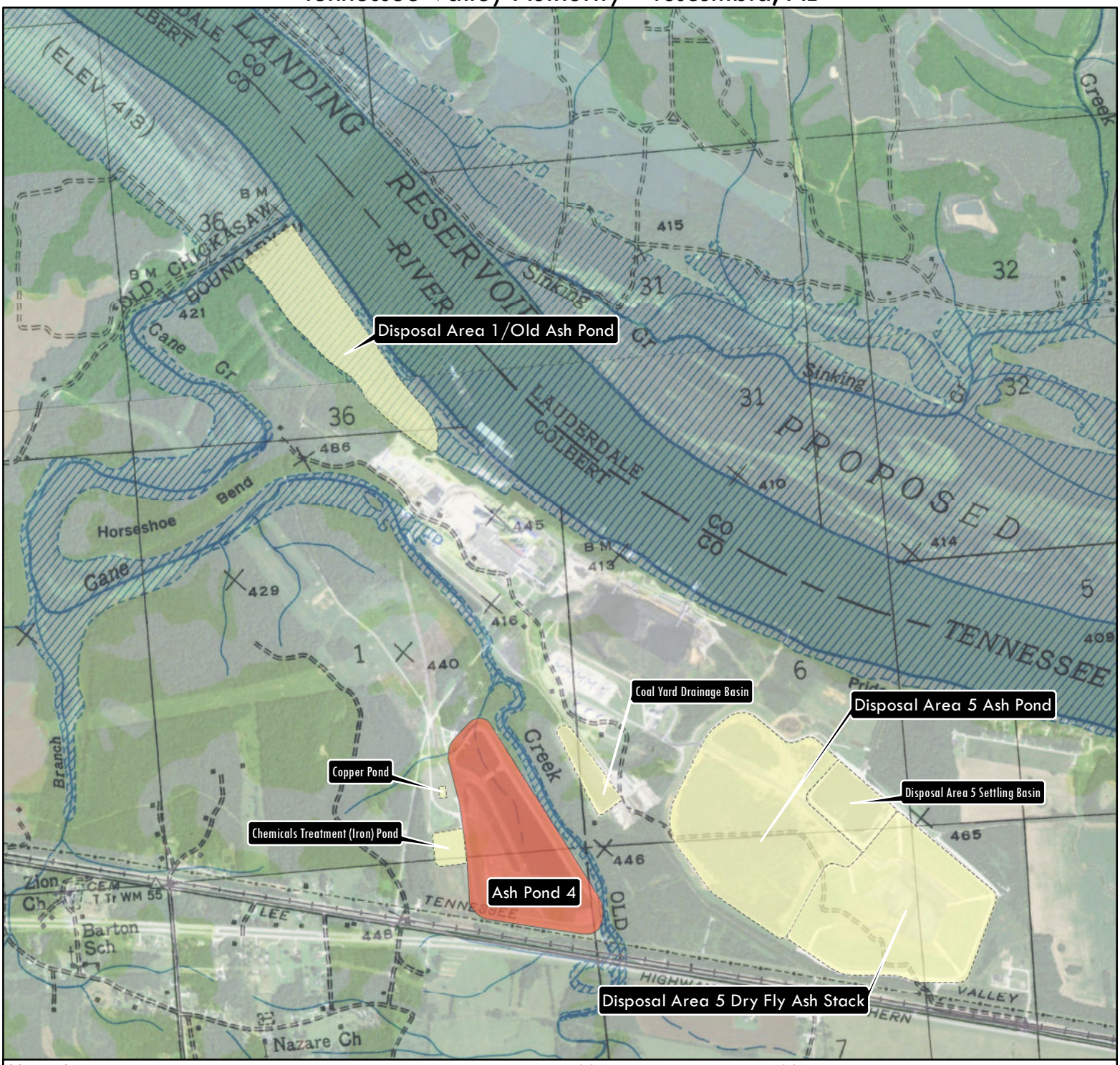
Colbert Power Station

Tennessee Valley Authority - Tuscumbia, AL



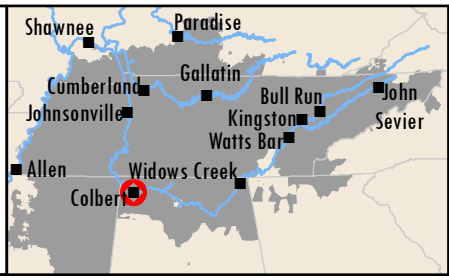
About the Map: Historic 7.5 Minute USGS Topographic Maps (Pride, AL (1936); Sinking Creek, AL (1936)) are shown to display the streams and rivers present before construction of Colbert Power Station, ash ponds, and the Pickwick Reservoir. The topographic maps have a transparency to reveal an aerial photograph (USDA-NAIP, 2014) beneath for reference to recent site conditions.

1938: Construction of Pickwick Dam completed, creating Pickwick Reservoir.

1952: Ash Pond 1 begins service.

1972: Ash Pond 4 begins service.

Map Location Within TVA Service Territory



Legend

0 0.25 0.5 1 Miles

Coal Ash Unit

Cap in place proposed (2015 DEIS)

No site-specific action proposed (2015 DEIS)

Southern Environmental Law Center

DISCLAIMER: Map intended for illustrative purposes only. Ash pond and landfill boundaries are best estimates based on documents from EPA and the utilities themselves. Locations of existing and retired ash ponds and landfills were created by heads-up digitizing of aerial imagery and USGS 7.5 min. topographic maps.

Map created by Jovian Sackett (jsackett@selcnc.org) | Last Updated: 3/9/2016

Ash Pond 4 has historically received approximately 30,000 tons of coal ash waste per year when all five units were in operation. It was first constructed in 1972 and contains approximately 1,200,000 tons of coal ash.

Colbert includes several on-site waste impoundments besides Ash Pond 4: Ash Pond No. 5, Ash Pond No. 1 (closed), a coal yard drainage basin, a chemical treatment pond, and a metal cleaning pond. TVA has purported to close some of these facilities by capping in place or by dredging and depositing their contents into other on-site impoundments. Most, if not all, of these facilities are unlined pits. As a result, there is no barrier to prevent contaminants from leaking into groundwater and to surface waters from these various sources.

As will be addressed below, the Colbert facility has a long history of groundwater contamination, as well as seepage from ash ponds to surface waters. Colbert has been the subject of numerous legal actions to remedy those problems. Despite repeated attempts to address contamination, problems persist to this day. The history of this contamination should have been considered in the DEIS as TVA plans to close and cap in place Ash Pond No. 4. The persistent pollution, cumulative effects of this decades-long contamination from ash ponds and other sources, on-going violations of the Alabama Water Pollution Control Act (AWPCA) and Clean Water Act, and TVA's inability to stop this pollution should have been considered in the DEIS for Colbert.

A. Ash Pond 4 does not have to close by April 2018.

Again TVA creates an artificial and self-imposed deadline for closure of Ash Pond 4 before April 2018.[325] Ash Pond 4 is an active pond and therefore does not qualify for the early closure loophole. Perhaps in recognition of this fact, TVA did not file a notice of intent to close the impoundment in its operating record before December 17, 2015, as required under the Coal Ash Rule.[326] Therefore, TVA cannot close the impoundment under 40 C.F.R. § 257.100, and the April 2018 date is simply irrelevant. After filling Ash Pond 4 with coal ash for decades, TVA artificially limits its alternatives analysis and assessment of how to safely close the pond by claiming it must hit a rapidly-approaching deadline. Giving itself a short timeline does not excuse TVA from providing the full, fair and public analysis required by NEPA.

B. TVA's self-imposed fast track to closure unreasonably constrains the alternatives analyzed for Ash Pond 4.

As discussed in Section IV.C (Purpose and Need), TVA's artificial self-imposed deadline constrains the analysis of alternatives at both the programmatic and site-specific level. In the DEIS for Ash Pond 4, TVA rejects Alternative C (clean closure) as "unreasonable" based on this

[325] DEIS Part II (Colbert) at 8.

[326] 40 C.F.R. § 257.100(c)(1).

artificial time constraint.[327] Other reasons it points to for rejecting Alternative C as unreasonable tier to the flawed analysis in Part I of the DEIS. In the absence of TVA's self-imposed deadline, there is no legitimate basis identified in the DEIS for rejecting Alternative C as unreasonable.

C. The DEIS fails to establish accurate site-specific baseline conditions for Ash Pond 4 and therefore does not adequately analyze groundwater impacts.

For over 30 years, pollutants have emanated from the Colbert coal ash ponds and other facilities to ground and surface waters. The decision to cap and close Ash Pond 4 in place must be viewed in light of the history of this site and this legacy of contamination.

In 1984, TVA constructed Ash Pond 5 next to Ash Pond 4, with Cane Creek in-between the two and less than a couple of thousand feet separating these large, unlined ash ponds. Both ash ponds sit above karst topography, terrain typically associated with sinkholes, underground caverns, caves, and harboring significant sources of groundwater with hydrologic connections to other sources of surface water.[328] In 1984, Ash Pond 4's dikes were raised 20 feet and constructed over sluiced ash.[329] TVA initially used Ash Pond 5 as a wet ash impoundment.

In 1985, the Alabama Department of Environmental Management (ADEM) found that two sinkholes had developed in the Colbert ash ponds that resulted in the unauthorized dumping of ash slurry into groundwater.[330] These sinkholes had developed a year earlier in 1984 and within three months of each other, causing water levels in ash Pond 5 to drop by roughly one foot per hour. As a result, ADEM required TVA to institute a program of groundwater monitoring, and TVA capped the sinkhole area but did not otherwise cease use of Ash Pond 5 for coal ash disposal. At some point, TVA converted the Ash Pond 5 area to dry stacking, and until 1990, it used portions of Ash Pond 5 to dispose of ash material dredged from Ash Pond 4. TVA had been using the Ash Pond 5 to dispose of approximately 350,000 tons per year of dry fly ash. Groundwater monitoring at Colbert began due to the initial groundwater contamination in the 1980s, and it has continued until now due to ongoing contamination.

In 1993, eight years after the sinkholes formed, TVA's monitoring data showed that they were still violating Alabama law with unauthorized discharges of pollutants into groundwater. ADEM again issued TVA a Notice of Violation, which stated that "substances related to the operations at the Colbert County facility have entered the groundwater," but without identifying

[327] DEIS Part II (Colbert) at 6, 8–9.

[328] Att. 6, TVA, Colbert Fossil Plant, Groundwater Incident 93-6-4, Groundwater Monitoring Report – April 2015 §§ 2.3, 2.4 (July 27, 2015).

[329] Att. 60, Stantec Consulting Servs., Inc., TVA Disposal Facility Assessment, Phase 1 Coal Combustion Product Facility Disposal Facility Summary, Colbert Fossil Plant (COF), Ash Pond (AP-4) (Field Assessment Dates: Jan. 14, 2009 and Feb. 3, 2009).

[330] Att. 61, TVA, Colbert Steam Plant Ash Pond Number 5 Engineering Report, 4 (Apr. 1985); Att. 49, EIP Report at 48.

the source.[331] In 1994, TVA evaluated the results of groundwater sampling from 39 wells installed in both soil and bedrock across the site in the 1980s. The data confirmed that groundwater had been contaminated near the metal cleaning pond, the coal yard, the coal yard drainage basin, and the ash ponds by such ash-related pollutants as boron, molybdenum, sulfate and various heavy metals. TVA also undertook to determine the content of the ash ponds by sinking wells into the wet ash, and found that water within the ponds contained elevated concentrations of aluminum, arsenic, cadmium, iron, lead, manganese, selenium, sulfate, barium and chromium.

In 2009, just after the Kingston disaster, another spill from TVA's facilities took place at Widows Creek. As a result of the Widows Creek spill and numerous other violations, ADEM and TVA signed a Consent Order, which included various requirements of TVA at Colbert.[332] The 2009 settlement required TVA to produce structural integrity reports and O&M assessments at Colbert, and a 2010 engineering report found that "seepage [at Colbert] has been occurring at various intervals along the mid-slope of the east and southeast dikes [of Ash Pond 4] since 1984, when the pond was expanded by raising the dikes."[333]

Groundwater monitoring reports since the 2009 settlement have continued to show instances of contamination associated with the Ash Ponds 4 and 5. For example, in 2012, TVA found that "elevated chromium at [well] CA30B and sulfate at [well] CA17B might be indicative of coal ash contamination from Ash Pond 4."[334] TVA had yet to "fully delineate[]" the extent of southwestward groundwater flow caused by mounding from these disposal areas.[335] And, in the April 2012 report, TVA found iron and manganese in wells down-gradient of Ash Pond 4 at levels that "likely indicate coal ash contamination at these wells."[336] Despite knowing and continued violations of the AWPCA, TVA continued to dispose of coal ash in Ash Pond 4 without taking steps to prevent the ongoing groundwater, and potentially surface water, contamination resulting from such disposal.

In 2013, several environmental groups, with SELC as counsel, filed a Notice of Intent to Sue under the Clean Water Act and the AWPCA for surface and groundwater violations, which

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[331] *See* Att. 62, Notice of Violation, sent by Ala. Dep't of Envtl. Mgmt. to TVA (Aug. 17, 1993).

[332] *See* Att. 63, Consent Order, *In re: TVA Widows Creek Fossil Plant, NPDES Permit No. AL0003875*, No. 10-002-CWP (Ala. Dep't of Envtl. Mgmt. Oct. 13, 2009).

[333] Att. 64, Stantec Consulting Servs., Inc., Report of Geotechnical Exploration and Slope Stability Evaluation – Ash Pond 4, Colbert Fossil Plant, § 3.3.2 (Jan. 22, 2010).

[334] Att. 65, TVA, Colbert Fossil Plant, Groundwater Incident 93-6-4, Groundwater Monitoring Report – October 2011, at 8 (Jan. 13, 2012).

[335] *Id.* at 6.

[336] Att. 66, TVA, Colbert Fossil Plant, Groundwater Incident 93-6-4, Groundwater Monitoring Report –April 2012, at 8 (July 6, 2012).

included seeps from Ash Pond 4 and continual groundwater contamination.[337] ADEM, shortly thereafter, filed a complaint outlining significant and continuous groundwater and surface water violations.[338]

> Groundwater monitoring reports submitted by Defendant [TVA] to the Department [ADEM] indicate that the Defendant [TVA] has caused or allowed the discharge of pollutants associated with ash pond wastewater and/or other storage pond wastewater, including but not limited to antimony, arsenic, boron, ammonia, iron, manganese, and vanadium from one or more sources unauthorized sources at Colbert to groundwater, a water of the State. [339]

ADEM's complaint also alleged that mercury results from surface water samples exceeded the state numeric water quality criterion for mercury.[340]

In May of 2013, a Consent Order was signed between TVA and ADEM requiring the continuation of groundwater monitoring, a corrective action plan to shutter a private well offsite, that TVA apply for a new lined industrial solid waste permit for Ash Pond 5 for dry ash, and a plan to monitor contamination emanating from Ash Pond 4, among other corrective actions.[341] The Consent Order also contains the following provision:

> If the data from the well directly down gradient of Ash Pond No. 4 does not reflect such an overall downward trend after five years, TVA shall prepare and submit to ADEM a plan for the closure of Ash Pond No. 4 in accordance with then-current closure requirements for industrial solid waste landfills.[342]

Colbert's ash ponds and other waste impoundments have polluted the groundwater and surface water at Colbert for almost 30 years, with little apparent abatement. Previous attempts by TVA to stem this pollution have not worked. Yet there is no acknowledgement or even mention of this history in the site-specific NEPA review of Colbert. There is no mention of the cumulative effects of this pollution to the waters of the state in this area for potentially decades and decades, if not hundreds of years, to come. In defiance of its own data and the Consent Order, TVA simply states in the "cumulative effects" portion of the site-specific analysis, that surface and groundwater are not adversely affected by leaving Ash Pond 4 in place. Not only has TVA denied this history by omitting it from the DEIS; it has essentially ensured that Colbert

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[337] *See* Att. 67, Letter from S. Envtl. Law Ctr. to Mr. Bill Johnson, President and Chief Executive Officer, TVA, Re: 60-Day Notice of Violations and Intent to File (Feb. 13, 2013).

[338] *See* Att. 68, Complaint, *Ala. Dep't of Envtl. Mgmt. v. TVA*, No. 20-CV-2013-900123 (Ala. Cir. Ct. Colbert Cty. Apr. 12, 2013).

[339] *Id*. at 4.

[340] *Id*. at 5.

[341] *See* Att. 69, Joint Motion for Entry of Consent Decree, *Ala. Dep't of Envtl. Mgmt. v. TVA*, 20-CV-2013-900123, (Ala. Cir. Ct. Colbert Cty. May 13, 2013).

[342] *Id*. at 6.

will remain in a perpetual state of noncompliance with the Alabama Water Pollution Control Act and the Clean Water Act while polluting ground and surface waters.[343]

1. TVA claims, contrary to available evidence, that it has not determined whether the ash in Ash Pond 4 is in continuous contact with groundwater.

TVA states that "the actual depth to the uppermost aquifer has not yet been determined."[344] Location of the uppermost aquifer is one of the most important determinants of the environmental impact of coal ash disposal and storage. TVA has been monitoring groundwater at this site for at least 30 years, and for it to have been unable to determine the uppermost aquifer in that time, or have the information needed to determine the uppermost aquifer in this DEIS, seems beyond reason.

TVA has more information than it suggests. Ash Pond 4 is filled with ash to a depth (elevation) of roughly 420 feet.[345] The local bedrock water table sits at an elevation of 425-435 feet.[346] This means that even after the pond is dewatered, approximately 5 to 15 feet of ash will continue to be saturated with groundwater, contributing to an ongoing risk of groundwater contamination regardless of whether TVA caps the impoundment. TVA must identify the uppermost aquifer, determine whether and to what extent the ash in Ash Pond 4 is below the water table, and then start the NEPA process.

2. TVA fails to describe accurately the extent of existing groundwater contamination at Ash Pond 4.

TVA's analysis of groundwater contamination from Ash Pond 4 in its proposal to cap it and leave it in place falls short in several important respects. Foremost, TVA's analysis fails to acknowledge that groundwater throughout the site remains significantly contaminated. As shown by the historical data through the most recent groundwater monitoring reports, exceedances for Water Quality Goals exist in many of the groundwater wells, and this includes exceedances for heavy metals and other indicators of coal ash contamination, such as arsenic, antimony, boron, iron, sulfate and vanadium.[347]

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[343] Colbert Fossil Plant's NPDES Permit's "prohibition of pollution of groundwater" provision is an example of the state of Alabama's exercise of its delegated authority to impose permitting limitations in furtherance of the objectives of the Clean Water Act. *See* Att. 70, Ala. Dep't of Envtl. Mgmt., Colbert Fossil Plant, NPDES PermitNo. AL0003867 at pt. III.G (Jan. 7, 2008).

[344] DEIS Part II (Colbert) at 14.

[345] Att. 64, Stantec Consulting Servs., Inc., Report of Geotechnical Exploration and Slope Stability Evaluation – Ash Pond 4 – Colbert Fossil Plant, app. F (Jan. 22, 2010).

[346] Att. 71, TVA, Colbert Fossil Plant, Groundwater Incident 93-6-4,Groundwater Monitoring Report – October 2014, figs. 4, 5, tbl. 3 (Feb. 6, 2015).

[347] *See*, *e.g.*, Att. 6, TVA, Colbert Fossil Plant, Groundwater Incident 93-6-4, Groundwater Monitoring Report – April 2015 § 4.3 (July 27, 2015).

TVA does not attempt to identify, characterize or determine the cumulative impacts of this ongoing contamination in the groundwater analysis for this site. For example, the table below shows mean concentrations of key coal ash indicator pollutants at Colbert wells from 2010 – 2015. This table clearly indicates coal ash pollution of groundwater emanating from Ash Pond 4, as these wells surround Ash Pond 4.

Table 4: Mean concentrations of key coal ash indicator pollutants in up-gradient (green) and down-gradient (red)[348] monitoring wells at selected Colbert Fossil Plant wells, 2010 through September 2015.[349] Shaded cells exceed U.S. EPA guidelines for safe drinking water

	Mean boron concentration (mg/L)	Mean sulfate concentration (mg/L)	Mean antimony concentration (µg/L)	Mean arsenic concentration (µg/L)	Mean lithium concentrations (µg /L)	Mean molybdenum concentration (µg/L)	Mean vanadium concentrations (µg/L)
CA5	0.2	7	1.0	2.2	14.3	18.4	5.9
CA6	0.5	16	1.0	1.5	63.7	10.3	4.2
MC1	3.3	119	13.1	57.3	22.8	152.5	55.0
MC4	3.4	113	8.4	49.1	15.6	155.9	15.4
MC5A	2.9	100	9.3	45.2	20.0	134.0	61.7
MC5C	1.3	62	1.8	1.2	47.9	48.6	4.2
CA17A	0.2	13	2.9	1.6	14.2	10.3	6.0
CA17B	0.2	425	3.3	3.8	15.4	19.6	3.6
CA29AR	1.6	54	1.1	2.4	14.2	50.4	2.5
CA29BR	0.8	36	1.2	3.3	15.6	55.8	2.0
CA30B	0.2	123	1.2	1.4	14.1	16.7	2.5
CA31A	0.6	56	1.1	2.7	14.3	30.7	3.4

In addition, TVA's site-specific analysis in this DEIS selectively reviews a subset of groundwater monitoring wells, omitting those that show significant groundwater contamination immediately next to and likely from Ash Pond 4. By this selective analysis, TVA gives the impression that the only groundwater monitoring wells down-gradient of Ash Pond 4 are to the east of the ash pond (wells CA17A, CA17B, CA30B and CA31A).[350] It does not consider groundwater wells immediately to the west of Ash Pond 4 that have higher contamination. TVA's own reports have shown that shallow groundwater migrates radially—in all directions—

[348] Although some wells are listed as down-gradient, TVA's own groundwater monitoring reports show that groundwater likely migrates radially—in all directions—from underneath Ash Pond 4, as is discussed in more detail below.

[349] The underlying groundwater data include the September 2015 groundwater report that TVA has posted on the website accompanying the draft EIS notice. TVA has monitored additional wells in these areas in the past, including wells 6A and 13B, but has not monitored them since 2009.

[350] DEIS Part II (Colbert) at 15–16.

away from Ash Pond 4, including to the west.[351] The down-gradient wells west of the ash pond include wells MC4, MC5A, MC1, MC5C, CA29AR and CA29BR.[352] The groundwater in these wells is clearly contaminated; several bear the hallmarks of coal ash contamination, with elevated boron and sulfate, in addition to elevated concentrations of other toxic metals. The groundwater west of Ash Pond 4 also exceeds EPA safe drinking water guidelines in one or more wells. This contamination is almost certainly related to coal ash—not only are concentrations of coal ash indicators elevated in these wells, but boron, arsenic, lithium, and molybdenum were among the nine risk drivers for residential receptors identified by the EPA in its coal ash rulemaking.[353]

TVA often refers to these wells on the west side of Ash Pond 4 as "Metal Cleaning" wells because TVA used to operate a metal cleaning pond near Ash Pond 4. However, it stopped using the metal cleaning pond in 2007, and it was permanently closed in 2011.[354] Five years later, groundwater quality has not improved, suggesting that the metal cleaning pond was not the driving force of contamination, or, at the very least, that capping the metal cleaning pond in place did not stop the contamination, and both sources likely contribute to the contamination in these wells. In short, these wells are down-gradient of and contaminated by Ash Pond 4. Additionally, wells CA05 and CA06, south of Ash Pond 4 and on the other side of Hwy 72, have historically been treated as 'background' wells, but TVA has also described them as down-gradient of Ash Pond 4, and they have shown evidence of contamination.[355] They are therefore not reliable indicators of background water quality.

TVA's discussion of groundwater quality at Colbert is also off-base in that it only discusses pollutants that have exceeded state water quality goals. This approach does not help characterize the extent to which coal ash has contaminated groundwater because it fails to recognize the presence of coal ash indicator pollutants.

Not only has TVA's groundwater analysis for Ash Pond 4 in this DEIS completely ignored sensitive and important groundwater data and history, but TVA has given the impression that Alternative B will protect groundwater in the area by, among other things, continuing to provide an adequate groundwater monitoring network. As part of Alternative B, TVA states that

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[351] *See* Att. 72, Potentiometric surface from October 2013 Groundwater Assessment Monitoring Report (Oct. 17, 2013).

[352] *See* Att. 6, TVA, Colbert Fossil Plant, Groundwater Incident 93-6-4, Groundwater Monitoring Report – April 2015, fig. 1 (July 27, 2015).

[353] *See* Att. 2, Coal Ash Rule, 80 Fed. Reg. at 21,451 ("Risks to residential receptors were identified primarily from exposures to arsenic, lithium, and molybdenum in groundwater used as a source of drinking water, but additional risks from boron, cadmium, cobalt, fluoride, mercury and thallium were identified for specific subsets of national disposal practices.").

[354] Att. 73, TVA, Colbert Fossil Plant, Groundwater Incident 93-6-4, Groundwater Monitoring Report – October 2013, at 11 (Dec. 18, 2013).

[355] *Id*. at 8.

it will "install and operate groundwater monitoring system per any state requirements."[356] As TVA knows, there are no state requirements for groundwater monitoring systems for ash ponds in Alabama. TVA may have installed groundwater monitoring wells due to its past violations of the law, but there is no state law ensuring that those will continue to be monitored. The final EIS should make this fact about Alabama state law clear.

TVA's groundwater analysis for Colbert is deeply flawed, and ignores most of the relevant information that we know to be in TVA's possession. TVA must go back to the drawing board, conduct an honest appraisal of current groundwater conditions, analyze the extent to which closing Ash Pond 4 in place would leave ash in contact with groundwater, model future contamination of groundwater and surface water with site-specific data, and *then* conduct its EIS.

D. The analysis of surface water, wetlands and floodplain impacts is also inadequate.

The DEIS fails to address risks of catastrophic failure based on the instability of the dikes of Ash Pond 4 and consequent risk of surface water contamination.[357]

The DEIS also fails to address impacts to wetlands, despite the fact that Ash Pond 4 is located in the middle of a wetland. Moreover, the DEIS fails to identify removal and restoration of the wetland as a mitigation measure for impacts to wetlands.[358]

In addition, for all of the reasons stated in Part I, Sections IV.F.3 (Surface Water), IV.F.6 (Wetlands) and IV.F.5 (Floodplains), the analysis of these impacts for Ash Pond 4 is inadequate.

V. The site-specific analysis of the Bottom Ash Pond at John Sevier Fossil Plant is inadequate.

The John Sevier Fossil Plant is located on the Holston River. The map below illustrates the location of the Bottom Ash Pond in relation to current and historic surface waters and other on-site ash storage and disposal areas.

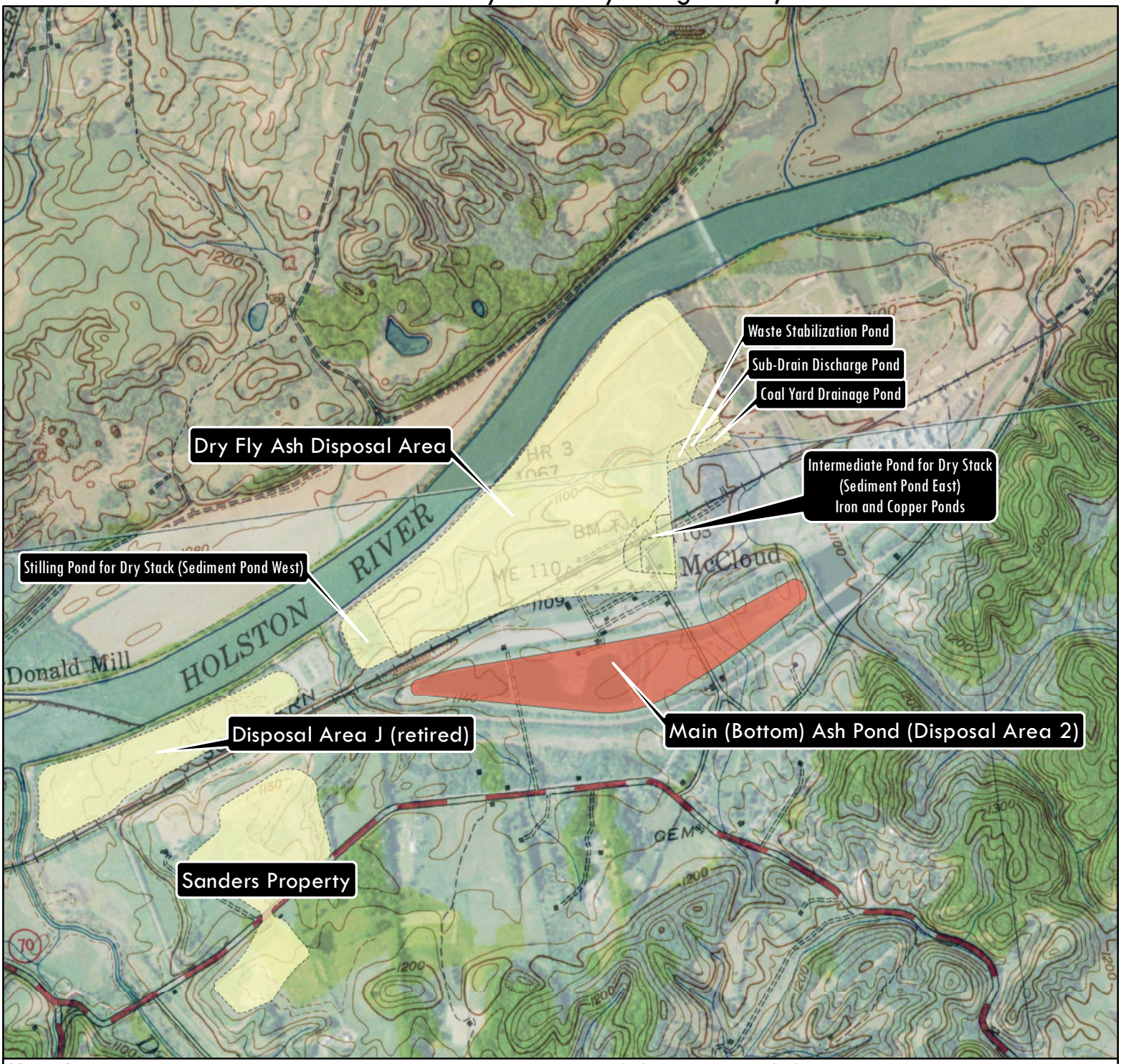
[356] DEIS Part II (Colbert) at 10.

[357] Att. 16, RT Report at 6.

[358] *Id*.

John Sevier Power Station

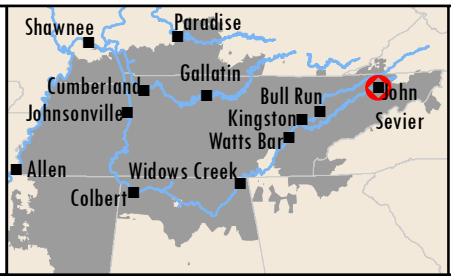
Tennessee Valley Authority - Rogersville, TN



About the Map: Historic 7.5 Minute USGS Topographic Maps (McCloud, Tn (1940); Burem, TN (1940)) are shown to display the streams and rivers present before construction of John Sevier Power Station and ash ponds The topographic maps have a transparency to reveal an aerial photograph (USDA-NAIP, 2014) beneath for reference to recent site conditions. A sinkhole type depression is identified on the topographic maps under the present Dry Fly Ash Disposal Area (Look for the letters: BM T 4)

1955: Ponds in what is now the Dry Fly Ash Disposal Area began receiving ash

Map Location Within TVA Service Territory



Legend

0 0.2 0.4 0.8 Miles

Coal Ash Unit

Cap in place proposed (2015 DEIS)

No site-specific action proposed (2015 DEIS)

Southern Environmental Law Center

DISCLAIMER: Map intended for illustrative purposes only. Ash pond and landfill boundaries are best estimates based on documents from EPA and the utilities themselves. Locations of existing and retired ash ponds and landfills were created by heads-up digitizing of aerial imagery and USGS 7.5 min. topographic maps.

Map created by Jovian Sackett (jsackett@selcnc.org) | Last Updated: 3/9/2016

A. The Bottom Ash Pond does not have to close by April 2018.

TVA creates an artificial deadline for closure of the Bottom Ash Pond before April 2018. TVA states that "[g]iven the relatively short duration of the closure schedule for this impoundment, the costs and environmental impacts associated with development and permitting of the required loading and unloading infrastructure, use of rail to transport CCR from this site would not be feasible."[359]

First, TVA identifies the Bottom Ash Pond as an active pond.[360] Active ponds do not qualify for the early closure loophole.[361] Therefore, TVA cannot close the impoundment under 40 C.F.R. § 257.100, and the April 2018 date is simply irrelevant.

As discussed in Part I, Section IV.C (Purpose and Need), even if the Bottom Ash Pond were inactive, TVA would not be required to close it by April 2018. After filling the Bottom Ash Pond with coal ash for decades, TVA artificially limits its alternatives analysis and assessment of how to safely close the pond by claiming it must hit a rapidly-approaching deadline. Giving itself a short timeline does not excuse TVA from providing the full, fair and public analysis required by NEPA.

B. TVA's self-imposed fast track to closure unreasonably constrains the alternatives analyzed for the Bottom Ash Pond.

As discussed in Part I, Sections IV.C (Purpose and Need) and IV.E (Alternatives), TVA's self-imposed and unnecessary deadline for closure unreasonably constrains the alternatives considered at the site-specific level. In any case, the difference in cost between Alternative B and Alternative C at John Sevier is not substantial, even using TVA's flawed assumptions regarding transportation (*see* Section IV.F.7 (Transportation)).[362] Environmental benefits should be the primary consideration here, as at every site analyzed in the DEIS. The environmental benefits associated with clean closure far outweigh those associated with leaving the ash in place. These benefits include (1) no potential for future ash release; (2) no continuing source of

[359] TVA, Draft Ash Impoundment Closure Programmatic EIS, Part II—Site-Specific NEPA Review: John Sevier Fossil Plant 10 (Dec. 2015) [hereinafter DEIS Part II (John Sevier)].

[360] DEIS Part I at 5; DEIS Part II (John Sevier) at 4.

[361] Despite having identified the Bottom Ash Pond at John Sevier as an active pond in the DEIS, TVA has posted on its website a notice of intent to close under 40 C.F.R. § 257.100(c). *See* Att. 74, *John Sevier Coal Combustion Residuals*, TVA, https://www.tva.gov/Environment/Environmental-Stewardship/Coal-Combustion-Residuals/John-Sevier# (last visited Mar. 8, 2016). TVA cannot utilize the early closure loophole for active ponds.

[362] Att. 16, RT Report at 8.

contamination to ground and surface water; and (3) no potential for surface water to be impacted during a flood event.[363]

C. The DEIS fails to establish accurate site-specific baseline conditions for the Bottom Ash Pond and therefore does not adequately analyze groundwater impacts.

TVA bases its analysis of groundwater impacts on the undisclosed EPRI Impact Assessment.[364] Not only is the EPRI Impact Assessment unavailable, but the DEIS fails to provide any details about the magnitude of groundwater impacts under either scenario at the Bottom Ash Pond, instead only stating that "groundwater impacts would be reduced" under the Closure-in-Place alternative, and that "the Closure-by-Removal Alternative results in a greater reduction of groundwater risk."[365]

There is no site-specific modeling beneath these claims. TVA is relying on a single hypothetical model for an idealized coal ash impoundment. TVA also states that it "is currently conducting studies to identify the uppermost aquifer, but this depth is not yet known at JSF."[366] This is not good enough. TVA must determine where the uppermost aquifer is located, determine how much coal ash would be buried beneath the water table under a closure-in-place scenario, and model impacts to groundwater and surface water using site-specific modeling inputs. This is the bare minimum amount of information that TVA would need to make a reasonably informed decision about environmental impacts under the selected alternatives.

TVA provides a very cursory statement about groundwater quality that omits important information. The John Sevier site has had serious coal ash contamination issues, primarily around the old ash ponds that are currently being used as a dry fly ash disposal area.[367] Table 5, below, summarizes groundwater quality with mean groundwater concentrations for selected constituents over the past several years.

[363] *Id*.

[364] DEIS Part II (John Sevier) at 17–18.

[365] *Id.* at 18.

[366] *Id.* at 7.

[367] *See* Att. 49, EIP Report at 89–90.

Table 5: Mean concentrations of key coal ash indicator pollutants in up-gradient (green) and down-gradient (red) monitoring wells at John Sevier Fossil Plant, April 2008 through November 2014.[368] Shaded cells exceed U.S. EPA guidelines for safe drinking water.

	Mean boron concentration (mg/L)	Mean sulfate concentration (mg/L)	Mean manganese concentration (µg/L)	Mean molybdenum concentration (µg/L)
Well 1	*0.17*	*26.7*	*26.6*	*3.0*
10-36	0.20	125.0	2,325.0	No data
10-37	0.20	47.5	445.0	No data
W28	2.86	813.0	2,791.4	3.0
W29	1.28	226.6	3,964.6	3.0
W30	4.81	1,021.1	2,671.4	3.0
W31	13.15	1,314.0	11.9	2,943.3
W32	0.23	50.0	11.2	3.7

Wells 10-36 and 10-37, immediately down-gradient of the Bottom Ash Pond, have elevated concentrations of the coal ash indicator sulfate in addition to elevated (and unsafe) concentrations of manganese. It is important to note that TVA has not measured key coal ash indicators in these wells since 2011. TVA therefore has very little information about groundwater quality around the Bottom Ash Pond. It has not measured molybdenum in these wells at all—a critical omission given the very high concentrations seen in well W31.

TVA must conduct a more comprehensive analysis of groundwater quality, in addition to a detailed assessment of the distance, if any, between the base of the bottom ash pond and uppermost groundwater aquifer, before it can make meaningful conclusions about potential groundwater impacts under alternative closure scenarios.

D. The analysis of surface water, wetlands and floodplain impacts is also inadequate.

TVA's analysis of surface water impacts contains a mathematical error. Table 3-1 shows an intake aluminum concentration of 0.26 mg/L and an Outfall 008 discharge concentration of 3.56 mg/L, and then predicts a total discharge concentration of 0.0390004 mg/L. This must be an error because the total discharge concentration would have to be at least as high as the lower of the two concentrations being mixed, so at least 0.26 mg/L. TVA appears to have correctly calculated the total discharge concentration of other pollutants—for example, barium is 0.039 mg/L at the intake, 0.047 mf/L in Outfall 008, and 0.0390004 total (reflecting the large dilution

[368] The underlying groundwater data include the September 2015 groundwater report that TVA has posted on the website accompanying the draft EIS notice. TVA has monitored additional wells in these areas in the past, including wells 6A and 13B, but has not monitored them since 2009.

provided by the Holston River). The correct total discharge concentration for aluminum should be 0.260157 mg/L.

In addition, for all of the reasons stated in Sections IV.F.3 (Surface Water), Section IV.F.6 (Wetlands) and IV.F.5 (Floodplains), the analysis of these impacts for the Bottom Ash Pond is also inadequate.

VI. The site-specific analysis of the Stilling Pond and Sluice Trench at Kingston Fossil Plant is inadequate.

The Kingston Fossil Plant is located at the convergence of the Clinch River and the Emory River. The map below illustrates the location of the Stilling Pond and the Sluice Trench in relation to current and historic surface waters and other on-site ash storage and disposal areas.

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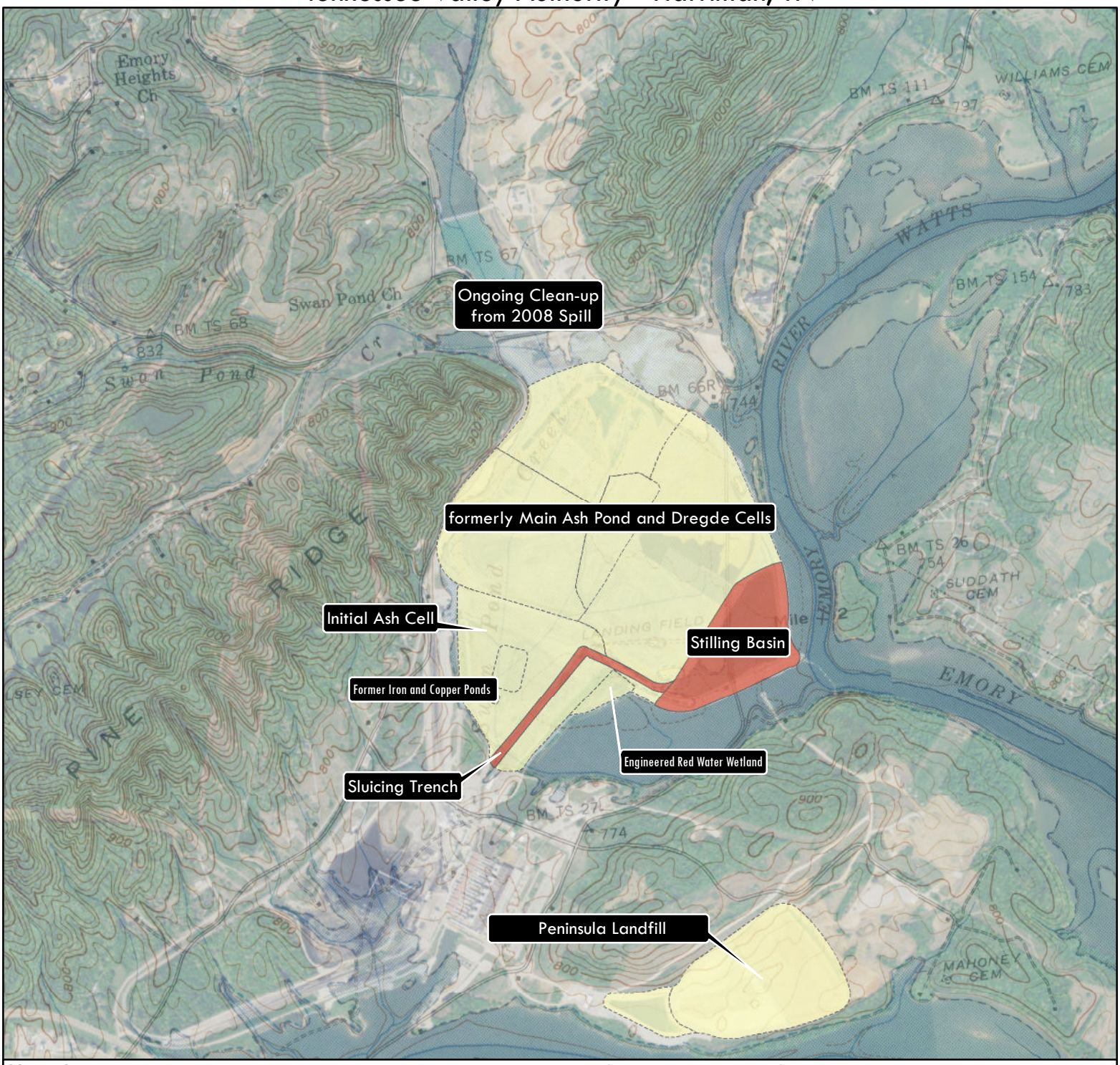
Kingston Power Station

Tennessee Valley Authority - Harriman, TN



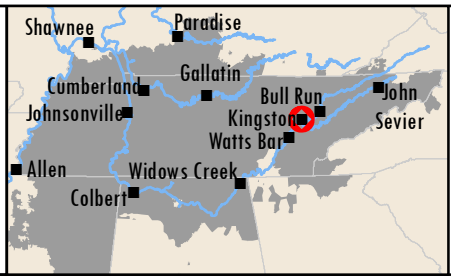
About the Map: Historic 7.5 Minute USGS Topographic Maps (Elverton, TN (1941); Harriman, TN (1941)) are shown to display the streams and rivers present before construction of Kingston Power Station, ash ponds, and the Watts Bar Reservoir. The topographic maps have a transparency to reveal an aerial photograph (USDA-NAIP, 2014) beneath for reference to recent site conditions.

1942: Construction of Watts Bar Dam completed, creating Watts Bar Reservoir.

1954-1958: Ash sluiced directly into slack water area of Watts Bar Reservoir.

1958: Dike C completed, along the northern perimeter of the former Main Ash Pond.

Map Location Within TVA Service Territory



Legend

0 0.25 0.5 1 Miles

Coal Ash Unit

Cap in place proposed (2015 DEIS)

No site-specific action proposed (2015 DEIS)

Southern Environmental Law Center

DISCLAIMER: Map intended for illustrative purposes only. Ash pond and landfill boundaries are best estimates based on documents from EPA and the utilities themselves. Locations of existing and retired ash ponds and landfills were created by heads-up digitizing of aerial imagery and USGS 7.5 min. topographic maps.

Map created by Jovian Sackett (jsackett@selcnc.org) | Last Updated: 3/9/2016

A. The Stilling Pond and Sluice Trench do not have to close by April 2018.

As explained in Part I, Section IV.C (Purpose and Need), TVA voluntarily restricts itself to a two-year timeline for coal ash closure activities, then uses that restriction to avoid examining otherwise appropriate alternatives and to make decisions about the feasibility of alternatives based on that timeline. TVA's NEPA review should determine the construction schedule, not the other way around.

Nevertheless, the DEIS inaccurately suggests that TVA is constrained by the early closure loophole. It is not. After filling the Stilling Pond and Sluice Trench with coal ash for decades, TVA artificially limits its alternatives analysis and assessment of how to safely close these ponds by claiming it must hit a rapidly-approaching deadline. Giving itself a short timeline does not excuse TVA from providing the full, fair and public analysis required by NEPA.

B. TVA's self-imposed fast track to closure unreasonably constrains the alternatives analyzed for the Stilling Pond and Sluice Trench.

Similar to its Bull Run site-specific analysis, in the Kingston site-specific analysis, TVA uses the two-year time frame to reject Alternative C (clean closure) as unreasonable.[369] By eliminating Alternative C, TVA is left with only one remaining alternative, closure in place without excavating and removing the ash. Its elimination of any alternatives other than the one that it ultimately selected, like its decision to consider only the closure schedule that would allow it to claim the early closure exemption, is plainly improper under NEPA regulations.

TVA's exclusion of Alternative C from further consideration is based on several improper conclusions. First, it claims that "extended duration of normal removal operations" combined with the "additional time required to haul borrow material" would cause removal activities to extend beyond the April 2018 self-imposed deadline.[370] TVA goes on to explain that increasing truck traffic that would allow it to meet its own artificial two-year timeline would result in 244 trucks a day on the haul route.[371] Again, TVA is impermissibly constraining the alternatives by restricting itself to a "relatively short duration closure schedule." It cannot begin the NEPA process by assuming a fixed closure schedule. Instead, it must go back to the drawing board and allow its environmental analysis to determine the appropriate closure schedule.

Like the Bull Run-specific analysis, the Kingston analysis does not identify the nearest Subtitle D landfill that would be the most likely permanent storage facility for removed coal ash. Yet TVA claims that both "potential impacts related to increased air and noise emissions" and "potential impacts to environmental justice populations located along the haul route" caused by transporting removed ash to the new Subtitle D landfill are significant enough to make

[369] DEIS Part II (Kingston) at 8.

[370] *Id*.

[371] *Id.*

Alternative C inappropriate for this location. Without more information on where the closest available and suitable Subtitle D landfill location is in relation to Kingston, it is impossible to address the validity of TVA's claims.[372]

TVA also rejects removal by rail as infeasible or not cost effective because of the "relatively short duration of the closure schedule for this impoundment."[373] TVA must adequately support claims that provide the basis for dismissing otherwise appropriate alternatives from further analysis and has failed to do so in this instance.[374]

C. The DEIS fails to establish accurate site-specific baseline conditions for the Stilling Pond and Sluice Trench, and therefore does not adequately analyze groundwater impacts.

Location of the uppermost aquifer is one of the most important determinants of the environmental impact of coal ash disposal and storage.[375] In its analysis, TVA admits that it does not know the location of the uppermost aquifer at this site.[376] It cannot conduct meaningful NEPA analysis without this underlying information. TVA acknowledges that an "important consideration for alternative development" is the "[r]isk of potential release and degradation of sensitive environmental resources (groundwater, surface water, ecological receptors and factors related to the human environment) with a defined nexus to the CCR impoundment."[377]

It is well-established that the Kingston plant is located in an unstable area with karstic features.[378] As discussed in Part I, Section IV.E, the on-site Peninsula Landfill experienced sinkholes, leading to corrective action by the State of Tennessee. The DEIS contains no analysis of the risk of groundwater and surface water contamination from collapse of the bedrock, despite the site's history of sinkhole development. In fact, the DEIS appears to suggest that the Peninsula Landfill is a model of responsible ash management in an unlined landfill.[379] The history of the landfill suggests otherwise.

Properly assessing risks posed by a release of coal ash waste requires basic knowledge of the water table and hydrogeologic pathways. Compliance with NEPA requires that TVA first complete studies to determine the location of the uppermost aquifer, and the potential for sinkhole development and other hydrogeological issues, and then conduct the proper analysis of the risks associated with the closure-in-place alternative.

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[372] *See* Part I, Section IV.F.7 (Transportation); Att. 32, Atherton Report at 2.

[373] DEIS Part II (Kingston) at 7.

[374] *See* Sections IV.C (Purpose and Need) and IV.E (Alternatives).

[375] *See* Part I, Section IV.F.2 (Groundwater); Att. 16, RT Report at 10.

[376] *Id.*

[377] *Id.*

[378] Att. 5, Quarles Report ¶ 17.

[379] DEIS Part II (Kingston) at 16.

TVA claims "the in-place closure scenario provided a positive impact compared to baseline."[380] This claim, however, is extrapolated from EPRI's analysis of a "hypothetical" impoundment.[381] As discussed in Section IV.A, the EPRI Impact Assessment was not shared with the public during the public comment period, and the public has not had an opportunity to review and comment on the assumptions, design and other characteristics of the hypothetical impoundment or the study's findings. From the brief description in the EIS, we must assume that the study of a "hypothetical CCR impoundment" is inadequate due to the lack of information about how similar or dissimilar the hypothetical impoundment is to the coal ash placement and hydrologic conditions at Kingston. Without analyzing the facts on (and in) the ground, EPRI and TVA cannot possibly reach the conclusions cited above. The reference to a "2.5 to 7-fold increase in positive impact," without any context, and without access to the EPRI study, is meaningless.

TVA repeatedly implies that the groundwater at Kingston is not contaminated, despite abundant evidence to the contrary. TVA states:

> Potential human health risk was also considered by reviewing the results of groundwater monitoring and the incidence of surface water releases from the Stilling Impoundment and Sluice Trench to receiving waterbodies. *No records of releases or issues of concern are known that represent a risk to human health from CCR constituents associated with the existing impoundment*.[382]

TVA relies on TDEC groundwater standards and extremely intermittent testing results to downplay the amount of currently known groundwater contamination at the Kingston site. TVA acknowledges arsenic and cobalt contamination in the groundwater, but claims that these testing results were anomalies.[383]

TVA's discussion of TDEC groundwater standards is clearly intended to imply that there are no groundwater quality issues at Kingston, or that there are no "issues of concern."[384] This is unsupported by the available evidence, which unambiguously demonstrates that the coal ash disposal areas at Kingston have contaminated local groundwater, and will continue to do so

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[380] *Id.* at 24.

[381] *Id.*

[382] *Id.* at 6 (emphasis added).

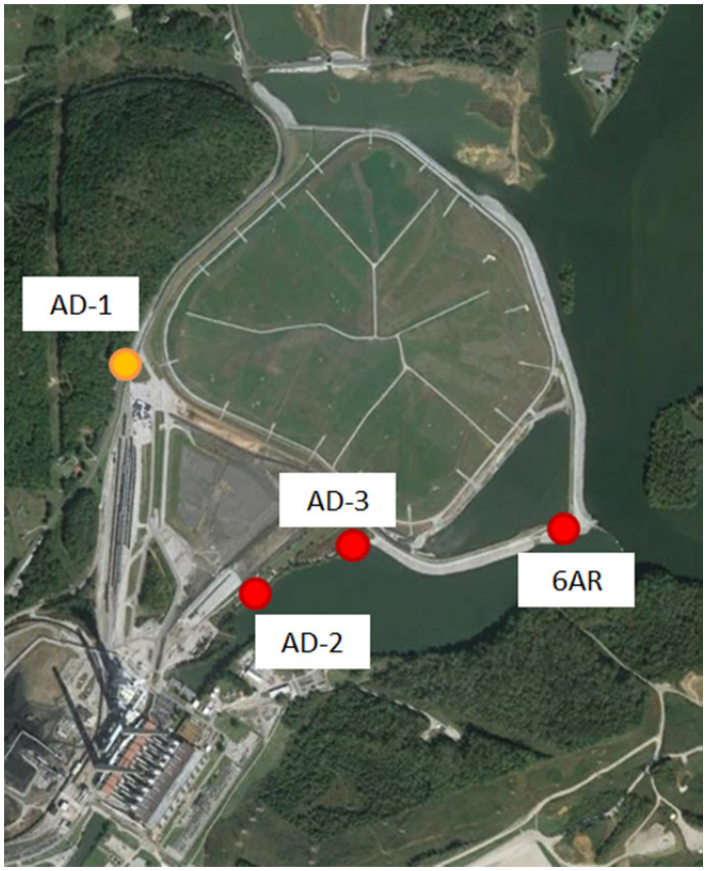
[383] *Id.* at 15 ("Groundwater concentrations exceeded the Groundwater Protection Standard (GWPS) for arsenic (10 micrograms per liter [µg/L]) in KIF-22 during the December 2014 sampling event. GWPS are as defined in Section IV(1)(d) of TDEC Ground Water Monitoring Guidance for Solid Waste Landfill Units Policy. Per Policy, GWPS are the constituent maximum contaminant levels (MCL) listed in Appendix III of Rule 0400-11-01-.04. The GWPS were established in May 2012. GWPS include MCLs as well as additional state standards for metals that do not have MCLs. This was the only sample that has exceeded the GWPS. This well was resampled for arsenic in February 2015 and the concentration was below the GWPS. Overall, the trends appear stable, with the exception of arsenic (KIF-22 in 2014) and cobalt (KIF-AD3). Arsenic levels fluctuate but remain below the GWPS.").

[384] *Id.* at 6.

unless the ash is removed. If the ash is not removed, the local groundwater will most likely be unsafe to drink for the foreseeable future.

TVA has monitored several groundwater wells around the stilling pond, sluice trench, and ballfield area over the past several years (since 2010). These wells are shown in Figure 2 below.

Figure 2: Groundwater wells that TVA monitored between 2010 and 2015 near the Kingston stilling pond, sluice trench, and ballfield.



As shown in Table 6 below, all three down-gradient wells show concentrations of coal ash indicator pollutants – boron and sulfate – that are much higher than background (up-gradient well AD-1), which means that the groundwater is contaminated by coal ash. Concentrations of cobalt and manganese in these wells are well above safe drinking water guidelines. Manganese in well 6AR is more than 100 times higher than the EPA lifetime health advisory of 0.3 mg/L.

In short, the local groundwater is currently hazardous to human health. To the extent that the coal ash left in the stilling pond and sluice trench is below the local water table, these

pollutants will continue to leach out of the ash for the foreseeable future, regardless of whether TVA caps the two areas. This would render the groundwater useless for human use for decades to come. As the contaminated groundwater migrates into the local surface water and sediment, it will present additional risks to the local ecosystem.

Table 6: Mean concentrations of key coal ash indicator pollutants in up-gradient (green) and down-gradient (red) monitoring wells at selected Kingston Fossil Plant wells, 2010 through September 2015.[385] Shaded cells exceed U.S. EPA guidelines for safe drinking water (see EIP Report for more detail).

	Mean boron concentration (mg/L)	Mean cobalt concentration (µg /L)	Mean manganese concentration (mg/L)	Mean sulfate concentration (mg/L)
AD-1 (background)	*0.13*	*1.58*	*0.07*	*23.6*
AD-2	0.62	7.07	1.00	148.6
AD-3	0.87	4.30	7.34	292.8
6AR	0.62	106.00	31.35	223.5

D. The analysis of surface water, wetlands and floodplain impacts is also inadequate.

TVA asserts that "surface water flow and potential lateral movement and groundwater flow to surface waters would be minimized" by the closure-in-place option.[386] This assertion is entirely unsupported. As discussed above, neither TVA nor EPRI has actually analyzed local conditions at the site. In addition, "minimized" could mean anything from "slightly reduced" to "almost entirely eliminated." Even if one assumes that groundwater flow will be reduced–an assumption for which TVA has presented no support–the idea that groundwater flow to surface waters would be 'minimized' does not say anything about whether the remaining flow of groundwater to surface water would cause or contribute to ongoing contamination.

In its discussion of surface water quality and impacts, TVA also fails to properly assess the impacts to surface water caused by the rerouting of the current waste stream discharged through Outfall 001. TVA acknowledges that recent surface water testing has shown thallium contamination, but claims this is merely a result of testing methods and calculations.[387] However, it goes on to state that "[i]mpacts associated with re-routing of these waste streams would be evaluated at a later time in a subsequent NEPA evaluation and design process."[388]

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[385] The underlying groundwater data include the September 2015 groundwater report that TVA has posted on the website accompanying the draft EIS notice. TVA has monitored additional wells in these areas in the past, including wells 6A and 13B, but has not monitored them since 2009.

[386] *Id.*

[387] DEIS Part II (Kingston) at 22 ("The thallium exception is an artifact produced by the method of treating censored data in mass balance calculations (i.e., values below detection limits set equal to one-half detection limit) and the fact that the thallium detection limit of 0.002 mg/L exceeds the TDEC criterion of 0.00024 mg/L.").

[388] *Id.*

This deferral of an impacts analysis until some unspecified future time is impermissible under NEPA regulations. TVA must include all necessary and relevant information and analysis associated with environmental impacts of its action. It also admits that there is currently "not enough information available to produce future operations mixing analysis."[389] The failure to analyze the impacts of re-routing Outfall 001, as well as its failure to provide information on the effects closure-in-place would have on future surface water quality, is a violation of NEPA.

In addition, for all of the reasons stated in Part I, Sections IV.F.3 (Surface Water), IV.F.6 (Wetlands) and IV.F.5 (Floodplains), the analysis of these impacts for the Bottom Ash Pond is inadequate.

VII. The site-specific analysis of the Ash Impoundment Complex at Widows Creek is inadequate.

TVA's Widows Creek Fossil Plant is located in northeast Alabama, approximately five miles from Stevenson, Alabama, on the west bank of the Tennessee River, at the confluence of the Tennessee River and Widows Creek. At the point where it passes the plant, the Tennessee River forms the upper reaches of the Guntersville Reservoir. Widows Creek flows southward through the site, between the main ash complex and the gypsum stack, before discharging into the Tennessee River. Before TVA built the main ash complex, Widows Creek ran through the site where the main ash pond is now. TVA rerouted the creek to build the ponds, and also constructed wetlands to the north of the ash pond. The map below illustrates the location of the Ash Impoundment Complex in relation to current and historic surface waters and other on-site ash storage and disposal areas.

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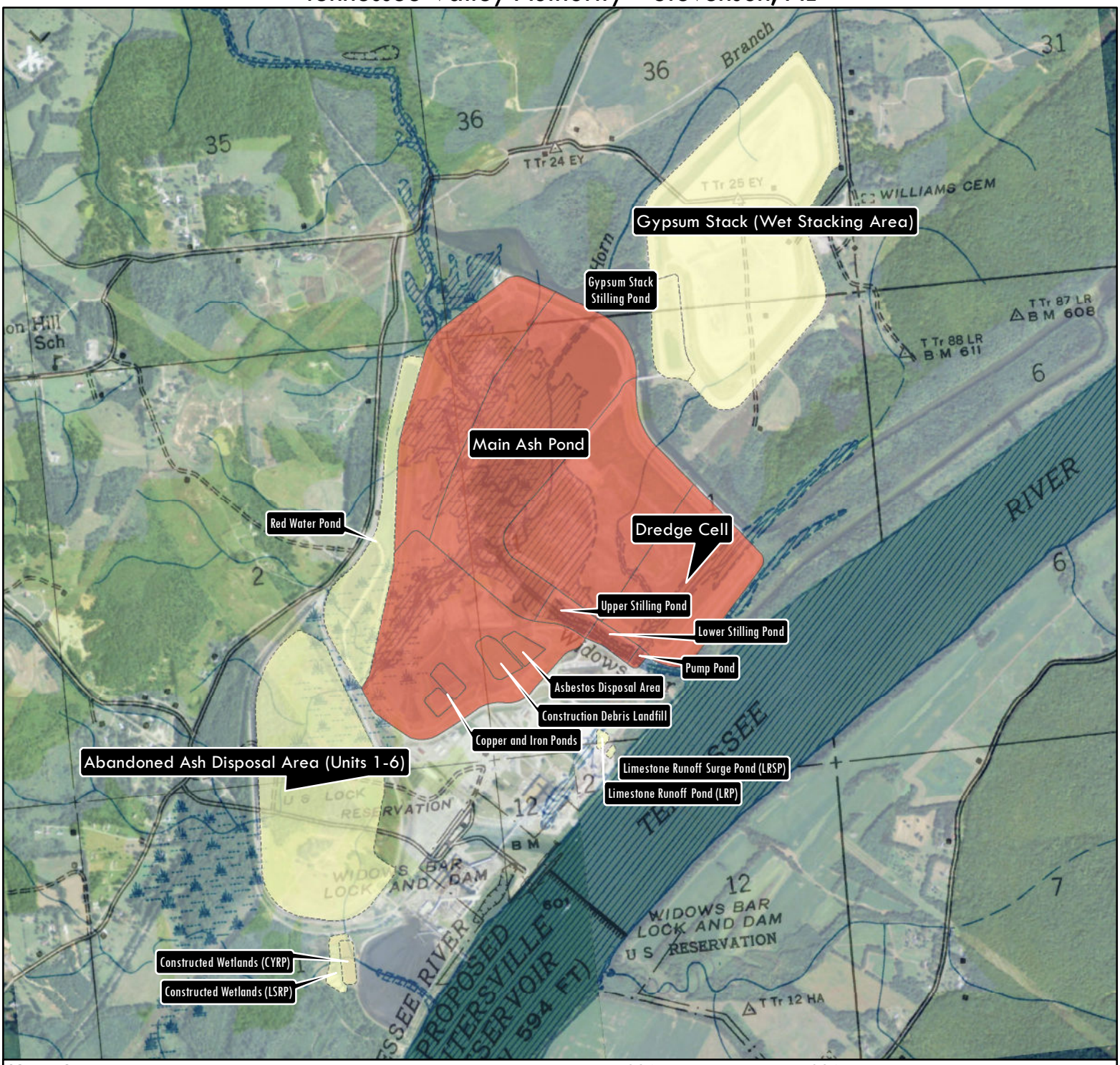
[389] *Id.* at 24.

Widows Creek Power Station

Tennessee Valley Authority - Stevenson, AL



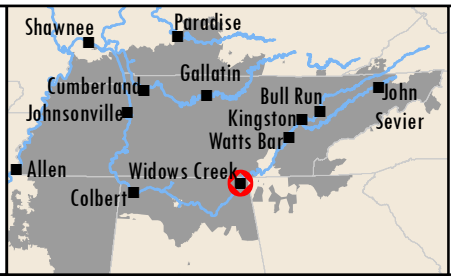
About the Map: Historic 7.5 Minute USGS Topographic Maps (Bridgeport, AL (1936); Doran Cove,AL (1936)) are shown to display the streams and rivers present before construction of Widows Creek Power Station, ash ponds, and the Guntersville Reservoir. The topographic maps have a transparency to reveal an aerial photograph (USDA-NAIP, 2014) beneath for reference to recent site conditions.

1939: Construction of Guntersville Dam completed, creating Guntersville Reservoir.

1952: Ash Disposal Area 1 began recieving ash

1959: Ash Disposal Area 2 (Main Ash Pond, today)began recieving ash.

Map Location Within TVA Service Territory



Legend

0 0.25 0.5 1 Miles

Coal Ash Unit

Cap in place proposed (2015 DEIS)

No site-specific action proposed (2015 DEIS)

Southern Environmental Law Center

DISCLAIMER: Map intended for illustrative purposes only. Ash pond and landfill boundaries are best estimates based on documents from EPA and the utilities themselves. Locations of existing and retired ash ponds and landfills were created by heads-up digitizing of aerial imagery and USGS 7.5 min. topographic maps.

Map created by Jovian Sackett (jsackett@selcnc.org) | Last Updated: 3/9/2016

Widows Creek Fossil began operating in 1952, and by early 1965, all eight generators, with a combined capacity of approximately 1,950 MW, were in full operation. After operating Widows Creek Fossil for over 50 years, TVA has now retired or idled all eight units. First, units 1-6 were retired between May 2012 and July 2013 as required by a 2011 settlement (Federal Facilities Compliance Agreement) between TVA and EPA, as well as by a parallel consent decree signed by TVA, several states, and three environmental groups to resolve alleged Clean Air Act violations at its coal plants. In September 2014, TVA idled unit 8 and has now retired it, and in September 2015, TVA retired the final unit, unit 7.

During its many decades of operation, Widows Creek Fossil Plant generated millions of tons of coal ash, scrubber waste and other byproducts of the coal combustion process. Before the units were retired, the facility consumed approximately 10,000 tons of coal per day and generated approximately 280,000 tons of fly ash, 110,000 tons of bottom ash, and 750,000 tons of scrubber waste each year. Most of this waste has been stored in wet form in multiple on-site lagoons.

In early 2014, TVA published an Environmental Assessment to close the gypsum stack (Gypsum Stack EA), one of the impoundments at the site.[390] The gypsum stack, a 160-acre facility with approximately 12 million cubic yards of coal ash, is located on the east side of Widows Creek.[391] If TVA is acting in accordance with the Gypsum Stack EA, TVA is going to cover or has covered the gypsum stack with a final cover consisting of a flexible membrane layer, overlain by geocomposite drainage layer and cover soil.[392] TVA anticipates that it would take 48 months (four years) to close the gypsum stack.[393]

The Widows Creek ash impoundments have had a long history of groundwater contamination, seepage and at least one major spill. In January 2009, less than one month after the Kingston spill, the gypsum stack's dam failed and spilled approximately 10,000 gallons of gypsum slurry into Widows Creek and the Tennessee River.[394] As part of a 2009 Consent Order issued by ADEM[395] to address this spill and other unpermitted discharges, TVA attempted to fix

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[390] Att. 75, TVA, Envtl. Assessment, Widows Creek Fossil Plant Soil Excavation and Gypsum Stack Closure (Feb. 2014), https://www.tva.gov/file_source/TVA/Site%20Content/Environment/Environmental%20Stewardship/Environmental%20Reviews/Widows%20Creek%20Fossil%20Plant%20Soil%20Excavation%20and%20Gypsum%20Stack%20Closure/WCF%20Final%20Soil%20Excavation%20EA.pdf [hereinafter Gypsum Stack EA].

[391] *Id.* at 1.

[392] *Id.* at 9.

[393] *Id.*

[394] Att. 76, Shaila Dewan, *Waste Spills at Another T.V.A. Power Plant*, The New York Times (Jan. 9, 2009), http://www.nytimes.com/2009/01/10/us/10sludge.html

[395] Att. 63, Consent Order, *In re: TVA Widows Creek Fossil Plant, NPDES Permit No. AL0003875*, No. 10-002-CWP (Ala. Dep't of Envtl. Mgmt. Oct. 13, 2009).

seepage issues by making stability improvements and constructing reverse graded filter systems around the gypsum stack and the Main Ash Pond.[396]

The Ash Impoundment Complex at issue in this DEIS consists of the main ash impoundment, dredge cell and upper and lower stilling pond. These impoundments are located on the opposite bank of Widows Creek from the gypsum stack, on the west side of Widows Creek. Together, the complex spans 350 acres and contains 25 million cubic yards of coal ash.[397] Of the facilities that TVA currently proposes to close, the impoundments at Widows Creek are by far the largest—almost 300 acres and 20 million cubic yards larger than the second largest coal ash impoundment complex evaluated in Part II of the DEIS.[398]

Summarily dismissing Alternative C (clean closure) as unreasonable for logistical, environmental and economic reasons, TVA proposes to close the ash impoundment complex at Widows Creek in place within two years. Again, it TVA chooses closure in place to comply with an arbitrary and self-imposed deadline. TVA has determined that closure in place will cost $200 million, as compared to closure by removal, which TVA estimates to cost $2 billion. It also determined that closure in place would take approximately two years, while closure by removal would take 70 years, based on the normal trucking rate.[399]

These Widows Creek -specific comments will address the following issues with TVA's NEPA process and its flawed analysis for closing the coal ash impoundments at Widows Creek Fossil: (1) the April 17, 2018 deadline is an artificial time limit and should not be considered the deadline for closing the impoundments; (2) TVA failed to adequately analyze closure by removal at the facility level; and (3) TVA failed to take site-specific factors and information into account when proposing to close in place.

A. The Ash Impoundment Complex does not have to close by April 2018.

TVA bases its decision to close rather than excavate the ash impoundments at Widows Creek Fossil on an artificial April 2018 deadline—a deadline that cannot be met even by TVA's own estimation. There is no reason to rush closure to comply with an April 2018 deadline when: (1) TVA asserts that the Coal Ash Rule does not apply to Widows Creek Fossil; and (2) if the Rule does apply, there is no requirement by the Coal Ash Rule that inactive impoundments be closed by April 2018.

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[396] *See, i.e.*, Att. 77, Memo from Cynthia Anderson, TVA, to Brian Marshall, ADEM, Consent Order No. 10-002-CWP Modification Report, Semiannual Update (Mar. 29, 2013).

[397] DEIS Part II (Widows Creek) at 4.

[398] *Id.* at 4; DEIS Part II (Kingston) at 4; DEIS Part II (John Sevier) at 4; DEIS Part II (Colbert) at 4; DEIS Part II (Bull Run) at 4; DEIS Part II (Allen) at 4.

[399] DEIS Part II (Widows Creek) at 5, 8–9. As discussed in Part I, Section IV.F.1, these estimates likely are inaccurate and inflated.

Citing § 257.50 of the CCR regulations, TVA states that the EPA's Coal Ash Rule "does not apply to power plants like Widows Creek Fossil that have ceased producing electricity prior to October 19, 2015."[400] The Widows Creek Fossil DEIS nevertheless explains that even though in TVA's view the Coal Ash Rule does not apply to Widows Creek Fossil, it still intends to close the plant within two years.[401] TVA bases its decision to close in place in part because of the short two-year schedule for closure that applies to inactive surface impoundments: "Time necessary to complete closure activities at a CCR impoundment may affect the reasonability of closure alternatives."[402]

TVA's assertion that the Ash Impoundment Complex must be closed by April 17, 2018 is incorrect and should not be used to justify closure in place. First, TVA states that the Coal Ash Rule does not apply to Widows Creek Fossil;[403] if that is the case, the April 2018 date is irrelevant. Second, even though TVA states that the Coal Ash Rule does not apply, it then refuses to consider closure by removal because of the accelerated closure timeline.[404]

Assuming that TVA is trying to close by the April 2018 deadline so it can be exempt from the post-closure requirements in the Coal Ash Rule, there is still no *requirement* that an inactive surface impoundment be closed by that date, as explained in Section IV.C (Purpose and Need). In fact, for large surface impoundments like Widows Creek, EPA recognizes that the impoundments may not be able to close by the April 2018 deadline. It can take several years just to dewater impoundments the size of Widows Creek.[405] Widows Creek is precisely the type of facility that needs careful monitoring and oversight–a large surface impoundment that, because of its size, as well as its history of groundwater and surface water contamination, has a greater potential for health and environmental impacts.

Inany event, the EIS for Widows Creek cannot use the April 2018 deadline to justify closure in place over closure by removal because TVA estimates that the Widows Creek closure will be finished by *December* 2018, not April 2018.[406] If the Ash Impoundment Complex is subject to the Coal Ash Rule, TVA's current closure timeline would not relieve it of post-closure requirements. TVA cannot base its decision to fast-track closure of Widows Creek on a deadline that it cannot meet and is not required to meet.

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[400] *Id.* at 1.

[401] *Id*.

[402] *Id.* at 5.

[403] 40 C.F.R. § 257.50(e).

[404] *See, i.e.*, DEIS Part II (Widows Creek) at 8 ("It would take 1,667 calendar days (4.5 years) to move all of the CCR, which is well beyond the April 2018 timeframe to haul off the CCR.").

[405] Att. 2, Coal Ash Rule, 80 Fed. Reg. at 21,415 ("[C]ommenters pointed out that dewatering of a surface impoundment alone can take several years to complete because impoundments can be hundreds of acres in size.").

[406] DEIS Part II (Widows Creek) at 4.

After filling the Ash Impoundment Complex with coal ash for decades, TVA artificially limits its alternatives analysis and assessment of how to safely close the pond by claiming it must hit a rapidly-approaching deadline. Giving itself a short timeline does not excuse TVA from providing the full, fair and public analysis required by NEPA.

B. TVA's self-imposed fast track to closure unreasonably constrains the alternatives analyzed for the Ash Impoundment Complex.

TVA spends a mere one and a half pages discussing clean closure at Widows Creek Fossil[407] and summarily dismisses it as a viable alternative, stating that "it was determined to be unreasonable for logistical, environmental, and economical reasons."[408] The DEIS does not look at the environmental impacts of clean closure or evaluate them against the impacts of covering coal ash in place. In its alternatives analysis for Widows Creek, TVA failed to consider important factors in both closure in place and closure by removal when it determined that closure in place was the preferred alternative.

First, TVA likely underestimated the cost for closure in place, estimating that closure in place would cost $200 million, compared to $2.7 billion to close by removing the ash.[409] While there are no data provided to support either cost estimate, TVA has likely failed to account for the ongoing liability associated with keeping the unlined waste in the ground when it considered closure in place, as discussed in Part I, Section IV.F.1.

Contamination of the ground and surface water through leaching and seepage is an unpermitted discharge of pollutants in violation of the Clean Water Act, the Alabama Water Pollution Control Act, and Widows Creek's NPDES permit issued by ADEM. The facility's current NPDES permit states that "the discharge of pollutants to groundwater is prohibited."[410] In addition, the Alabama Water Pollution Control Act includes groundwater in its definition of waters of the State, and any unpermitted discharge to groundwater is a violation of the AWPCA.[411] TVA is and will be liable for pollution to ground and surface waters. The increased cost of this liability and future corrective action should be accounted for in the cost estimates.

Second, TVA has likely overestimated the cost to excavate and remove the ash at Widows Creek at $2.7 billion. However, there are no data to back up that number, just TVA's

[407] *Id.* at 8–9.

[408] *Id.* at 8.

[409] *Id.* at 8–9.

[410] Att. 9, Ala. Dep't of Envtl. Mgmt., Widows Creek Fossil Plant, NPDES Permit No. AL0003875 at pt. III.G (Mar. 8, 2005).

[411] Ala. Code §22-22-1(b)(2); *see* Ala. Admin. Code r. 335-6-6.02(fff).

unsupported statement that it is for "CCR excavation and transport, borrow transport and placement."[412]

Next, TVA has incorrectly analyzed and likely overstated the amount of time to excavate and remove the Widows Creek ash to dry, lined storage. TVA very briefly discusses both rail and trucking as methods to remove the ash, and concludes that trucking at a normal rate would take 70 years. For rail, TVA states:

> [R]ail transport was . . . not appropriate for those impoundments having a large volume of CCR and a relatively short duration closure schedule . . . . Given the large volume of CCR materials at this impoundment, the costs and environmental impacts associated with development and permitting of the required loading and unloading infrastructure, use of rail to transport CCR from this site would not be feasible."[413]

TVA then analyzes the timeframe for shipping coal ash by rail to Arrowhead landfill, stating that it would take 4.5 years to move all of the coal ash based on the landfill's ability to accept 15,000 million cubic yards per day.[414] TVA ruled out rail as a possibility, in part because the 4.5-year timeline "is well beyond the April 2018 timeframe to haul off CCR."[415] However, 4.5 years is not an unreasonable amount of time to close an ash impoundment. It is well within Coal Ash Rule's five-year timeline for closure of surface impoundments.[416]

In any event, TVA failed to analyze several alternatives to hauling the coal ash to the Arrowhead landfill when it analyzed removing the ash by rail. Arrowhead, which is hundreds of miles from Widows Creek Fossil, is an unacceptable option for off-site storage of coal ash due to its history of violations, compliance problems and environmental justice issues. TVA did not consider any landfills closer in distance nor any that may be able to accept more coal ash each day.

TVA also failed to analyze the option of an on-site coal ash landfill—one that complies with all location restrictions in the Coal Ash Rule, including the requirements for unstable areas. It did consider the option of an on-site landfill in its 2014 Environmental Assessment for the closure of the gypsum stack, and estimated that a 155-acre, on-site landfill would cost $108 million, but failed to do so in this DEIS.[417] TVA should adequately and objectively analyze all removal options.

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[412] DEIS Part II (Widows Creek) at 9; *see also* Section IV.F.1 (Costs and Timing).

[413] DEIS Part II (Widows Creek) at 8.

[414] *Id.*

[415] *Id.*

[416] 40 C.F.R. § 257.102(f)(1)(ii) ("[T]he owner or operator must complete closure of the CCR unit . . . [f]or existing and new CCR surface impoundment, within five years of commencing closure activities.").

[417] Att. 75, Gypsum Stack EA at 14.

Finally, TVA has failed to consider the benefits on economic development of clean closure. In June 2015, Google announced plans to build a $600 million data center on the Widows Creek site and intends to power the facility with 100% renewable energy.[418] It will add 75 to 100 jobs and be one of the only 14 Google data processing centers in the world.

Impoundments that are cleanly closed can be used for other purposes. EPA acknowledges in the Coal Ash Rule that "clean closure is generally preferable from the standpoint of land re-use and redevelopment."[419] The areas surrounding the Google data center may be useful for a variety of purposes, including installing renewable energy such as solar panels or building other industries that may be attracted to the site because of its proximity to Google. Closing the impoundments in place means that the site cannot be used for anything in the future. Another benefit of clean closure that should be taken in account is the fact that TVA would not have to conduct groundwater monitoring and other post-closure care for the Widows Creek site after it completes closure.[420]

C. The DEIS fails to establish accurate site-specific baseline conditions for the Ash Impoundment Complex and therefore does not adequately analyze groundwater impacts.

TVA has not provided sufficient information about the geology of the site and the depth or quality of the groundwater to make a reasonable assessment of alternative closure methods. Since the site presents ongoing structural risks due to the presence of karstic bedrock, and since the limited available evidence shows that TVA has already contaminated local groundwater, TVA must go back to the drawing board, conduct a comprehensive review of hydrology, geology and groundwater quality, determine whether any coal ash would remain below the water table after closure in place, and then begin its environmental review.

1. The Ash Impoundment Complex is located in an unstable area and ash is likely located within the water table.

Widows Creek is situated in karst topography, which consists of highly soluble rocks that are known for caves and sinkholes, and are vulnerable to groundwater pollution. TVA has known about the site's vulnerability for decades, yet only cursorily mentions it in the DEIS. A 1990 study by TVA noted the topography around Widows Creek Fossil: "As in all karst terrains, solution activity along faults, bedding plans, joint and fractures produces enlarged opening and

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[418] Att. 78, Tim Omarzu, *Google to Build $600 Million Data Processing Center at Widows Creek Plant in Alabama*, Chattanooga Times Free Press (June 24, 2015), http://www.timesfreepress.com/news/business/aroundregion/story/2015/jun/24/google-build-600-million-data-processing-center-near-widows-creek-plant-alabama/311288/.

[419] Att. 2, Coal Ash Rule, 80 Fed. Reg. at 21,412.

[420] *Id.*

effective routes for groundwater movement."[421] TVA also notes the karst terrain in the site-specific DEIS, saying that "solution weathering may result in karst development, with sinkholes as the primary and commonly recognizable feature."[422] EPA defines "unstable area" in the Coal Ash Rule as "a location that is susceptible to natural and human-induced events or forces capable of impairing the integrity, including structural components of some or all of the CCR unit that are responsible for preventing releases from such unit" and includes "karst terrains" as one example of an area that can be unstable.[423]

The location of groundwater and the uppermost aquifer must also be considered in the DEIS. Coal ash that is left in contact with groundwater can lead to decades of groundwater contamination. The degree to which ash is left in contact with groundwater is a critical piece of information to consider when determining whether to close in place or close by removal. At Widows Creek Fossil, groundwater is located close to the surface and is currently mounding under the impoundments. A historic document in a 2010 Stantec report conducted a soils investigation at that the location of a proposed scrubber sludge disposal cell and found that the groundwater was reported at 1-foot below the ground surface.[424] When discussing the feasibility of the proposed disposal cell, the report said, "The high natural moisture content of the clays, the presence of rubble, and the high water table, however may make excavation and subsequent fill placement and compaction difficult."[425] To date, TVA has not finished evaluating the depth of the uppermost aquifer at Widows Creek Fossil and is still evaluating groundwater characteristics. Without this information, the DEIS cannot make an informed decision on the closure method.

While TVA notes the risk of sinkholes and groundwater movement underlying the ash impoundments at Widows Creek, and while EPA discusses the instability of such terrain, TVA fails to consider the karst topography in making its decision to close the impoundments in place. This karst terrain is a feature that creates a risk of groundwater and surface water contamination if the ash is left in place. Furthermore, groundwater is known to be located close to the surface, but TVA has not finished evaluating the depth of the uppermost aquifer. Without knowing more about the location of groundwater and its relation to the ash impoundments, TVA cannot make an informed decision on how to close these impoundments.

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[421] Att. 79, TVA Eng'g Lab., Rep. No. WR28-1-34-107, WCF Assessment of Potential Effects on Groundwater of the Phase II FGD Pond, at 6 (1990).

[422] DEIS Part II (Widows Creek) at 15.

[423] 40 C.F.R. § 257.53.

[424] Att. 80, Stantec Consulting Servs., Inc., Report of Phase 2 Geotechnical Exploration, Ash Pond Complex, Widows Creek Fossil Plant (Feb. 4, 2010), at app. A, p. 87.

[425] *Id.*

2. Groundwater monitoring at Widows Creek does not provide an accurate account of the likely extent of contamination, but the limited data available suggest significant and ongoing groundwater contamination.

The site-specific DEIS failed to consider the decades of ground and surface water contamination at Widows Creek. Of all the TVA facilities, Widows Creek, with one of TVA's largest ash impoundment complexes, has been monitored the least. TVA's most recent groundwater testing in November 2015 was inadequate and does not indicate whether the ash impoundments are leaching into and contaminating the groundwater around the site. First, TVA no longer monitors the three wells that are down-gradient of the main ash pond. Second, TVA does not test for parameters that would indicate coal ash contamination. Finally, TVA's groundwater monitoring indicates that groundwater around the gypsum stack, which TVA has already closed or is in the process of closing, continues to contaminate the groundwater.

TVA's current groundwater monitoring network at Widows Creek is woefully inadequate. In 1990, a report showed that there were approximately 30 groundwater monitoring wells throughout the site. It appears that there was no groundwater monitoring between 1990 and 2008. In 2011, TVA tested only seven wells, three of which were down-gradient of the main ash pond site (at issue here). The monitoring of those three was discontinued beginning in 2012. The recent groundwater monitoring only monitors four wells, one of which is up-gradient and three of which are located around the gypsum stack. The gypsum stack is located on the opposite side of Widows Creek from the main ash impoundment complex. Any sampling performed since 2011 does not indicate the state of groundwater around the main ash pond.

TVA has failed to provide information of groundwater contamination in the DEIS. Based on TVA's monitoring of the one up-gradient and three down-gradient wells in March and October 2011, TVA's DEIS states that "[g]roundwater concentrations do not exceed the maximum contaminant levels or water quality goals for any parameters analyzed. Overall the trends appear stable or non-detectable, but with limited data available a trend is not apparent."[426]

TVA's 2011 sampling of the three wells down-gradient of the ash impoundment complex indicate that the groundwater is contaminated by coal ash. The groundwater down-gradient of the ash pond complex (wells 10-48, 10-49, and 10-50) had much higher concentrations of coal ash indicators boron, sulfate and manganese than the up-gradient well (well 10). Moreover, these concentrations exceed federal drinking water guidelines by large margins. Even if the groundwater improves by 60% relative to TVA's flawed hypothetical baseline,[427] manganese concentrations will far exceed the EPA lifetime health advisory of 300 µg/L. For example, the manganese concentration for the two samples in 2011 in well 10-49 was 31,000 µg/L. If it were

[426] DEIS Part II (Widows Creek) at 17.

[427] This is apparently EPRI's hypothetical conclusion about closing an ash pond in place when it is contact with groundwater. *See* Att. 18, EPRI Presentation.

reduced by 60%, it would be 12,400 µg/L, still 40 times higher than the lifetime health advisory. In short, closing this pond in place, if it is in contact with groundwater, will render the aquifer off-limits to human use for generations.

In the November 2015 monitoring (which only included the gypsum stack wells), TVA did not test for the coal ash indicators listed above. It also failed to sample any parameters listed in EPA's detection monitoring requirements, regardless of the fact that previous sampling events found high concentrations of some of the detection monitoring parameters.[428] EPA chose these constituents for the detection monitoring program because they are good indicators of coal ash contaminating the groundwater: "In selecting the parameters for detection monitoring, EPA selected constituents that are present in CCRs, and would rapidly move through the subsurface and thus provide an early detection as to whether contaminants were migrating from the disposal unit."[429]

TVA did not test for coal ash indicators in November 2015 even though past sampling showed contamination. For instance, there are high concentrations of sulfate found in well 10-52 for each sampling event from 2011 to 2014. The mean concentration was 1,099 mg/L, which is twice as high as the 500 mg/L limit set by ADEM. Even though there have been high concentrations of sulfate detected for years, it appears from the most recent groundwater monitoring report in November 2015 that TVA is no longer monitoring for sulfate. To ensure that groundwater is not currently being contaminated, and to ensure that TVA analyzes the appropriate information in making its closure decision, TVA must test for the constituents that indicate coal ash contamination.

Based on recent groundwater monitoring data, the gypsum stack, which TVA has closed or is in the process of closing, continues to contaminate the groundwater. This is a major red flag to TVA that closing the ponds in place at Widows Creek Fossil will not stop the ash from leaching into and contaminating the groundwater. TVA tested the groundwater in three down-gradient wells around the gypsum stack in November 2015 and found detectable levels of arsenic, barium, and vanadium. These levels were similar to the levels monitored prior to the gypsum stack beginning the closure process. As stated above, groundwater is a water of the State, and any unpermitted discharge into the groundwater is a violation of the Alabama Water Pollution Control Act.[430] The fact that contamination for a certain constituent is below the MCL or water quality goal is irrelevant.

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[428] 40 C.F.R. pt. 257, app. III. The detection monitoring program requires CCR units to conduct semi-annual monitoring for the following constituents: Boron, Calcium, Chloride, Fluoride, pH, Sulfate, and Total Dissolved Solids.

[429] U.S. EPA, Hazardous and Solid Waste Management System; Identification and Listing of Special Wastes; Disposal of Coal Combustion Residuals from Electric Utilities; Proposed Rule, 75 Fed. Reg. 35,128, 35,206 (June 21, 2010).

[430] Ala. Code §22-22-1(b)(2); Ala. Admin. Code r. 335-6-6.02(fff).

D. The analysis of surface water, wetlands and floodplain impacts is also inadequate.

The DEIS also failed to consider the consequences of leaving the coal ash waste in place on surface waters. TVA's cursory discussion of surface water impacts for Widows Creek Fossil states that "potential direct and indirect impacts of this alternative [closure in place] would be negligible."[431] However, this is based on the hypothetical EPRI study, and fails to consider site-specific issues at Widows Creek.

First, Widows Creek Fossil is located on karst topography, meaning that groundwater flows rapidly, and it flows into both Widows Creek and the Tennessee River. Second, Widows Creek Fossil has had issues with seepage from berms for years. Even once the ponds are dewatered and capped in place, closure in place would only "reduce" the potential lateral movement.[432]

The determination does not consider the current state of surface waters surrounding Widows Creek Fossil, which are severely impaired. Both Widows Creek and Guntersville Reservoir (the Tennessee River where it flows by Widows Creek Fossil) have fish consumption advisories and both are listed on Alabama's § 303(d) list as impaired due to atmospheric mercury deposition.[433] These impairments are most likely due to the burning of coal on site. If ash continues to leach into the groundwater, or water moves laterally through the coal ash, the surface water will continue to be polluted by Widows Creek Fossil's coal ash, further harming the surface waters surrounding the facility.

The DEIS fails to address risks of catastrophic failure based on the instability of the dikes of Ash Impoundment Complex and consequent risk of surface water contamination.[434] It also fails to address impacts to wetlands, despite the fact that the Ash Impoundment Complex is located in or adjacent to wetlands. Moreover, the DEIS fails to identify removal and restoration of the wetland as a mitigation measure for impacts to wetlands.[435]

In addition, for all of the reasons stated in Sections IV.F.3 (Surface Water), IV.F.6 (Wetlands) and IV.F.5 (Floodplains), the analysis of these impacts for the Bottom Ash Pond is inadequate.

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[431] DEIS Part II (Widows Creek) at 22.

[432] *Id.*

[433] *Id.* at 18–20.

[434] Att. 16, RT Report at 7.

[435] *Id*.

VIII. Conclusion

For all of the reasons set forth in these comments, the DEIS is fundamentally flawed. TVA must start over and disclose basic information, such as how each proposed disposal site relates to groundwater and underlying geology, in order to adequately analyze alternatives and impacts at each site. Nothing in the Coal Ash Rule absolves TVA of its responsibilities to comply with NEPA and to protect public health and the environment.