

901 F.3d 414

United States Court of Appeals, District of Columbia Circuit.

UTILITY SOLID WASTE ACTIVITIES GROUP, et al., Petitioners

v.

ENVIRONMENTAL PROTECTION AGENCY, Respondent

[Waterkeeper Alliance](#), et al., Intervenors

No. 15-1219

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Consolidated with 15-1221, 15-1222, 15-1223, 15-1227, 15-1228, 15-1229

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Argued November 20, 2017

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Decided August 21, 2018

Synopsis

Background: Environmental organizations and coal industry organizations petitioned for review of Environmental Protection Agency's (EPA) final rule governing disposal of coal combustion residuals under the Resource Conservation and Recovery Act (RCRA). EPA moved to hold proceedings in abeyance and to remand six specific provisions of rule.

Holdings: The Court of Appeals held that:

court would not hold petitioners' challenge in abeyance;

EPA's determination that existing, unlined surface impoundments of coal residuals could continue to operate until they caused groundwater contamination was arbitrary and capricious;

EPA's treatment of existing surface impoundments of coal residuals that were lined with compacted soil in the same manner as impoundments that were lined with geomembranes was arbitrary and capricious;

EPA's exemption of legacy ponds from same preventative regulation that applied to all other inactive impoundments was arbitrary and capricious;

court would not remand to EPA coal industry petitioners' challenge to EPA's authority to regulate inactive impoundments of coal combustion residuals under RCRA;

court would remand to EPA coal industry petitioners' challenge to final rule with regard to regulation of coal residuals piles, proposed rule's notice of coal residuals piles, and the 12,400-ton threshold for beneficial use and notice thereof; and

provision of RCRA governing EPA's regulation of open dumps, which defines an "open dump" as a facility or site where solid waste is disposed of, permits EPA to regulate inactive sites that are no longer receiving new waste.

Ordered accordingly.

[Karen LeCraft Henderson](#), Circuit Judge, wrote opinion concurring in part and concurring in the judgment in part.

Procedural Posture(s): Review of Administrative Decision; Other.

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Held Invalid

40 C.F.R. §§ 257.50(e), 257.71(a)(1)(i), 257.101(a)(1)

*419 On Petitions for Review of Administrative Action of the United States Environmental Protection Agency

Attorneys and Law Firms

Douglas H. Green and Paul J. Zidlicky argued the causes for Industry petitioners. With them on the joint briefs were John F. Cooney, Margaret K. Kuhn, Samuel B. Boxerman, Eric Murdock, Makram B. Jaber, Joshua R. More, Raghav Murali, Richard G. Stoll, Lori A. Rubin, and Thomas J. Grever. Stephen J. Bonebrake, Brian H. Potts, and Aaron J. Wallisch entered appearances.

Thomas Cmar argued the cause for Environmental petitioners. With him on the briefs were Matthew E. Gerhart, Mary M. Whittle, and Lisa Evans.

Perry M. Rosen, Attorney, U.S. Department of Justice, argued the cause for respondents. With him on the briefs were Jeffrey H. Wood, Acting Assistant Attorney General, Jonathan Skinner-Thompson, Attorney, and Laurel Celeste, Attorney, U.S. Environmental Protection Agency.

Douglas H. Green, John F. Cooney, and Margaret K. Kuhn were on the brief for Industry intervenor-respondents.

Matthew E. Gerhart, Mary M. Whittle, and Lisa Evans were on the brief for Environmental intervenor-respondents.

Before: Henderson, Millett and Pillard, Circuit Judges.

Opinion

Opinion filed Per Curiam.

Per Curiam:

**235 These consolidated petitions challenge the Environmental Protection Agency's 2015 Final Rule governing the disposal of coal combustion residuals (“Coal Residuals”) produced by electric utilities and independent power plants. *See* *420 **236 [Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residuals from Electric Utilities \(“Final Rule”\)](#), 80 Fed. Reg. 21,302 (April 17, 2015). Coal Residuals make up “one of the largest industrial waste streams generated in the U.S.” *Id.* at 21,303. Coal-fired power plants in the United States burned upwards of 800 million tons of coal in 2012 alone and produced approximately 110 million tons of solid waste as Coal Residuals. *Id.* That waste contains myriad carcinogens and neurotoxins. *See* [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, 35,153, 35,168 (June 21, 2010). Power plants generally store it on site in aging piles or pools that are at varying degrees of risk of protracted leakage and catastrophic structural failure. *See* 80 Fed. Reg. 21,327–21,328. The Final Rule sets criteria designed to ensure that human health and the environment face “no reasonable probability” of harm from Coal Residuals spilling, leaking, or seeping from their storage units and harming humans and the environment. *Id.* at 21,338–21,339; 42 U.S.C. § 6944(a).

The statutory framework calling for regulation of solid waste generation, storage, and disposal has been in place since 1976, when Congress enacted the Resource Conservation and Recovery Act (“RCRA”), 42 U.S.C. § 6901 *et seq.*, but regulations implementing RCRA have been long in the making. The EPA has long studied the Coal Residuals disposal problem and struggled over how to address its scale, complexity, and gravity. The agency has been goaded by public outrage over catastrophic failures

at sites storing toxic Coal Residuals, *see* 75 Fed. Reg. at 35,132, 35,137, and was directed by a federal court to devise a schedule to comply with its obligation to regulate under RCRA, *see Appalachian Voices v. McCarthy*, 989 F.Supp.2d 30, 56 (D.D.C. 2013). Nearly four decades after Congress enacted RCRA, the EPA finally promulgated its first Final Rule regulating Coal Residuals in 2015.

These consolidated petitions—one on behalf of environmental organizations (“Environmental Petitioners”) and several others (collectively, “Industry Petition”) for a consortium of power companies and their trade associations (“Industry Petitioners”)—challenge various provisions of that Final Rule under the Administrative Procedure Act and RCRA. RCRA Subtitle D calls on the EPA to promulgate criteria distinguishing “sanitary landfills,” which are permissible under the statute, from “open dumps,” which are prohibited. 42 U.S.C. § 6944(a); *see id.* § 6903(14), (28). The statutory baseline for the EPA’s criteria for sanitary landfills is that, at a minimum, they “shall provide that a facility may be classified as a sanitary landfill and not an open dump only if there is no reasonable probability of adverse effects on health or the environment from disposal of solid waste at such facility.” *Id.* § 6944(a). Each claim here relates to what a utility operating one or more Coal Residuals disposal site(s) must do to qualify such site as a sanitary landfill that may lawfully operate under RCRA.

Shortly before oral argument, the EPA announced its intent to reconsider the Final Rule, and moved to hold all proceedings in abeyance. We asked for clarification on the exact provisions of the Rule that would be subject to reconsideration. The EPA then filed a separate motion to remand six specific provisions.

For the reasons that follow, we deny the EPA’s abeyance motion, and partially grant its remand motion. We also grant in part the Environmental Petition and deny the Industry Petition.

*421 **237 I. Background

A.

“Coal Residuals” is a catch-all term for the byproducts of coal combustion that occurs at power plants. It includes “fly ash,” “bottom ash,” “boiler slag,” and “flue gas desulfurization materials.” *See* 75 Fed. Reg. at 35,137. These residuals vary in their size and texture, but all contain “contaminants of * * * environmental concern.” *Id.* at 35,138. According to the EPA, Coal Residuals contain carcinogens and neurotoxins, including arsenic, boron, cadmium, hexavalent chromium, lead, lithium, mercury, molybdenum, selenium, and thallium. 80 Fed. Reg. at 21,449. The risks to humans associated with exposure to the identified contaminants include elevated probabilities of “cancer in the skin, liver, bladder, and lungs,” as well as non-cancer risks such as “neurological and psychiatric effects,” “cardiovascular effects,” “damage to blood vessels,” and “anemia.” *Id.* at 21,451. Both cancer and non-cancer risks to infants “tend[] to be higher than other childhood cohorts, and also higher than risks to adults.” *Id.* at 21,466. The risks to plant and animal wildlife include “elevated selenium levels in migratory birds, wetland vegetative damage, fish kills, amphibian deformities, * * * [and] plant toxicity.” 75 Fed. Reg. at 35,172.

In developing the Final Rule, the EPA collected data on coal-fired units and their environs, identified hazards for evaluation, and specified benchmarks of toxicity that it determined “generally will be considered to pose a substantial present or potential hazard to human health and the environment and generally will be regulated.” Final Rule, 80 Fed. Reg. at 21,449, 21,451. The EPA analyzed potential pathways of contamination to determine those most likely to pose a reasonable probability of adverse effects on humans or the environment. *Id.* at 21,450–21,451. The EPA concluded that current management practices for Coal Residuals posed risks to human health and the environment at levels justifying uniform national guidelines. *Id.* at 21,303. The main exposure pathways the EPA found were through waste that escapes landfills and surface impoundments and then contaminates groundwater tapped as drinking water, and contaminates surface water that comes in direct contact with fish and other ecological receptors. *Id.*

Under most circumstances, the operators of coal-fired power plants dispose of the waste either by dumping it in dry landfills or by mixing it with water to channel it to wet surface impoundments. 80 Fed. Reg. at 21,303. These disposal sites are massive. On average, landfills span more than 120 acres and are more than 40 feet deep. *Id.* Surface impoundments average more than 50 acres in size with an average depth of 20 feet. *Id.* As of 2012, there were at least 310 landfills and 735 surface impoundments in the United States currently receiving coal ash. *Id.* The EPA identified at least 111 surface impoundments that are no longer receiving coal ash, but are not fully closed. See EPA, Regulatory Impact Analysis: EPA's 2015 RCRA Final Rule Regulating Coal Combustion Residual (CCR) Landfills and Surface Impoundments at Coal-Fired Utility Power Plants, 2–3 (2014), Joint App'x (J.A.) 1096. The record does not specify the number of inactive landfills. See *id.* The Rule also addresses circumstances under which Coal Residuals safely may be “beneficially used”—*e.g.*, to make cement—thereby reducing the total volume that must be managed as waste. See 75 Fed. Reg. at 35,212.

Landfills and surface impoundments both pose threats to human health and the environment. 80 Fed. Reg. at 21,327–21,328. The risks generally stem from the fact *422 **238 that “thousands, if not millions, of tons [of coal ash are] placed in a single concentrated location.” *Id.* These disposal sites are at risk of structural failure, particularly where they are located in unstable areas such as wetlands or seismic impact zones. *Id.* at 21,304. The sheer volume of Coal Residuals at these sites, moreover, can force contaminants into the underlying soil and groundwater, threatening sources of drinking water. *Id.* at 21,304–21,305. Surface water bodies—*i.e.*, rivers, lakes, and streams, see 75 Fed. Reg. at 35,131—are also at risk of contamination through harmful constituents that migrate through groundwater, or flow into surface waters as run-off or wastewater discharge, any of which can lead to environmental harms such as “wetland vegetative damage, fish kills, amphibian deformities, * * * [and] plant toxicity.” See *id.* at 35,172.

Groundwater contamination is more likely to occur at sites that are unlined or lack adequate lining between the coal ash and the soil beneath it. See *id.*; see also Regulatory Impact Analysis, 5–22. However, most existing coal ash disposal sites—70% of landfills and 65% of surface impoundments—have no liner at all. See Regulatory Impact Analysis, 3–4 nn.104–105, J.A. 1108. And while most new landfills and surface impoundments are constructed with liners, see 80 Fed. Reg. at 21,324, not all liners are alike. Composite lining, which includes a plastic geomembrane and several feet of compacted soil to act as a buffer, effectively eliminates the risk of groundwater contamination. See EPA, Human & Ecological Risk Assessment of Coal Combustion Residuals (Risk Assessment), 4–8 to 4–9, J.A. 1110–1111. But many impoundments are lined only with compacted soil and are therefore far less protective. See Regulatory Impact Analysis, 5–22, J.A. 1112. The EPA has acknowledged that it “will not always be possible” to restore groundwater or surface water to background conditions after a contamination event. See Response to Comments 50, J.A. 1301.

Structural failures of surface impoundments pose additional risks that are more episodic but potentially more catastrophic than harm from liner leakage. Impoundment dam ruptures can result in “significant coal slurry releases, causing fish kills and other ecologic damage, and in some instances damage to infrastructure.” 80 Fed. Reg. at 21,457 (footnote omitted). The EPA is aware of at least 50 surface impoundments that are a “high” hazard, see EPA, Coal Combustion Residuals Impoundment Assessment Reports, J.A. 446–469, which the Rule defines to mean that “failure or mis-operation will probably cause loss of human life” in addition to other harms, 40 C.F.R. § 257.53. The EPA has tagged another 250 impoundments as posing a “significant” hazard, see Impoundment Assessment Reports, J.A. 446–469, where failure or mis-operation is unlikely to kill people, but would “probably cause economic loss, environmental damage, or disruption of lifeline facilities, or impact other concerns.” 40 C.F.R. § 257.53. Structural risk is exacerbated at sites located in geologically unstable areas, such as those with poor foundation conditions, areas susceptible to earthquakes or other mass movements, or those with karst terrains. See *id.*; 80 Fed. Reg. at 21,365–21,367.

Risks from inactive surface impoundments at inactive power plants, which the parties refer to as “legacy ponds,” are also apparent in the record. As with surface impoundments at active plants, groundwater contamination or catastrophic structural failure of a legacy pond threatens human health and the environment. But legacy ponds, which by their nature are older than most surface impoundments, are “generally unlined” and *423 **239 unmonitored, and so are shown to be more likely to leak than units at utilities still in operation. 80 Fed. Reg. at 21,343–21,344. Without an on-site operator to monitor and maintain

such a unit, consequences of leakage or structural failure may be amplified. *Cf. id.* at 21,394 (requiring qualified personnel to conduct weekly inspections at active surface impoundments).

The EPA record reports on the many cases in which damage has already occurred. “EPA has confirmed a total of 157 cases * * * in which [Coal Residual] mismanagement has caused damage to human health and the environment.” 80 Fed. Reg. at 21,325. The EPA recounts that public pressure to regulate Coal Residuals escalated after an unlined surface impoundment in Kingston, Tennessee suffered a “catastrophic” structural failure on December 22, 2008. *See* 75 Fed. Reg. at 35,132. The impoundment released approximately 5.4 million cubic yards of Coal Residual sludge across 300 acres of land and into the nearby Emory River. *See* EPA, Damage Case Compendium: Technical Support Document, Volume I: Proven Damage Cases, 143 (2014), J.A. 1192. According to the EPA, the spill was one of the “largest volume industrial spill[s] in U.S. history.” *Id.* at 143 n.612, J.A. 1192. The Coal Residual sludge ruptured a natural gas line, disrupted power in the area, damaged or destroyed dozens of homes, and resulted in elevated levels of arsenic and lead in the Emory River. *Id.* The resulting river contamination “completely destroyed” more than 80 acres of aquatic ecosystems. *Id.* at 144, J.A. 1193. More than a year after the spill, the majority of fish collected from the river contained toxins that rendered them unsafe for human consumption. *Id.* The disaster forced the closure of the Emory River for almost two years. The Tennessee Valley Authority took four years and spent more than \$1.2 billion to remove Coal Residuals and contaminated sediment from the river and adjoining areas, to monitor and repair associated damage, and to construct a new disposal unit. *Id.* at 148, J.A. 1197.

B.

Two years after the Kingston disaster, the EPA promulgated the Proposed Rule announcing its intent to regulate Coal Residuals under RCRA. *See* 75 Fed. Reg. at 35,128.¹

¹ On several previous occasions, the EPA considered, but decided against, regulating Coal Residuals under RCRA Subtitle C. For background on the EPA's previous determinations on Coal Residuals, *see* 75 Fed. Reg. at 35,136–35,137.

A key question for the EPA had long been whether to regulate Coal Residuals as hazardous waste under the cradle-to-grave federal hazardous waste management authority conferred by RCRA Subtitle C, 42 U.S.C. §§ 6921–6939g, or to treat it as nonhazardous solid waste subject to national guidelines under Subtitle D, *id.* §§ 6941–6949a. A waste is “hazardous” and subject to regulation under Subtitle C only if it exhibits one of four hazard characteristics: ignitability, corrosivity, reactivity, or toxicity. *See id.* § 6921; 40 C.F.R. §§ 261.11, 261.20–261.24. Under Subtitle C, the EPA directly regulates all stages of production and disposition of hazardous wastes, and has administrative enforcement power as well as authority to initiate or recommend civil and criminal actions in court. *See* 42 U.S.C. §§ 6922–6928. Subtitle D, in contrast, envisions that states are primarily responsible for regulating disposal of nonhazardous wastes in landfills and dumps. The EPA's principal role under Subtitle D is to announce federal guidelines for state management of nonhazardous wastes; Subtitle D leaves it up *424 **240 to the states to “use federal financial and technical assistance to develop solid waste management plans in accordance with [the] federal guidelines.” *Environmental Def. Fund v. EPA*, 852 F.2d 1309, 1310 (D.C. Cir. 1988).

Substantively, Subtitle D prohibits the disposal of solid waste in “open dumps,” 42 U.S.C. § 6945(a), and calls on the EPA to promulgate criteria for determining whether a waste facility constitutes an open dump—criteria that, if followed, will ensure “no reasonable probability of adverse effects on health or the environment from disposal of solid waste at such facility,” *id.* § 6944(a). Subtitle D neither grants the EPA direct enforcement authority nor requires states to adopt or implement its requirements. *See id.* § 6941. Enforcement is left to states’ own policy decisions and to the initiative of people bringing citizen suits to enforce the federal standards. *See id.* §§ 6946–6947, 6972. *But see infra* Part II.A. (discussing recent amendments to RCRA).

The EPA initially published two alternative proposed rules to govern Coal Residuals, one under each Subtitle, basing the Subtitle C proposal on the toxicity of Coal Residuals. *See* 75 Fed. Reg. at 35,146. The proposals drew 450,000 public comments, the vast bulk of which spoke to the threshold question of which RCRA Subtitle to use, and the majority of which supported regulation

under Subtitle C. 80 Fed. Reg. at 21,319. Most of the commenters were individuals and environmental groups pressing for stronger regulation “because state programs have failed to adequately regulate the disposal of [Coal Residuals] and because the risks associated with the management of these wastes are significant.” *Id.* Only a handful of states, for example, required any groundwater monitoring around units holding Coal Residuals, *id.* at 21,323–21,324, including only one of the eight states with the biggest volumes of Coal Residuals, Regulatory Impact Analysis, G-6, J.A. 1121. On the other hand, the enormous volume of waste permeated with relatively low concentrations of toxins posed practical difficulties for any Subtitle C regulation. *See* 80 Fed. Reg. at 21,321.

Based on many years of analysis, the EPA found “a compelling need for a uniform system of requirements to address the [] risks [from Coal Residuals],” and decided to move forward with a Final Rule. 80 Fed. Reg. at 21,327. The EPA opted to proceed under the less muscular Subtitle D even as it continued to study factors potentially supporting regulating Coal Residuals as hazardous waste under RCRA Subtitle C. *See id.* at 21,319–21,327. The EPA thus formally deferred deciding whether Subtitle C regulation is warranted, and used its Subtitle D authority to set forth guidelines on where and how disposal sites for Coal Residuals are to be built, maintained, and monitored. *See* 80 Fed. Reg. at 21,302.

The Final Rule sets minimum criteria for the disposal of Coal Residuals in landfills and surface impoundments. Among the provisions of the Final Rule at issue here are location restrictions on landfills and surface impoundments, requirements pertaining to lining, structural integrity, and groundwater monitoring, and criteria for recycling Coal Residuals for beneficial uses, such as substituting for cement in road construction, in lieu of keeping it in disposal units. *See* 40 C.F.R. §§ 257.60–257.74. The Final Rule also sets compliance deadlines, procedures for closing non-complying landfills and surface impoundments, and requirements that operators of these disposal sites make records of their compliance with the Final Rule publicly available. *See id.* §§ 257.100–257.07. We discuss the relevant criteria in more detail *425 **241 in addressing the merits of the consolidated petitions.

C.

Two groups of petitioners sought review of the Final Rule. Environmental Petitioners are an assortment of environmental groups that includes the Environmental Integrity Project, Sierra Club, and Hoosier Environmental Council. They generally claim that EPA did not go far enough to protect the public and the environment from the harms of Coal Residual disposal. Specifically, they claim that the Final Rule unlawfully countenances significant risks of harmful leakage by allowing unlined impoundments as well as impoundments lined only with a layer of compacted soil to continue receiving Coal Residuals. Environmental Petitioners also contend that the EPA acted arbitrarily and capriciously by exempting from regulation so-called “legacy ponds”—inactive surface impoundments at shuttered power plants—given evidence that legacy ponds are at risk of unmonitored leaks and catastrophic structural failures. They also make a claim, not raised during rulemaking, that the EPA violated RCRA's citizen-suit provision by failing to require the operators of Coal Residual disposal sites to timely and publicly disclose records reflecting their compliance with the Final Rule.

Industry Petitioners are a collection of industry trade associations and utilities including the Utility Solid Waste Activities Group, AES Puerto Rico, LP, the Edison Electric Institute, the National Rural Electric Cooperative Association, and the American Public Power Association. They first assert that the EPA exceeded its statutory authority under RCRA to set guidelines for facilities where waste “is disposed of,” 42 U.S.C. § 6903(14), by regulating surface impoundments that no longer actively receive Coal Residuals. They further claim that the Rule's restriction on placement of new units and expansions of existing units near aquifers, 40 C.F.R. § 257.60 (aquifer location restriction), was inadequately noticed, and that the Rule's provision for nonconforming units to continue in operation if no alternative disposal capacity is available, *id.* § 257.103 (alternative closure provision), arbitrarily and capriciously excludes cost considerations from its definition of “available.” Industry Petitioners also challenge the Rule's location restrictions and structural integrity criteria governing units in seismic impact zones. *See id.* §§ 257.63, 257.73–257.74. They contend that the deadline for existing impoundments' compliance with those provisions was

arbitrarily shortened from the timeframe in the Proposed Rule, that the Rule arbitrarily applied the location restrictions to new but not existing landfills, and that EPA failed to explain the strict design criteria it adopted for new landfills and impoundments.

Environmental Petitioners intervened in Industry's petition for review, and vice versa. We consolidated the petitions. The case has been pending in this court since 2015, but several procedural matters delayed resolution until now. In June 2016, we granted the EPA's unopposed motion to remand to itself several provisions of the Final Rule not at issue here that the EPA had decided to vacate. *See* Per Curiam Order, *Utility Solid Waste Activities Grp. v. EPA*, No. 15-1219 (D.C. Cir. June 14, 2016). In doing so, we held all proceedings in abeyance while the EPA revised portions of the Rule affected by the vacatur. *See id.* We then set oral argument for October 17, 2017.

Less than a month before oral argument, the EPA announced that it had granted the petition of several industry groups to reconsider the Final Rule, and moved us to hold all proceedings in abeyance. *426 **242 The EPA pointed to Congress's recent enactment of the Water Infrastructure Improvements for the Nation Act (“WIIN Act”), Pub. L. No. 114-322, 130 Stat. 1628 (2016) (codified at 42 U.S.C. § 6945(d)), in December 2016 that, among other things, amended RCRA Subtitle D to allow the EPA to approve State permitting programs “to operate in lieu of [EPA] regulation of coal combustion residuals units in the State,” provided those programs are at least as environmentally protective as the existing (or successor) EPA regulations. 42 U.S.C. § 6945(d)(1)(A). When we asked EPA to specify which provisions it planned to reconsider, the EPA filed another motion. That motion sought to remand provisions of the Rule relating to the beneficial use of Coal Residuals, alternative compliance provisions, legacy ponds, and the EPA's statutory authority to regulate inactive surface impoundments. We deferred a ruling on both motions until now.

On July 30, 2018, the EPA promulgated an amendment to the Final Rule (i) allowing a state or the EPA, when acting as a permitting authority, to use alternate groundwater performance standards, (ii) revising the groundwater performance standards for certain constituents, and (iii) extending the timeframe for facilities to cease receiving Coal Residuals once they are required to close. *See Hazardous and Solid Waste Management System: Disposal of Coal Combustion Residuals from Electric Utilities; Amendments to the National Minimum Criteria*, 83 Fed. Reg. 36,435, 36,436 (July 30, 2018).

II. Request for Abeyance

A. WIIN Act

At the outset, the EPA requests that this case be held in abeyance while it considers potential regulatory changes in response to Congress's enactment of the WIIN Act, 42 U.S.C. § 6945(d). The WIIN Act amended RCRA's Subtitle D State permitting scheme. As relevant here, Section 6945(d) provides that the Administrator may approve qualified State “permit program[s] or other system[s] of prior approval and conditions under State law for regulation by the State of coal combustion residuals units” to “operate in lieu of [EPA] regulation of coal combustion residuals units in the State * * *.” 42 U.S.C. § 6945(d)(1)(A).

But the Administrator may only approve a state plan if its standards “are at least as protective as the criteria” set by the EPA in its corresponding RCRA regulations, specifically including Coal Residuals regulation, 40 C.F.R. pt. 257. 42 U.S.C. § 6945(d)(1)(C); *see id.* § 6945(d)(1)(B)(i). The WIIN Act also provides that a Coal Residuals disposal site can only qualify as a “sanitary landfill” if it is in full compliance with, among other things, the EPA's extant (or successor) regulations governing Coal Residuals waste sites. 42 U.S.C. § 6945(d)(6).

The EPA argues that the WIIN Act has afforded it new regulatory options and makes “fundamental changes to RCRA Subtitle D as applied specifically to [Coal Residuals].” EPA WIIN Br. 4, 6, 8. On that basis, the EPA asks us to hold the case in abeyance while it decides whether or not “to alter some of its regulatory choices[.]” EPA WIIN Br. at 2, 6.

We decline to exercise our discretion to hold the case in abeyance. We leave it open for the EPA to address on remand the relevance of the WIIN Act, the Act's express incorporation of the EPA regulations published at 40 C.F.R. Part 257, and its definition of “sanitary landfill.”

III. Environmental Petitioners' Challenges

A. Unlined Surface Impoundments

Environmental Petitioners challenge the Final Rule's provision that existing, *427 **243 unlined surface impoundments may continue to operate until they cause groundwater contamination. 40 C.F.R. § 257.101(a)(1). They contend that the EPA failed to show how continued operation of unlined impoundments meets RCRA's baseline requirement that any solid waste disposal site pose “no reasonable probability of adverse effects on health or the environment.” 42 U.S.C. § 6944(a).

The EPA found that unlined impoundments are dangerous: It concluded that, among the studied disposal methods, putting Coal Residuals “in unlined surface impoundments and landfills presents the greatest risks to human health and the environment.” 80 Fed. Reg. at 21,451. The Rule accordingly requires that all new surface impoundments be constructed with composite lining that effectively secures against leakage. See 40 C.F.R. § 257.72(a). But it allows existing unlined impoundments to continue to receive Coal Residuals indefinitely, until their operators detect that they are leaking. *Id.* § 257.101(a). Only once a leak is found must the operator of an unlined impoundment begin either retrofitting the unit with a composite liner, or closing it down—a process that the Rule contemplates may take upwards of fifteen years. *Id.* § 257.102(f). In view of the record evidence that led the EPA to conclude that composite liners are needed to ensure that new impoundments meet RCRA Subtitle D's “no reasonable probability” standard, Environmental Petitioners claim that the Rule's allowance for continued operation of existing, unlined surface impoundments is arbitrary and capricious and contrary to RCRA.

The EPA and Industry Intervenors assert that the composite lining required for new units is not needed for existing units because most unlined impoundments do not leak, and an unlined impoundment that is not leaking is not dangerous. Industry Intervenors emphasize that the record suggests that “almost two-thirds of unlined impoundments *do not* leak,” and they assert that “appropriate controls on impoundments that do leak” suffice to meet RCRA's “no reasonable probability” standard. Industry Intervenor Br. 6–7. The EPA underscores that it made no finding of any “reasonable probability that *each and every* unlined impoundment will, in fact, result in adverse effects on health and the environment.” Resp't Br. 82. It insists that RCRA's “no reasonable probability” standard is met by the Rule's provisions for “extensive monitoring of groundwater to detect constituent leaking,” *id.* at 83, and “immediate action to stop that leak,” “redress that leak,” and to close the site as soon as a harmful leak is detected. Oral Arg. Tr. 100:20–100:25.

The record shows, however, that the vast majority of existing impoundments are unlined, see Regulatory Impact Analysis 3-4, J.A. 1108, that unlined impoundments have a 36.2 to 57 per cent chance of leakage at a harmfully contaminating level during their foreseeable use, see *id.* at 4-9, 5-22, J.A. 1111–1112, and that the threat of contamination from unlined units exceeds the EPA's cancer risk criteria and thus “generally will be considered to pose a substantial present or potential hazard to human health and the environment,” 80 Fed. Reg. at 21,449–21,450; see Risk Assessment 5-5, J.A. 1041. It is inadequate under RCRA for the EPA to conclude that a major category of impoundments that the agency's own data show are prone to leak pose “no reasonable probability of adverse effects on health or the environment,” 42 U.S.C. § 6944(a), simply because they do not already leak.

The number of unlined impoundments is large. The EPA identified 735 existing active surface impoundments throughout the country. Of the 504 sites for which the *428 **244 EPA was able to collect liner data, approximately 65 per cent were completely unlined, with most of the rest lined only with compacted soil or other partial or high-permeability liners. See Regulatory Impact Analysis 3-4 n.105, J.A. 1108. Only 17 per cent of surface impoundments for which the EPA has liner data had composite liners—the sole liner type that the EPA found to be effective in reducing the risk of toxic chemical leakage to the level that the Agency found acceptable.

Those hundreds of unlined impoundments are at significant risk of harmful leakage. Of 157 sites where the EPA confirmed that Coal Residuals have already caused damage to human health and the environment, the damage cases “were primarily associated with unlined units.” 80 Fed. Reg. at 21,452. The record evidence shows that an impoundment with composite lining, which the Rule requires of all new impoundments, has a 0.1 per cent chance of contaminating groundwater at drinking-water wells a mile distant from the impoundment perimeter over the course of a 100-year period. Regulatory Impact Analysis 5-22, J.A. 1112. An unlined impoundment, in contrast, has a 36.2 per cent chance of contaminating groundwater at such a distance. See *id.* And the probability of contamination is higher at distances closer to the impoundment site, *id.*, J.A. 1112; measured one meter from the impoundment's perimeter, the contamination risk jumps to 57 per cent, *id.*, J.A. 1111. See Risk Assessment ES-4, J.A. 1083–1084 (“In many of the potential damages cases, groundwater exceedances were discovered near the boundary” of the impoundment). According to the administrative record, then, a significant portion of the 575 identified unlined surface impoundments are likely to contaminate groundwater.

Impoundment leakages pose substantial risks to humans and the environment. The EPA studied a wide range of toxins present in Coal Residuals, see Risk Assessment ES-4, J.A. 1010, and considered various forms of potential human and environmental exposures. The EPA uses risk benchmarks in assessing the propriety of regulatory action. For example, it treats a cancer risk in excess of 1×10^4 , or 1 in 10,000, as one that “generally will be considered to pose a substantial present or potential hazard to human health and the environment[.]” 80 Fed. Reg. at 21,449. For non-cancer risks, the EPA determined that a Hazard Quotient—defined as the “ratio of the estimated exposure to the exposure at which it is likely that there would be no adverse health effects,” 75 Fed. Reg. at 35,168—gives rise to such a threat when it is greater than or equal to 1. See 80 Fed. Reg. at 21,449. Using those benchmarks and the data it collected from the Risk Assessment, the EPA found that material human exposures derive from ingestion of contaminated groundwater or the consumption of contaminated fish. *Id.* at 21,450–21,451.² The plant and animal exposures the EPA identified as material derive from contact with contaminated surface water. See *id.*; Risk Assessment 5-8, J.A. 1044. The EPA also expressed concern about the contamination of groundwater that is not currently used as a source of drinking water because “[s]ources of drinking water are finite, and future users’ interests must also be protected.” 80 Fed. Reg. at 21,452. In view of the record's limitation of the risk calculus associated with leakage to the *429 **245 subset of toxins and exposures that the EPA deemed to present a substantial risk to human health or the environment, the EPA's assertion in its brief that, even where it occurs, leakage “will not necessarily result in contamination of groundwater, either above allowable regulatory thresholds, or at all,” is at best a red herring. Resp't Br. at 85. Every leakage the EPA record treated as material exceeded regulatory thresholds. In defending the Rule here, the EPA looks at too narrow a subset of risk information and applies the wrong legal test.

² The EPA's Risk Assessment found that unlined impoundments created an unacceptable human cancer risk as a result of exposure to two different arsenics, and an unacceptable non-cancer risk as a result of exposure to one type of arsenic, as well as lithium, molybdenum, and thallium. See Risk Assessment 5-5, J.A. 1041.

The Final Rule's approach of relying on leak detection followed by closure is arbitrary and contrary to RCRA. This approach does not address the identified health and environmental harms documented in the record, as RCRA requires. Moreover, the EPA has not shown that harmful leaks will be promptly detected; that, once detected, they will be promptly stopped; or that contamination, once it occurs, can be remedied.

On its own terms, the Rule does not contemplate that contamination will be detected as soon as it appears in groundwater. The EPA and Industry defend the rule as RCRA-compliant principally because, they say, it provides for retrofit with a composite liner or closure of an unlined impoundment “[o]n the *first* indication that an unlined unit is leaking[.]” Industry Intervenor Br. 6. But the required groundwater sampling need only occur “at least semiannual[ly],” or perhaps less frequently under certain geological conditions. 40 C.F.R. § 257.94(b), (d); *id.* § 257.95(c). The Rule thus contemplates that leaks will often go undetected for many months.

By the time groundwater contamination from an unlined impoundment has been detected, more damage will have been done than had the impoundment been lined: Leakage from unlined impoundments is typically quicker, more pervasive, and at larger volumes than from lined impoundments. *See* 80 Fed. Reg. at 21,406. Unlike lined impoundments, in which leaks are “usually caused by some localized or specific defect in the liner system that can more readily be identified and corrected,” leakage from unlined impoundments is more pervasive and less amenable to any quick, localized fix. *Id.* at 21,371. When an unlined impoundment begins to leak, Coal Residual sludge “will flow through the unit and into the environment unrestrained,” such that retrofit or closure of the unit are typically “the only corrective action strateg[ies] that [the] EPA can determine will be effective[.]” *See id.*

Neither retrofitting nor closure occurs immediately under the Rule; the timeline contemplates a process that takes from five to fifteen years. *See* 40 C.F.R. § 257.102. The EPA understates the harm its own record evidences by emphasizing that “leaking unlined impoundments must cease receiving [Coal Residuals] and initiate closure or retrofit activities within six months.” Resp’t Br. at 81; *see* 40 C.F.R. § 257.101(a)(1). What it neglects to account for is that the Rule gives the operator a further five years to complete retrofitting or closure activities. *Id.* §§ 257.102(f)(1)(ii), 257.102(k)(3). The Rule also allows the operators of surface impoundments to extend that window, by up to two years for smaller units and, for units larger than 40 acres—which most are, *see* 80 Fed. Reg. at 21,303—for up to ten years, *see* 40 C.F.R. § 257.102(f)(2)(ii).

The Rule addresses neither the risks to public health and to the environment before leakage is detected, nor the harms from continued leakage during the years before leakage is ultimately halted by retrofit or closure. *See generally* 40 C.F.R. §§ 257.90–257.104. In defending *430 **246 the Rule as compliant with RCRA, the EPA did not even consider harms during the retrofit or closure process. *See* Resp’t Br. 80–86; 80 Fed. Reg. at 21,403–21,406; *cf.* Oral Arg. Tr. 102–105 (EPA counsel unable to identify record evidence regarding how quickly leaks can be detected or how quickly and thoroughly responsive action can occur, but referring generally to a practice of immediate “pump and treat,” which the Rule does not appear to require). An agency’s failure to consider an important aspect of the problem is one of the hallmarks of arbitrary and capricious reasoning. *See United States Sugar Corp. v. EPA*, 830 F.3d 579, 606 (D.C. Cir. 2016) (per curiam) (citing *Motor Vehicle Mfrs. Ass’n v. State Farm Mut. Auto. Ins. Co.*, 463 U.S. 29, 43, 103 S.Ct. 2856, 77 L.Ed.2d 443 (1983)).

The EPA’s position suffers additional flaws. The EPA determined that contaminated surface waters, such as rivers, streams, and lakes, are the principal pathway of harm to environmental receptors, but the Final Rule requires only monitoring of groundwater, and only for levels of contamination that would harm human health. *See* 40 C.F.R. §§ 257.90–257.95 (calling for groundwater monitoring systems); 75 Fed. Reg. at 35,130 (defining maximum contaminant level in terms of drinking water safety). Surface water contamination poses environmental risks from “[e]levated selenium levels in migratory birds, wetland vegetative damage, fish kills, amphibian deformities, * * * [and] plant toxicity,” 75 Fed. Reg. at 35,172, and to humans through the possible consumption of contaminated fish, 80 Fed. Reg. at 21,444. These risks exceed the EPA’s risk criteria for ecological receptors. *See* Risk Assessment 5–8, J.A. 1044. And some contamination levels that do not meet the risk threshold for humans may exceed thresholds for ecological receptors. *See, e.g., id.* (noting a risk exceedance unique to ecological receptors from cadmium). Yet the record does not explain how the Rule’s provisions for groundwater monitoring, followed by corrective action only when human exposure benchmarks are exceeded, will mitigate these risks. RCRA requires the EPA to set minimum criteria for sanitary landfills that prevent harm to either “health or the environment.” 42 U.S.C. § 6944(a) (emphasis added). The EPA’s criteria for unlined surface impoundments, limited as they are to groundwater monitoring for contaminant levels keyed to human health, only partially address the first half of the statutory requirement.

For these reasons, we vacate 40 C.F.R. § 257.101, which allows for the continued operation of unlined impoundments, and remand for additional consideration consistent with this opinion.

B. Liner Type Criteria

Environmental Petitioners next challenge the Final Rule's regulation of so-called "clay-lined" surface impoundments. A clay liner consists of at least two feet of compacted soil to act as a buffer between the Coal Residual sludge and the local soil. *See* Risk Assessment 4-8; J.A. 1024. Even as the Rule requires all newly constructed surface impoundments to be built with composite lining, disapproving any new impoundments lined only with compacted soil, it treats existing impoundments constructed with the same compacted soil and no geomembrane as if they were "lined." *See* 40 C.F.R. §§ 257.71(a)(1)(i), 257.96–257.98. The upshot is that such clay-lined impoundments may stay open and keep accepting Coal Residuals, subject to groundwater monitoring for leakage, *see* 40 C.F.R. § 257.101, but, unlike existing unlined impoundments—which must begin closure when they leak, *id.* § 257.71(a)(1)—clay-lined impoundments need not begin closure when they are discovered *431 **247 to be leaking. Rather, their operators may attempt to repair them first. *Id.* §§ 257.96–257.98. Only if repair is unsuccessful must they then begin the protracted process to either retrofit with a composite liner or close.

The EPA contends that, by requiring the operators of clay-lined impoundments to fix leaks when they occur, the Rule comports with RCRA's mandate to ensure "no reasonable probability of adverse effects on health or the environment." 42 U.S.C. § 6944(a); *see* Resp't Br. 88–89. For their part, Environmental Petitioners point to record evidence that clay-lined units are likely to leak, and contend that the EPA's approach "authorizes an endless cycle of spills and clean-ups" in violation of RCRA. *See* Envtl. Pet'r Br. 30.

Clay-lined units are dangerous: "clay-lined units tended to have lower risks than unlined units" but, the record evidence showed, they were "still above the criteria" that the EPA set as the threshold level requiring regulation. 75 Fed. Reg. at 35,144. Clay-lined surface impoundments have a 9.1 per cent chance of causing groundwater contamination at drinking water wells at a one-mile distance from the impoundment perimeter. *See* Regulatory Impact Analysis 5-22, J.A. 1112. And, as with unlined impoundments, the EPA acknowledges that the risk of contamination from leaking clay-lined impoundments is much higher closer to the impoundment perimeter. *See* Risk Assessment 5-39 to 5-40, J.A. 1075–1076 ("[A]rsenic concentrations fall dramatically as the distance from the [waste management units] increases."); *id.* at 5-47 to 5-48, J.A. 1083–1084 ("In many of the potential damage cases, ground water exceedances were discovered near the boundary of the W[aste] M[anagement] U[nit].").³ Leaks from clay-lined units, the EPA found, present cancer and non-cancer risks that exceed the EPA's risk criteria. *See* Risk Assessment 5-5, 5-30, J.A. 1041, 1066.

³ The administrative record does not show the exact probability of contamination from clay-lined units at a one-meter distance. *See* Regulatory Impact Analysis, 4-9 to 5-22, J.A. 1111–1112.

The EPA's regulation of clay-lined impoundments suffers from the same lack of support as its regulation of unlined impoundments. *See supra* part III.A. Just as the EPA did not explain how the Rule's contemplated detection and response could assure "no reasonable probability of adverse effects to health or the environment" at unlined impoundments, it likewise failed regarding existing impoundments lined with nothing more than compacted soil. The EPA insists that the Rule's criteria ensure that leaks from these clay-lined units will be "promptly" addressed, thereby satisfying RCRA. Resp't Br. 91.

But here, too, the EPA has failed to show how unstaunched leakage while a response is pending comports with the "no reasonable probability" standard. The problem is compounded by the Rule's unsupported supposition that leaking clay liners, unlike leaking unlined impoundments, can be repaired. The Rule thus allows an operator of a leaking clay-lined impoundment time to explore repair even before the five-to-fifteen year retrofit-or-close clock starts to run. For starters, the Rule allows operators of lined impoundments up to five months to complete an assessment of possible corrective measures, 40 C.F.R. § 257.96(a), and—given the numerous, complicated steps involved in doing so—allows an additional, indefinite amount of time to actually select a remedy. *See id.* § 257.97; 80 Fed. Reg. at 21,407–21,408. Once an operator settles on a remedy, it has another three months to initiate remedial *432 **248 activities. *Id.* at § 257.98(a). If it turns out that no effective repair is feasible, or if an attempted repair proves unsuccessful, only then does the Rule contemplate the impoundment's operator will begin the protracted process—discussed above in connection with the closure of existing, unlined impoundments—of retrofitting the site with a composite liner or closing it. There is no evidence in the record supporting the EPA's assumption that clay liners are reasonably susceptible

of repair, nor any explanation or account of how the risks of harm during the lengthy response periods the Rule allows comport with the “no reasonable probability” standard.

Just as with the EPA's regulation of unlined impoundments, the Rule's treatment of clay-lined impoundments does not capture the full range of health and environmental harms they pose, as RCRA requires. By responding only to risks from leakage contaminating groundwater a mile from the perimeter of the studied impoundments, and accordingly setting minimum criteria that focus solely on harms to humans through drinking water contamination, the EPA has failed to ensure “no reasonable probability” of adverse effects to the environment, as RCRA requires. 42 U.S.C. § 6944(a).

For these reasons, we vacate the Rule insofar as it treats “clay-lined” units as if they were lined. See 40 C.F.R. § 257.71(a)(1)(i).

C. Legacy Ponds

The EPA exempted inactive impoundments at *inactive* facilities, which are commonly referred to as “legacy ponds,” from the same preventative regulation applied to all other inactive impoundments under the Rule. 40 C.F.R. § 257.50(e). The EPA considered it sufficient instead just (i) to wait to intervene until a substantial environmental or human harm is “imminent,” 42 U.S.C. § 6973, or (ii) to attempt to remediate the damage after contamination has occurred. 80 Fed. Reg. at 21,311 n.1; *id.* at 21,312 n.2. Environmental Petitioners argue that, because legacy ponds pose at least the same risks of adverse effects as all other inactive impoundments, the EPA failed to articulate a rational explanation for their dissimilar treatment.

The EPA does not dispute the dangers posed by the unregulated legacy ponds, but asserts that the difficulties in identifying the party responsible for legacy ponds justify its reactive approach. Because the EPA's own record plainly contravenes that rationale, and the Rule pays scant attention to the substantial risk of harm to human health and the environment posed by legacy ponds, we reject the legacy pond exemption as arbitrary and capricious.

1.

Legacy ponds are a particular subset of inactive impoundments. Like all inactive impoundments, they contain a toxic “slurry” of Coal Residuals mixed with water, but legacy ponds are not receiving new deposits. 80 Fed. Reg. at 21,457 n.219. What distinguishes legacy ponds from other inactive impoundments, then, is their location. Legacy ponds are found at power plants that are no longer engaged in energy production. In other words, legacy ponds are inactive impoundments at inactive facilities.

As a result, legacy ponds present a unique confluence of risks: They pose the same substantial threats to human health and the environment as the riskiest Coal Residuals disposal methods, compounded by diminished preventative and remediation oversight due to the absence of an onsite owner and daily monitoring. See 80 Fed. Reg. at 21,343–21,344 (finding that the greatest disposal risks are “primarily *433 **249 driven by the older existing units, which are generally unlined”). Notably, this very Rule was prompted by a catastrophic legacy pond failure that resulted in a “massive” spill of 39,000 tons of coal ash and 27 million gallons of wastewater into North Carolina's Dan River. *Id.* at 21,394; *id.* at 21,393.

Nevertheless, the EPA chose to leave legacy ponds on the regulatory sidelines. 40 C.F.R. § 257.50(e). Unlike all the other inactive impoundments, EPA adopted a largely hands-off approach, choosing (i) to respond only after “imminent” leakage is detected and reported, 42 U.S.C. § 6973(a) (RCRA's “imminent and substantial endangerment” provision), or to (ii) attempt an after-the-spill clean up under the Comprehensive Environmental Response, Compensation, and Liability Act (commonly known as the “Superfund” statute), 42 U.S.C. § 9601 *et seq.* See 80 Fed. Reg. at 21,312 n.2 (citing 42 U.S.C. § 9608(b)).

The EPA's rationale for allowing legacy ponds, in effect, one free leak was its supposed inability to identify the owners of legacy ponds. In the absence of an identified owner or other responsible party, the EPA reasoned, enforcing the Coal Residuals regime

would be difficult with no operator onsite to generate compliance certifications, conduct inspections, or otherwise implement the Rule's substantive requirements. *See* 80 Fed. Reg. at 21,344.

The EPA's decision was arbitrary and capricious. To begin with, there is no gainsaying the dangers that unregulated legacy ponds present. The EPA itself acknowledges the vital importance of regulating inactive impoundments at active facilities. That is because, if not properly closed, those impoundments will “significant[ly]” threaten “human health and the environment through catastrophic failure” for many years to come. 75 Fed. Reg. at 35,177; *see also* 80 Fed. Reg. at 21,344 n.40.

The risks posed by legacy ponds are at least as substantial as inactive impoundments at active facilities. *See* 80 Fed. Reg. at 21,342–21,344 (finding “no[] measurabl[e] differen[ce]” in risk of catastrophic events between active and inactive impoundments). And the threat is very real. Legacy ponds caused multiple human-health and environmental disasters in the years leading up to the Rule's promulgation. *See* 75 Fed. Reg. at 35,147 (proposed rule discusses multiple serious incidents). For example, a pipe break at a legacy pond at the Widows Creek plant in Alabama caused 6.1 million gallons of toxic slurry to deluge local waterways. *Id.* Another legacy pond in Gambrills, Maryland caused the heavy metal contamination of local drinking water. *Id.* And the preamble to the Rule itself specifically points to the catastrophic spill at the Dan River legacy pond in North Carolina. 80 Fed. Reg. at 21,393–21,394. Simply hoping that somehow there will be last-minute warnings about imminent dangers at sites that are not monitored, or relying on cleaning up the spills after great damage is done and the harm inflicted does not sensibly address those dangers. Certainly it does not fulfill the EPA's statutory duty to ensure “no reasonable probability of adverse effects” to environmental and human well-being. 42 U.S.C. § 6944(a).

Confronted by those considerable dangers, the EPA's decision to shrug off preventative regulation makes no sense. The asserted difficulty in locating the owners or operators responsible for legacy ponds does not hold water. The record shows that the EPA knows where existing legacy ponds are and, with that and other information, the EPA already is aware of or can feasibly identify the responsible parties. After all, the owners and operators of the Dan River, Widows Creek, and Gambrills, Maryland disasters were all known. *434 **250 *See* 80 Fed. Reg. at 21,393–21,394; 75 Fed. Reg. at 35,147.

Also, the EPA has been compiling and maintaining a database for nearly a decade that identifies legacy ponds and their owners with specificity. *See* Regulatory Impact Analysis for EPA's Proposed RCRA Regulation of Coal Combustion Residues, *Information Request Responses from Electric Utilities* (April 30, 2010), available at https://archive.epa.gov/epawaste/nonhaz/industrial/special/fossil/web/xlsx/survey_database_041212.xlsx. The Final Rule's Regulatory Impact Analysis named more than thirty other owners and operators of recently, or soon-to-be, retired power plants where more than 100 legacy ponds are located. This included a State-by-State list detailing the number of already-inactive impoundments, and the utility responsible for each one. *See id.*; *see also* J.A. 1104, 1119. The database further identified 83 power plants that were scheduled to “fully close all coal-fired” facilities by the time the Rule went into effect, over 75% of which would house a legacy pond upon closure. J.A. 1116.

In sum, the EPA acknowledges that (i) it has the authority to regulate inactive units, (ii) it is regulating inactive units at active facilities, (iii) the risks posed by legacy ponds are at least as severe as the other inactive-impoundment dangers that the “[R]ule specifically seeks to address, and [(iv)] there is no logical basis for distinguishing between units that present the same risks.” 80 Fed. Reg. at 21,343. The EPA also considers it “quite clear” that older, unlined impoundments, Oral Arg. Tr. at 94:22—which are primarily legacy ponds—pose “the greatest risks to human health and the environment,” 80 Fed. Reg. at 21,451. Because the administrative record belies the EPA's stated reason for its reactive, rather than preventative, approach—the inability to identify the responsible parties—the Rule's legacy ponds exemption is unreasoned, arbitrary, and capricious.

D. Inadequate Notice by Owners and Operators

Because of RCRA's reliance on citizen enforcement, the statute requires the EPA to “develop and publish minimum guidelines for public participation” in the “development, revision, implementation, and enforcement” of any RCRA regulation. 42 U.S.C.

§ 6974(b)(1). The EPA implements that statutory requirement, as relevant here, by requiring the owners of Coal Residuals units to “maintain a publicly accessible Internet site” on which they timely disclose specified information about their compliance with RCRA regulations. 40 C.F.R. § 257.107(a).

The Environmental Petitioners wage several assaults on the Rule's Internet notice requirements, arguing that they do not provide adequate or timely notice to permit the public to participate in monitoring compliance with the Rule. For example, the Environmental Petitioners object that the Rule does not require owners or operators of new Coal Residual impoundments to post a design certification—an engineer's certification that the impoundment's liner meets the EPA's criteria—until sixty days after construction begins. 40 C.F.R. § 257.107(f)(1); see 40 C.F.R. § 257.70. That is too late, the Environmental Petitioners argue, to put the public on effective notice of any potential design problems. They also object that the Rule does not require timely public notification about the design or liner compliance of impoundment expansions, the structural integrity of facilities, protections against airborne coal dust, run-off control, hydraulic capacity requirements, or the nature of groundwater monitoring efforts.

***435 **251** The problem for Environmental Petitioners is that, although they participated in the notice-and-comment rulemaking process, they never voiced objections to the Rule's notice provisions that they now challenge. Having stood silent during the rulemaking, the Environmental Petitioners may not now raise their complaints for the first time in their petition for judicial review. See *Military Toxics Project v. EPA*, 146 F.3d 948, 956 (D.C. Cir. 1998); see also *City of Portland v. EPA*, 507 F.3d 706, 710 (D.C. Cir. 2007) (“Because [no] party raised this argument before the [EPA] during the rulemaking process, however, it is waived, and we will not consider it.”). The sanction does not exist as a procedural trap; the notice-and-comment process is in place so that the agency can consider and—if necessary—revise its proposed rule in light of public comments. *United States v. L.A. Tucker Truck Lines, Inc.*, 344 U.S. 33, 37, 73 S.Ct. 67, 97 L.Ed. 54 (1952) (“[O]rderly procedure and good administration require that objections to the proceedings of an administrative agency be made while it has opportunity for correction in order to raise issues reviewable by the courts.”). The EPA reasonably focuses its resources on consideration and/or modification of challenged portions of a proposed rule rather than unchallenged and apparently uncontroversial portions thereof. See *Interstate Nat. Gas Ass'n of Am. v. FERC*, 494 F.3d 1092, 1096 (D.C. Cir. 2007) (agency must respond to material comments only). Accordingly, we will not address this claim.

IV. Industry Petitioners' Challenges

Industry Petitioners bring a host of their own challenges to the Rule. As noted, these claims have dwindled over the course of this litigation. At the start, Industry Petitioners challenged eighteen provisions of the Final Rule and questioned the EPA's statutory authority to regulate inactive surface impoundments.⁴ In response, the EPA filed an unopposed motion to sever and remand two aspects of the Final Rule (regarding five regulatory provisions). On June 14, 2016, we granted the motion. Industry Petitioners continued to challenge the thirteen remaining substantive provisions as well as to attack the EPA's statutory authority. In the parties' proposed oral argument structure, however, Industry Petitioners moved to dismiss two additional challenges (regarding three regulatory provisions). We granted that motion as well.

⁴ Industry Petitioners' initial brief challenged portions of the following regulations: 40 C.F.R. §§ 257.50(c), 257.100 (inactive impoundments); 40 C.F.R. § 257.53 (definition of “beneficial use” and regulation of CCR “pile”); 40 C.F.R. § 257.60 (aquifer location restrictions); 40 C.F.R. §§ 257.73(e), (f)(1), 257.74(e) (minimum safety factors); 40 C.F.R. §§ 257.90(d), 257.96(a) (“release” response); 40 C.F.R. §§ 257.73(a)(4), 257.74(a)(4) (dike requirements); 40 C.F.R. § 257.103(a)(1)(i), (b)(1)(i) (prohibition on considering cost and inconvenience); 40 C.F.R. § 257.63(a) (seismic impact zone landfill requirements); 40 C.F.R. § 257.63(c)(1) (seismic impact zone deadline); 40 C.F.R. § 257.103 (inclusion of non-Coal Residuals waste streams in alternative closure provision); 40 C.F.R. §§ 257.95(h)(2), 257.97 (exclusion of risk-based compliance alternatives).

Accounting for these interim trims, Industry Petitioners now assert that the EPA (i) lacks authority to regulate inactive impoundments; (ii) failed to provide sufficient notice of its intention to apply the aquifer location criteria to existing

impoundments, to regulate Coal Residual piles of 12,400 or more tons, and to regulate the temporary storage of Coal Residuals destined for beneficial use; and (iii) acted arbitrarily in regulating residual piles of 12,400 or more tons, in regulating on-site Coal Residuals destined for beneficial use, in eliminating the risk-based compliance *436 **252 alternatives, in issuing location requirements based on seismic impact zones, and in imposing temporary closure procedures.⁵

⁵ These challenges encompass the following regulations (or portions thereof): 40 C.F.R. §§ 257.50(c), 257.100 (inactive impoundments); 40 C.F.R. § 257.103(a)(1)(i), (b)(1)(i) (alternative closure requirements); 40 C.F.R. § 257.63(a), (c)(1) (seismic impact zone requirements).

The EPA, now supported in part by Industry Petitioners, requests a remand of several of those issues, namely whether (i) the EPA has statutory authority to regulate inactive impoundments, (ii) the EPA arbitrarily regulated Coal Residuals piles of 12,400 or more tons, (iii) the EPA arbitrarily regulated on-site Coal Residuals destined for beneficial use, and (iv) the EPA arbitrarily eliminated risk-based compliance alternatives.

We grant the request for voluntary remand of the Coal Residuals pile-size and beneficial-use issues, and we dismiss as moot both the claim regarding risk-based compliance alternatives and the accompanying notice challenges. As to all remaining issues, we deny remand, and we deny the Industry Petitioners' petition for review.

A. EPA's Motion for Voluntary Remand

We have broad discretion to grant or deny an agency's motion to remand. See *Limnia, Inc. v. Department of Energy*, 857 F.3d 379, 381, 386 (D.C. Cir. 2017). We generally grant an agency's motion to remand so long as “the agency intends to take further action with respect to the original agency decision on review.” *Id.* (emphasis omitted). Remand has the benefit of allowing “agencies to cure their own mistakes rather than wasting the courts’ and the parties’ resources reviewing a record that both sides acknowledge to be incorrect or incomplete.” *Ethyl Corp. v. Browner*, 989 F.2d 522, 524 (D.C. Cir. 1993). Remand may also be appropriate if the agency's motion is made in response to “intervening events outside of the agency's control, for example, a new legal decision or the passage of new legislation.” *SKF USA Inc. v. United States*, 254 F.3d 1022, 1028 (Fed. Cir. 2001) (discussing *National Fuel Gas Supply Corp. v. FERC*, 899 F.2d 1244, 1249 (D.C. Cir. 1990) (per curiam)). Alternatively, “even if there are no intervening events, the agency may request a remand (without confessing error) in order to reconsider its previous position.” *Id.* at 1029.

In deciding a motion to remand, we consider whether remand would unduly prejudice the non-moving party. See *FBME Bank Ltd. v. Lew*, 142 F.Supp.3d 70, 73 (D.D.C. 2015). Additionally, if the agency's request appears to be frivolous or made in bad faith, it is appropriate to deny remand. See *SKF USA*, 254 F.3d at 1029; see also *Lutheran Church-Missouri Synod v. FCC*, 141 F.3d 344, 349 (D.C. Cir. 1998) (denying FCC's “novel, last second motion to remand” because it was based on agency's non-binding prospective policy statement).

To start, we decline the EPA's request to remand the challenge to the agency's authority to regulate inactive impoundments so that it can reconsider its interpretation of the statute, for two reasons. First, the EPA's statutory authority over inactive sites necessarily implicates the Environmental Petitioners' claim regarding legacy ponds. So, even if Industry Petitioners are willing to go along with a remand, Environmental Petitioners are not and remand would prejudice the vindication of their own claim. Second, this claim *437 **253 involves a question—the scope of the EPA's statutory authority—that is intertwined with any exercise of agency discretion going forward. Given that, the EPA has not met its burden of justifying its last-minute request for a remand in this case, and we proceed to the merits on this issue.

The EPA also initially requested a remand of its decision to exclude certain risk-based compliance measures. On July 30, 2018, however, the EPA promulgated amendments to the Final Rule. See *Hazardous and Solid Waste Management System: Disposal of Coal Combustion Residuals From Electric Utilities; Amendments to the National Minimum Criteria (Phase One,*

Part One) (“Final Rule Amendments”), 83 Fed. Reg. 36,435 (July 30, 2018). The Final Rule Amendments provide certain risk-based compliance measures and site-specific engineering certifications. Accordingly, we dismiss as moot Industry Petitioners’ challenge to 40 C.F.R. §§ 257.95(h) and 257.97. See *National Min. Ass’n v. Department of Interior*, 251 F.3d 1007, 1011 (D.C. Cir. 2001) (dismissing challenges as moot due to “substantial changes” in regulations and declaring “[a]ny opinion regarding the former rules would be merely advisory”).

For the remaining requests—(i) the regulation of Coal Residuals piles; (ii) the Proposed Rule’s notice of the Coal Residuals pile regulation; and (iii) the 12,400-ton threshold for beneficial use (and notice thereof)—we grant the EPA’s motion to remand.⁶ First and foremost, the EPA has explained that it plans to reconsider these provisions and has submitted a proposed timeline to the court, thereby satisfying the requirement for remand that it “take further action with respect to the original agency decision on review.” *Limnia*, 857 F.3d at 386 (emphasis omitted). Second, although the WIIN Act does not affect the validity of the Rule itself, it does provide the EPA with new tools to pursue its regulatory goals. See 42 U.S.C. § 6945(d)(4) (incorporating enforcement provisions of Sections 6927 and 6928).⁷

⁶ Specifically, we remand without vacating 40 C.F.R. § 257.53 (definition of “beneficial use” and regulation of Coal Residuals “pile”).

⁷ On March 23, 2018, the Consolidated Appropriations Act of 2018 was signed into law. Pub. L. No. 115-141, 132 Stat. 348. It allocates funds to the EPA to “implement[] a coal combustion residual permit program under” the WIIN Act. *Id.* at Division G, Title II. Accordingly, with its recently acquired funding, the EPA is to “implement a permit program” in non-participating states. 42 U.S.C. § 6945(d)(2)(B).

The EPA has explained that the Final Rule was promulgated with the understanding that there would be no regulatory “overseer,” and therefore the Final Rule itself should “account for and be protective of all sites, including those that are highly vulnerable.” 80 Fed. Reg. at 21,311; *id.* (explaining how “the requirement to establish national criteria and the absence of any requirement for direct regulatory oversight” influenced the Final Rule). Although a one-size-fits-all national standard might have been necessary for the self-implementing Final Rule, more precise risk-based standards are both feasible and enforceable under the individualized permitting programs and direct monitoring provisions authorized by the WIIN Act. See Oral Arg. Tr. 37:12–37:14 (counsel for EPA explaining that certain provisions of the Final Rule “cry out for site specific enforcement”). Thus, the regulatory tools authorized by the WIIN Act support the EPA’s request to reconsider certain provisions of the Rule. See *SKF USA*, 254 F.3d at 1028.

***438 **254** Moreover, the provisions we now remand stand unchallenged on their merits; accordingly, no party will suffer prejudice from remand without vacatur. See *FBME Bank*, 142 F.Supp.3d at 73. Indeed, at this stage in the litigation, all parties agree that the “beneficial use” and “Coal Residuals pile” provisions should stay in effect—at least until a new rule is promulgated. See EPA Remand Mot. 2 (“EPA seeks remand of these provisions without vacatur, and thus they remain in place and fully applicable[.]”). Moreover, the only parties that object to remand—Environmental Petitioners—did not challenge any of the relevant provisions in their petition; rather they *defended* the provisions as Intervenors. See generally *Env’tl. Intervenor-Resp’t Br.* 14–22. Accordingly, any opinion we issue regarding these provisions would be wholly advisory; it would resolve no active case or controversy and would award no relief. See *Chafin v. Chafin*, 568 U.S. 165, 172, 133 S.Ct. 1017, 185 L.Ed.2d 1 (2013) (case is non-justiciable if court is unable to grant concrete relief to any party).

We conclude that there is no reason to opine on the “beneficial use” and “Coal Residuals pile” provisions that the EPA wants remanded. At oral argument, the court pressed Industry counsel as to why Industry Petitioners did not simply dismiss their petition rather than acquiescing in the EPA’s motion. Oral Arg. Tr. 49–52. Industry counsel did not provide a clear answer. But he did make two concessions: First, he declared that Industry does not oppose remand. *Id.* at 50:16–50:23. Second, he acknowledged, “on a remand * * * the petition * * * is dismissed as a practical matter.” *Id.* at 51:6–51:10 (emphasis added). Counsel is correct in one respect. When combined with the statutory provision requiring any challenge to be brought within 90 days of the Rule’s promulgation, the legal effect of remand without vacatur is simple: The Rule remains in force and Industry

Petitioners cannot bring another challenge until and unless the EPA takes additional regulatory action. 42 U.S.C. § 6976(a)(1) (petition for review “shall be filed within ninety days from the date of * * * promulgation”). In effect, Industry Petitioners have withdrawn their petition with respect to the provisions for which it does not oppose remand.

Accordingly, we deny the EPA's motion to remand to itself Industry Petitioners' challenge to the EPA's regulation of inactive impoundments and Environmental Petitioner's challenge to the non-regulation of legacy ponds. We otherwise grant the motion to remand without vacatur.

B. Substantive Challenges

After deciding the issue of remand, we are left with Industry Petitioners' statutory argument and its three APA challenges to the Final Rule.

1. Authority to Regulate Inactive Impoundments

Industry Petitioners first challenge the EPA's regulatory authority to set any standards at all for inactive impoundments. That claim is without merit. Because those inactive sites house waste in “open dumps,” 42 U.S.C. § 6944, RCRA's plain text unambiguously confers regulatory authority on the EPA.

By its terms, RCRA empowers the EPA generally to define “which facilities shall be classified as sanitary landfills and which shall be classified as open dumps[.]” 42 U.S.C. § 6944. Section 6943 of RCRA, in turn, incorporates those classification standards into minimum criteria for State regulatory plans. *Id.* § 6943. Those statutory minimums both require States to “provide for the closing or upgrading of all existing *439 **255 open dumps” and prohibit “the establishment of new open dumps[.]” *Id.* § 6943(a)(2), (3). The statute also provides that, “[a]t a minimum,” the EPA must define sanitary landfills to include only facilities where “there is no reasonable probability of adverse effects on health or the environment from disposal of solid waste[.]” 42 U.S.C. § 6944(a).⁸ In this way, the statute creates a binary world: A facility is a permissible sanitary landfill, or it is an impermissible open dump. The EPA regulates both.

⁸ As noted earlier, *supra*, Part II, we leave open on remand the definitional and substantive impact on the EPA's discretion of the WIIN Act's express incorporation of the extant or successor EPA regulations under 40 C.F.R. Part 257 into the statutory definition of “sanitary landfill.”

While the statute allows the EPA to establish criteria for distinguishing between “open dumps” and “sanitary landfills,” it also offers some definitions of its own. RCRA defines “open dump” as “any facility or site where solid waste is disposed of which is not a sanitary landfill” or a site regulated under RCRA Subtitle C's more rigorous hazardous waste provisions. 42 U.S.C. § 6903(14). The statute likewise defines “sanitary landfill” as “a facility for the disposal of solid waste [that] meets the criteria published under section 6944,” *id.* § 6903(26), and that operates in accordance with the “applicable criteria for coal combustion residuals units under” 40 C.F.R. Part 257 or its successor regulations, *id.* § 6945(d)(6).

Finally, RCRA defines “disposal” as “the discharge, deposit, injection, dumping, spilling, leaking, or placing of any solid waste or hazardous waste into or on any land or water” in a manner by which “such solid waste or hazardous waste or any constituent thereof may enter the environment[.]” 42 U.S.C. § 6903(3).

Notwithstanding that broad assignment of regulatory authority, *see* 42 U.S.C. § 6912, Industry Petitioners argue that “inactive” impoundments—sites that contain, but no longer receive new, solid waste—cannot be “open dumps” within the EPA's regulatory ambit. Seizing on the phrase “is disposed of” in the definition of an “open dump,” *id.* § 6903(14), they contend that the site must actively receive new waste to come within the statutory definition of a regulable waste disposal dump. Industry Petitioners

also argue that the words used to define “disposal”—“discharge, deposit, injection, dumping, spilling, leaking, or placing,” *id.* § 6903(3)—all require present and ongoing activity.

RCRA's reach, however, is not so narrow as Industry Petitioners suppose. Rather, a straightforward reading of the statute's language allows for the regulation of inactive sites.

We start by recognizing that, in RCRA, Congress delegated to the EPA “very broad” regulatory authority over waste disposal. *In re Consolidated Land Disposal Regulation Litig.*, 938 F.2d 1386, 1388 (D.C. Cir. 1991). We therefore review the Industry Petitioners’ challenge under the two-step *Chevron* framework. Under this rubric, if RCRA is unambiguous, its text controls. See *Chevron, U.S.A., Inc. v. Natural Res. Def. Council, Inc.*, 467 U.S. 837, 842–843, 104 S.Ct. 2778, 81 L.Ed.2d 694 (1984); see also *City of Arlington v. FCC*, 569 U.S. 290, 297, 133 S.Ct. 1863, 185 L.Ed.2d 941 (2013) (holding that an agency's interpretation of the “jurisdictional” reach of its governing statute merits *Chevron* deference). If, on the other hand, the statute is silent or equivocal, we ask only whether the agency has offered a reasonable interpretation of the statute. *Chevron*, 467 U.S. at 843, 104 S.Ct. 2778.

***440 **256** Resolution of this issue begins and ends with RCRA's plain text. The definition of “open dump,” which is the key term at issue, does not use the word “disposal.” It uses the phrase “is disposed of”: An “open dump” is “any facility or site where solid waste *is disposed of*.” 42 U.S.C. § 6903(14) (emphasis added). To divine its proper meaning, we must interpret the operative phrase “is disposed of” as a whole. Importantly, while the “is” retains its active present tense, the “disposal” takes the form of a past participle (“disposed”). In this way, the disposal itself can exist (it “is”), even if the act of disposal took place at some prior time. See *Florida Dep't of Revenue v. Piccadilly Cafeterias, Inc.*, 554 U.S. 33, 39, 128 S.Ct. 2326, 171 L.Ed.2d 203 (2008) (describing a past participle as a “verb form” that reaches “past or completed action”) (quoting AMERICAN HERITAGE DICTIONARY 1287 (4th ed. 2000)); *Sherley v. Sebelius*, 644 F.3d 388, 403 n.4 (D.C. Cir. 2011) (Henderson, J., dissenting) (noting that the statute at issue “combine[d] the present tense ‘are’ with the past participle ‘destroyed’ ” to “signify conduct that ha[d] already occurred”) (citations omitted).⁹

⁹ The concurring opinion notes that *Piccadilly Cafeterias* was ultimately resolved as a *Chevron* step two case. Concur Op. 452 n. 21. True enough. But before the Court got to the *Chevron* step two stage of its analysis, it first endorsed, as the “more natural reading” of the relevant text, Florida's construction of the past participle as “unambiguously limit[ing]” certain tax exemptions in bankruptcy proceedings. 554 U.S. at 39, 41, 128 S.Ct. 2326. Only then did the Court, for argument's sake, “assum[e]” that the relevant text were “ambiguous,” and hold that any ambiguity would fall in Florida's favor. *Id.* at 41, 128 S.Ct. 2326. The Court, in short, never found any ambiguity in the past participle's coverage of “past or completed action[s],” and in fact embraced that more natural meaning. *Id.* at 39, 128 S.Ct. 2326. We too give Congress's adjectival past participle “is disposed of” its natural meaning.

Properly translated then, an open dump includes any facility (other than a sanitary landfill or hazardous waste disposal facility), where solid waste still “is deposited,” “is dumped,” “is spilled,” “is leaked,” or “is placed,” regardless of when it might have originally been dropped off. See 42 U.S.C. § 6903(3), (14). In other words, the waste in inactive impoundments “is disposed of” at a site no longer receiving new waste in just the same way that it “is disposed of” in a site that is still operating.

Tellingly, not even Industry Petitioners embrace the full import of their interpretation. They agree that previously deposited waste “is disposed of” at an impoundment site, so long as the site is actively accepting new waste. But if EPA's authority reaches only active disposal, it stands to reason that its authority over the site extends only to that newly deposited (or actively leaking) waste. But Industry Petitioners do not push this point—probably because, as a practical reality, waste is no less “disposed of” at a site the day after operations cease than it was the day before. That is, the waste previously dumped is still currently “placed” or “deposited” there. 42 U.S.C. § 6903(3), (14). In other words, the pile of Coal Residuals retains its regulated status whether or not anyone adds to the pile.

Think of it this way: If a kindergarten teacher tells her students that they must clean up any drink that “is spilled” in the room, that would most logically be understood to mean that a student must clean up her spilled drink even if the spill is already completed and nothing more is leaking out of the carton. A student who refused to clean up that completed spill (as Industry Petitioners would have it) might well find himself on time out.

***441 **257** What's more, the Industry Petitioners' reading butts up against the binary world created by the statute. RCRA creates two categories for Subtitle D waste: open dumps and sanitary landfills. Industry Petitioners offer no explanation of where “inactive” sites fit into their understanding of that landscape. Nor do they explain why, once the last person turns off the lights, Congress's concern for the substantial health and environmental dangers posed by that pile of toxic waste would completely evaporate. As our concurring colleague aptly notes, “the disposal of [Coal Residuals] in an impoundment is not a discrete act. If it were, the EPA would regulate only the transfer of [Coal Residuals] from a power facility into an impoundment, at which point the ‘disposal’ would end.” Concur Op. at 454.

The concurring opinion spies ambiguity only by splitting the operative verb “is disposed” into two distinctly analyzed parts: “is” and “disposed.” Concur Op. 450–52. But just as courts must not “construe statutory phrases in isolation,” we surely must read a single verb “as a whole” and not in pieces. *United States v. Morton*, 467 U.S. 822, 828, 104 S.Ct. 2769, 81 L.Ed.2d 680 (1984). Even more so, we must give effect to the whole adjectival phrase “is disposed of.” A site where garbage “is disposed of” is the place where garbage is dumped and left. The status of that site does not depend on whether or not more garbage is later piled on top. A garbage dump is a garbage dump until the deposited garbage is gone.

In short, as facilities “where solid waste is disposed of,” 42 U.S.C. § 6903(14), inactive impoundments *are* “open dumps,” unless they fall into one of two statutory exceptions—neither of which the Industry Petitioners claim applies to their inactive impoundments.¹⁰ And no one denies that the EPA has authority to regulate (and to prohibit) “open dumps.”

¹⁰ The two exceptions, which Industry Petitioners do not contend apply here, are for “sanitary landfills,” as defined by the EPA, 42 U.S.C. § 6944, and sites housing “hazardous” waste regulated separately under RCRA Subtitle C, *id.* § 6921 *et seq.*

Instead, the Industry Petitioners point to cases interpreting the term “disposal” in the Superfund statute, 42 U.S.C. § 9601 *et seq.*, to apply only to ongoing disposals. True enough. But those cases turned on the Superfund statute's different language, which is “at the time of disposal,” not the RCRA phrase “is disposed of.” See *id.* § 9607(a) (responsible persons subject to recovery costs under the Superfund statute include “any person who at the time of disposal of any hazardous substance owned or operated any facility at which such hazardous substances were disposed of”). The specific signification of that language lies at the heart of those court rulings. See *Carson Harbor Vill., Ltd. v. Unocal Corp.*, 270 F.3d 863, 871 (9th Cir. 2001) (“We must decide in this case whether the Partnership Defendants * * * owned the contaminated property ‘at the time of disposal of any hazardous substance.’”) (citing 42 U.S.C. § 9607(a)(2)).¹¹

¹¹ See also *ABB Indus. Sys., Inc. v. Prime Tech., Inc.*, 120 F.3d 351, 356 (2d Cir. 1997) (“Under [the Superfund statute], a prior owner or operator is a responsible party if it controlled the site ‘at the time of disposal’ of a hazardous substance.”); *United States v. CDMG Realty Co.*, 96 F.3d 706, 712–713 (3d Cir. 1996) (“HMAT contends that Dowel is liable as a person who owned or operated the facility ‘at the time of disposal’ of a hazardous substance.”); *Joslyn Mfg. Co. v. Koppers Co.*, 40 F.3d 750, 760 (5th Cir. 1994) (similar).

The Superfund statute also contains an “innocent landowner” defense by which a person can avoid liability if “the disposal or ***442 **258** placement of the hazardous substance” occurred prior to that party's acquisition of the property. 42 U.S.C. § 9601(35)(A). That strengthens the notion that “at the time of disposal,” as used in the Superfund statute, is time-dependent and refers to the act of placing the waste in the holding site. See *Carson Harbor Vill.*, 270 F.3d at 882. RCRA's distinct language comes with no such limiting textual indicia.

In short, the fundamental flaw in the Industry Petitioners' effort to limit EPA regulation to active impoundments is that they focus on the wrong text. For all their efforts to explain the meaning of the single word "disposal," they fail to grapple with the full phrase "is disposed of." RCRA is explicit that inactive sites may qualify as open dumps if they are facilities where waste "is disposed of," regardless of whether they are also facilities where more "disposal" continues to occur. As is often true in statutory interpretation, the words make all the difference.

Even if the text were ambiguous, the EPA's interpretation is eminently reasonable under *Chevron* step two. First, the same reasons supporting our interpretation of the plain statutory text demonstrate with even greater force the reasonableness of the EPA's interpretation.

Second, the EPA's interpretation directly advances RCRA's stated regulatory purpose. RCRA directs the EPA to develop standards that limit permissible waste sites "[a]t a minimum" to those with "no reasonable probability of adverse effects on health or the environment from disposal of solid waste[.]" 42 U.S.C. § 6944(a). No one denies that inactive impoundments can have significant adverse environmental and health effects. In fact, the EPA persuasively explains that inactive sites often pose even greater health risks given their age and accompanying deterioration. 80 Fed. Reg. at 21,343 (indicating that "the risks are primarily driven by the older existing units"); see also *id.* (noting that leaks into the Dan River from an inactive impoundment occasioned publication of this very Rule).

The EPA's construction of the text is thus consistent with a straightforward reading of statutory text and RCRA's central purpose. See *In re Consolidated Consol. Land Disposal Regulation Litig.*, 938 F.2d at 1389 (EPA's reading of the term "disposal" in RCRA's Subtitle C, 42 U.S.C. § 6924, to include "the continuing presence of waste" was reasonable under *Chevron* step two).

For all of those reasons, the Industry Petitioners' attempt to confine the EPA's authority to only active impoundments fails.

2. Notice Challenge to Aquifer Requirements

Under 5 U.S.C. § 553, an agency is required to give notice of a proposed rule and allow interested parties to comment on the rule before it is promulgated. Although the final rule need not be identical to the proposed rule, it must be the "logical outgrowth" thereof. *Shell Oil Co. v. EPA*, 950 F.2d 741, 747 (D.C. Cir. 1991) (per curiam). "A rule is deemed a logical outgrowth if interested parties 'should have anticipated' that the change was possible, and thus reasonably should have filed their comments on the subject during the notice-and-comment period." *Northeast Md. Waste Disposal Auth. v. EPA*, 358 F.3d 936, 952 (D.C. Cir. 2004) (per curiam) (citing *City of Waukesha v. EPA*, 320 F.3d 228, 245 (D.C. Cir. 2003)).

The Final Rule requires that all surface impoundments be located no fewer than five feet above the uppermost aquifer or, alternatively, that the owner or operator of the impoundment demonstrate *443 **259 that the impoundment will not be subject to a hydraulic connection with the groundwater supply as groundwater levels fluctuate over the course of the year.¹² 40 C.F.R. § 257.60(a); see 80 Fed. Reg. at 21,361. Industry Petitioners argue that the EPA did not give adequate notice that this provision would apply to *existing* surface impoundments because the proposed regulation applied only to "[n]ew [Coal Residuals] landfills and new [Coal Residuals] surface impoundments[.]" 75 Fed. Reg. at 35,241.¹³

¹² A "hydraulic connection" means a connection between the [Coal Residuals] unit and the underground water table. 80 Fed. Reg. at 21,362. The EPA received comments explaining that "fluctuations in groundwater levels in many geological settings can exceed ten feet over the course of the year." *Id.* at 21,361. To account for this change in aquifer levels, the EPA revised its definition of "uppermost aquifer" to "specify that the measurement of the upper limit of the aquifer must be made at a point nearest to the natural ground surface to which the aquifer rises during the wet season." *Id.* at 21,362.

¹³ In the preamble to the Final Rule, the EPA acknowledged that, “[i]n the proposed rule, the regulatory language should have included ‘all surface impoundments’ as opposed to only ‘new surface impoundments.’” 80 Fed. Reg. at 21,360.

The Industry Petitioners’ argument ignores the plain language of the preamble to the Proposed Rule, which declares: “[b]y contrast [to landfills] * * * the proposed regulations would apply all of the location restrictions to *existing* surface impoundments.” 75 Fed. Reg. at 35,198 (emphasis added). This is exactly what the Final Rule prescribes. See 40 C.F.R. § 257.60. Indeed, the Rule is not only the “logical outgrowth” of the Proposed Rule; it faithfully tracks the goals set forth in the preamble. See *Shell Oil Co.*, 950 F.2d at 747. The preamble—and the Proposed Rule as a whole—advised the public that the EPA was at least *considering* applying the aquifer restrictions to existing impoundments, thereby inviting Industry’s comments on the topic. *Id.*¹⁴

¹⁴ Although the EPA may not “bootstrap notice from a comment,” the sheer volume of Industry Petitioners’ comments on this very provision confirms that notice was adequate. *Fertilizer Inst. v. EPA*, 935 F.2d 1303, 1312 (D.C. Cir. 1991) (internal quotation marks omitted). The EPA explains: “Overwhelmingly, the issue receiving the most comment was EPA’s intention to subject existing [Coal Residuals] surface impoundments to all of the new location criteria.” 80 Fed. Reg. at 21,360. Industry Petitioners’ comments confronted the aquifer location restrictions, including their applicability to existing surface impoundments, head-on. See, e.g., Comments of the Utility Solid Waste Activities Group on Proposal, Nov. 19, 2010, J.A. 775 (“EPA states in the preamble to the proposal that it intends to subject existing surface impoundments to all of these new location restrictions * * *.”) (emphasis omitted). When combined with the clarity of the preamble, Industry Petitioners’ comments illustrate that it was both aware of, and troubled by, the aquifer restrictions.

3. Seismic Impact Zone Criteria

The Final Rule contains two seismic impact requirements. First, the Rule imposes safety assessment criteria on surface impoundments over a specific size. 40 C.F.R. § 257.73(e). These criteria had an implementation deadline of October 17, 2016. *Id.* § 257.73(f). Because the compliance deadline lapsed before oral argument, Industry Petitioners voluntarily dismissed this challenge. See Sept. 27, 2017 Per Curiam Order Granting Motion to Dismiss.

Second, every new Coal Residual landfill and landfill expansion, as well as any new and existing surface impoundment, is subject to location restrictions that prohibit operation in a “seismic impact zone”¹⁵ unless *444 **260 the facility demonstrates that it has the appropriate structural components, including liners, leachate collection and removal systems and surface water control systems. 40 C.F.R. § 257.63(a). For existing surface impoundments, the deadline for demonstrating compliance with the Rule is October 17, 2018—four and one-half years after the Rule was promulgated. *Id.* § 257.63(c)(1).

¹⁵ “Seismic impact zone means an area having a 2% or greater probability that the maximum expected horizontal acceleration, expressed as a percentage of the earth’s gravitational pull (g), will exceed 0.10 g in 50 years.” 40 C.F.R. § 257.53.

Industry Petitioners attack the seismic impact zone requirements on three fronts; they argue that the EPA was arbitrary and capricious in: (i) shortening the operating life for existing impoundments from five years to four years; (ii) applying the seismic impact zone location restriction to new Coal Residual landfills and landfill expansions; and (iii) regulating the structure of Coal Residual landfills based on a 2,500-year seismic event. The parties brief these three issues separately, and we likewise address—but reject—each of Industry Petitioners’ challenges in turn.

a. Operating Expiration

Industry Petitioners argue that, although the Proposed Rule had a five-year operating expiration for impoundments, the Final Rule arbitrarily reduced that window to four years. Industry Pet'rs' Br. 45. As a corollary, Industry Petitioners argue that four years is not enough time for impoundment owners and operators to switch from wet to dry Coal Residuals disposal. Industry Pet'rs' Reply Br. 21–22.

Industry Petitioners' arguments misconstrue both the Proposed Rule and the Final Rule. The section of the Proposed Rule that Industry Petitioners cite for the five-year deadline (proposed 40 C.F.R. § 257.65(a)) *does not apply* to the seismic impact zones; instead, it applies to “unstable areas.” *See* 75 Fed. Reg. at 35,242–35,243. Indeed, the Proposed Rule does not prescribe an explicit operating deadline for seismic impact zones at all.

Moreover, even assuming the proposed five-year deadline for “unstable areas” applies to seismic impact zones, the Proposed Rule reads: “Existing [Coal Residuals] landfills and surface impoundments that cannot make the demonstration * * * must close by [date five years after the effective date of the final rule].” 75 Fed. Reg. at 35,242 (brackets in original). The “must close by” language in the Proposed Rule is different from the language of the Final Rule, which demands only that the regulated facility “complete the demonstration [that the site has met the relevant structural requirements] no later than October 17, 2018.” 40 C.F.R. § 257.63(c)(1). Contrary to Industry Petitioners' representation, then, the Final Rule gives the disposal sites four years before they must demonstrate compliance. *See id.* Only if they *fail* in that demonstration must they begin the closure process. *Id.* And once the closure process begins, they have at least five years to complete it. *See id.* § 257.102(f)(1)(ii).¹⁶

¹⁶ Manifesting additional flexibility, the Final Rule's closure timeframe may be extended up to ten years (in consecutive two-year periods) “if the owner or operator can demonstrate that it was not feasible to complete closure of the [Coal Residuals] unit within the required timeframes due to factors beyond the facility's control.” *Id.* § 257.102(f)(2)(i)–(2)(ii) (B). Accordingly, in some circumstances the impoundment need not complete the closure process until 19 years after the Rule's enactment date.

Once the Rule's timeline is correctly understood, there is nothing in the record to suggest the Rule's operating deadline is arbitrary and capricious. Indeed, Industry's *445 **261 comments confirm that the Rule's timeline will provide a sufficient period for a non-compliant facility to close (within nine years, and more if it meets the extension requirements). *See, e.g.,* Comments of American Elec. Power Co. on Proposal at 5, J.A. 581 (“[A]t some locations, it will take at least four years from the time the new [Coal Residuals] rule becomes effective to accomplish the wet-to-dry conversion and to accomplish the switch to dry.”); Comments of SCANA Corp. on Proposal at 7, J.A. 579 (“The time frame required to site, design, permit, and construct a landfill in today's regulatory environment is at least 5 to 10 years.”). The EPA's conclusions are consistent with Industry Petitioners' comments. *See* 75 Fed. Reg. at 35,202 (“[Under Subtitle C,] EPA believes that five years will, in most cases, be adequate time to complete proper and effective facility closure and to arrange for alternative waste management * * *. EPA is aware of no reason that the time frames would need to differ under subtitle D * * *.”). In sum, we conclude that the EPA's operating timeline is not arbitrary and capricious.

b. Seismic Restrictions for New Landfills

The seismic location restrictions apply to impoundments as well as new landfills and landfill expansions, but they do not apply to existing landfills. 40 C.F.R. § 257.63(a). This distinction reflects, *inter alia*, the EPA's determination that “the risks associated with [Coal Residuals] surface impoundments are substantially higher than the risks associated with [Coal Residuals] landfills, by approximately an order of magnitude.” 80 Fed. Reg. at 21,360. Industry Petitioners argue that, if landfills are universally less dangerous than surface impoundments, they should not be subject to the same seismic standard as surface impoundments. In other words, the argument goes, if it is acceptable to exempt existing landfills from the seismic location restrictions, it is acceptable to exempt new landfills as well. Because Industry Petitioners failed to make this argument before the EPA, however, we reject it.¹⁷

17 The EPA makes its failure-to-exhaust argument in its opening brief. Rep't Br. 71–72. Industry's reply brief offers no rebuttal. *See generally* Industry Pet'r's Reply Br.

“Under ordinary principles of administrative law a reviewing court will not consider arguments that a party failed to raise in timely fashion before an administrative agency.” *Sims v. Apfel*, 530 U.S. 103, 114, 120 S.Ct. 2080, 147 L.Ed.2d 80 (2000) (Breyer, J., dissenting); accord *Natural Resources Def. Council, Inc. v. EPA*, 25 F.3d 1063, 1073 (D.C. Cir. 1994) (“We do not reach the merits of this challenge because petitioners failed to raise this question of statutory and regulatory construction before the agency during the notice and comment period. They have therefore waived their opportunity to press this argument in court.”); *see* discussion, *supra*, at 434–35.

This fundamental principle of administrative law applies squarely to Industry Petitioners' challenge. *Natural Resources Def. Council*, 25 F.3d at 1073. In the Proposed Rule, the EPA explained that, because many Coal Residuals disposal sites are within seismic impact zones, it was “concerned that such facilities would be unable to meet the requirements, because retrofitting would be prohibitively expensive and technically very difficult in most cases, and [they] would therefore be forced to close.” 75 Fed. Reg. at 35,198. Accordingly, the EPA sought comments on “the number of existing [Coal Residuals] landfills located in these sensitive areas” and *446 **262 the corresponding effect their closure would have on the national disposal capacity. 80 Fed. Reg. at 21,360. In spite of the invitation to comment, Industry Petitioners cannot point to any record evidence that they questioned the application of the Rule to new Coal Residuals landfills.¹⁸

18 Instead, comments focused on the non-regulation of *existing* landfills, responding to the Proposed Rule's conclusion that applying the seismic location restrictions to existing Coal Residuals landfills could cause “disposal capacity shortfalls * * * [that] raise greater environmental and public health concerns than the potential failure of the [Coal Residuals] landfills in these locales.” 80 Fed. Reg. at 21,360.

Put differently, the EPA did not address the argument that new Coal Residuals landfills or landfill expansions should be exempted because the public comments gave no reason to question the position it announced in the Proposed Rule. “Indeed, the notion that a yet-to-be built landfill need *not* comply with basic seismic location restrictions that are designed to avoid the potentially catastrophic events identified in the record, borders on irrational.” Resp't Br. 73. In light of Industry Petitioners' failure to alert the EPA to the issue while the latter was promulgating the Final Rule, we decline reach it.

c. The 2,500-Year Standard

Both the seismic location restrictions and the seismic safety assessment criteria incorporate a 2,500-year standard. 80 Fed. Reg. at 21,384. This means a disposal site in a seismic impact area must be designed to withstand the maximum expected impact of a 2,500-year earthquake. *Id.* In establishing the 2,500-year standard, the EPA considered multiple engineering sources, including (i) *Federal Guidelines for Dam Safety: Earthquake Analyses and Design of Dams*, issued by the Federal Emergency Management Agency (FEMA), and (ii) *Minimum Design Loads for Buildings and Other Structures*, International Building Code, a publication of the American Society of Civil Engineers (ASCE). 80 Fed. Reg. at 21,384; *id.* at 21,384–21,385 nn.98–99. The EPA also consulted geological sources, including the criteria of the National Earthquake Hazards Reduction Program (NEHRP) of the U.S. Geological Survey. 75 Fed. Reg. at 35,201. Further, the Final Rule's 2,500-year standard precisely mirrors the EPA's regulations governing municipal solid waste management. 75 Fed. Reg. at 35,193 (referencing 40 C.F.R. § 258.18).

In light of the engineering, geological and regulatory sources informing and supporting the 2,500-year standard, Industry Petitioners face an uphill battle. They nonetheless challenge the application of the seismic location restrictions to landfills—as opposed to impoundments—because landfills pose comparatively fewer risks than impoundments. Thus, although FEMA's dam safety guidelines are applicable to dam-like impoundments structures, ASCE's International Building Code is applicable to buildings, and EPA's municipal landfill regulations are applicable to urban landfills, Industry Petitioners argue that Coal

Residuals landfills are different and should be subject to a less demanding standard. In short, it asserts that the rule is overprotective and therefore arbitrary and capricious. We disagree.

Industry Petitioners' argument rests on the assumption that the EPA adopted the 2,500-year standard "without explanation." Industry Pet'rs' Br. 48. To the contrary, the EPA first examined the structures of municipal landfills and concluded that they were "very similar to those found at [Coal Residuals] disposal facilities, and the regulations applicable to such units would be expected to address the risks presented by *447 **263 the constituents in [Coal Residuals] wastes." 75 Fed. Reg. at 35,193 (referencing 40 C.F.R. § 258.18). It then cross-referenced the 2,500-year standard with the criteria adopted by the U.S. Geological Survey and other engineering experts before adopting the Final Rule. *Id.* at 35,201. Indeed, some Industry members conceded that "the NEHRP/USGS 2%PE/50y [2,500-year] standard provides a sufficient margin of safety." Comments of the Southern Company at 34, J.A. 481. Industry Petitioners may disagree, but the EPA's reasoning was fully explained and is supported by the record.

Conversely, Industry Petitioners have not cited any record evidence that either challenges or provides an alternative to the 2,500-year standard. The best they can do is highlight comments stating generally that the rule is "overly protective."¹⁹ Industry Pet'rs' Br. 47–48. This broad stroke does not carry their argument very far. Once the EPA selected the Subtitle D rather than the Subtitle C regulatory path, it was charged with developing uniform national standards rather than implementing a site-specific permit program. *See generally* 42 U.S.C. § 6944(a) (requiring EPA to develop minimum criteria for all disposal sites). Consistent with that mandate, the EPA developed criteria for all climates and conditions within seismic impact zones. Accordingly, it is of no moment that the criteria might be "overprotective" for a western landfill located miles from any water source. *See* Comments of Electric Power Research Institute on Proposal at 89, J.A. 596 (explaining that "cap and liners" may not be necessary in "western areas where * * * the total rainfall is less than 10 inches per year"). Congress demanded national minimum standards that ensure "no reasonable probability of adverse effects on health or the environment." 42 U.S.C. § 6944(a). The 2,500-year standard does just that.

¹⁹ Industry Petitioners claim that one commenter suggested a 250-year standard. *See* Comments of FirstEnergy Corp. at 11, J.A. 598. Again, Industry Petitioners misread the record. FirstEnergy's comment declares:

EPA intends to incorporate seismic performance in section 257.63 of the proposed rule. One alternative suggested by EPA is the use of seismic impact zones. A second alternative suggests adopting criteria of the National Earthquake Hazards Reduction Program (NEHRP) of the U.S. Geological Survey, which was used to develop national seismic hazard maps. It appears the horizontal acceleration expressed as 0.01g in 250 years in the agency's first approach closely matches the 2% ground motion probability in 50 years that the seismic maps are based upon.

Id. Thus, the "250 years" corresponds to the horizontal acceleration rate rather than a "ground motion probability" calculation such as the one upon which the 2,500-year model is based (2% in 50 years = 100% in 2,500 years). It is not a free-standing 250-year standard. That is, FirstEnergy does not appear to offer an alternative standard.

4. The Alternative Closure Option

RCRA states in plain terms that the "open dumping of solid waste * * * is prohibited." 42 U.S.C. § 6945(a). Thus, if a disposal site is classified as an open dump, it must either retrofit or close. *See id.* The Final Rule stays true to the statutory mandate. Under the Final Rule, certain events—such as groundwater sampling that reveals an excess of Coal Residuals constituents in the water table—establish the disposal site as an "open dump," which triggers the Rule's closure requirements. 40 C.F.R. § 257.101. If the closure requirements are triggered, the surface impoundment or landfill ordinarily has six months to either retrofit its facility or to stop receiving Coal Residuals and to begin the closure process. *Id.* § 257.101(a)(2), (4). In other words, the statutory (and regulatory) *448 **264 presumption is that a non-compliant disposal site—one that is polluting the groundwater—will close. *Id.*

Notwithstanding this presumption, the Rule includes an "alternative closure" exemption that allows a non-compliant Coal Residuals disposal site (an "open dump") to receive Coal Residuals for an additional five years before it ceases operations. 40

C.F.R. § 257.103. In order to qualify for the alternative closure exception, the owner or operator must certify that, *inter alia*: “No alternative disposal capacity is available on-site or off-site.” *Id.* § 257.103(a)(1)(i). In making the certification, “[a]n increase in costs or the inconvenience of existing capacity is not sufficient to support qualification under this section.” *Id.*

Describing the rationale for its alternative closure exemption, the EPA explained that it did not want to force facilities to close and create power shortages “because there is no place in which to dispose of the resulting waste.” 80 Fed. Reg. at 21,423. The preamble includes an example: “[W]hile it is possible to transport dry ash off-site to [an] alternate disposal facility[,] that simply is not feasible for wet-generated [Coal Residuals]. Nor can facilities immediately convert to dry handling systems. As noted previously, the law cannot compel actions that are physically impossible.” *Id.*

Industry Petitioners argue that ignoring costs and inconvenience in the alternative disposal criteria is arbitrary and capricious because it effectively renders the exemption a nullity: “If costs or inconvenience cannot be evaluated, off-site disposal capacity—no matter where it is located or how much it will cost to send [Coal Residuals] there—will always be ‘available’ somewhere.” Industry Pet’rs’ Br. 38–39. At oral argument, Industry Petitioners lamented that they might be required to hire a fleet of 1,000 vacuum trucks in order to transfer wet Coal Residuals to an off-site disposal facility. Oral Arg. Tr. 23:22–23:23. This result, it argues, would make nonsense of the alternative closure requirements.

Industry Petitioners’ hyperbole faces a roadblock. As the United States Supreme Court has explained, if the Congress directs the EPA to “regulate on the basis of a factor that on its face does not include cost, the Act normally should not be read as implicitly allowing the agency to consider cost anyway.” *Michigan v. EPA*, — U.S. —, 135 S.Ct. 2699, 2709, 192 L.Ed.2d 674 (2015) (citing *Whitman v. American Trucking Ass’ns*, 531 U.S. 457, 469–472, 121 S.Ct. 903, 149 L.Ed.2d 1 (2001)). Applying this rule, the Court held that the EPA is prohibited from considering costs when developing its primary ambient air quality standards under the Clean Air Act because the statute does not mention costs but instead demands standards “requisite * * * to protect the public health with an adequate margin of safety.” *American Trucking*, 531 U.S. at 475–476, 121 S.Ct. 903 (quoting 42 U.S.C. § 7409(b)(1)). Thus, “public health” provided the statutory measuring stick in that instance, notwithstanding flexible words such as “requisite” and “adequate” that the trucking industry suggested might allow the agency to consider costs. *Id.* at 468, 121 S.Ct. 903.

Simply put, “to prevail in their present challenge, [Industry] must show a textual commitment of authority to the EPA to consider costs.” *American Trucking*, 531 U.S. at 468, 121 S.Ct. 903. Under any reasonable reading of RCRA, there is no textual commitment of authority to the EPA to consider costs in the open-dump standards.²⁰ RCRA’s statutory language *449 **265 instructs the EPA to classify a disposal site as a sanitary landfill and not an open dump only “if there is no reasonable probability of *adverse effects on health or the environment* from disposal of solid waste at such facility.” 42 U.S.C. § 6944(a) (emphasis added). There is no explicit mention of costs in section 6944; nor is there any flexible language such as “appropriate and necessary” that might allow the EPA to consider costs in its rulemaking. See *Michigan v. EPA*, 135 S.Ct. at 2709. This stands in stark contrast with other sections of Title 42—such as the Bevill Amendment—where the Congress expressly required the EPA to consider, *inter alia*, “the costs of * * * alternatives” in determining whether Coal Residuals should be classified as hazardous waste. See 42 U.S.C. § 6982(n)(6).

²⁰ At oral argument, neither Industry Petitioners nor the EPA could identify a statutory provision that allows the EPA to consider costs. Oral Arg. Tr. 83:15–83:23; 116:02–116:10.

With *Michigan v. EPA* and *American Trucking*, then, it is far from clear that the EPA could consider costs even if it wanted to. See *Michigan v. EPA*, 135 S.Ct. at 2707 (explaining that “appropriate and necessary” language could require consideration of costs in some contexts but not others). In any case, there is no statutory support for the assertion that EPA was *required* to consider costs in developing its alternative closure plan. Excluding consideration of costs and convenience may narrow the alternative closure exemption but *including* cost and convenience would appear to violate RCRA’s statutory mandate and run afoul of Supreme Court precedent. The EPA was neither arbitrary nor capricious in its decision to avoid testing that legal limit.

V. Conclusion

In sum, we deny the EPA's motion for us to hold these petitions in abeyance. We grant in part the EPA's motion for a voluntary remand, remanding to the EPA the provisions in the Final Rule pertaining to (i) the definition of "Coal Residuals Piles," *see* 40 C.F.R. § 257.53; (ii) the 12,400-ton beneficial use threshold, *see id.*; and (iii) the alternative groundwater protection standards, *see id.* § 257.95(h)(2). We deny the EPA's motion to remand the provisions in the Final Rule pertaining to inactive surface impoundments and landfills at active power plants, *see id.* §§ 257.50(c), 257.100, and inactive surface impoundments at inactive power plants, *see id.* § 257.50(e).

On the claims raised by Environmental Petitioners, we hold that the EPA acted arbitrarily and capriciously and contrary to RCRA in failing to require the closure of unlined surface impoundments, in classifying so-called "clay-lined" impoundments as lined, and in exempting inactive surface impoundments at inactive power plants from regulation. We therefore vacate and remand the provisions of the Final Rule that permit unlined impoundments to continue receiving coal ash unless they leak, *see id.* § 257.101(a), classify "clay-lined" impoundments as lined, *see* 40 C.F.R. § 257.71(a)(1)(i), and exempt from regulation inactive impoundments at inactive facilities, *see* 40 C.F.R. § 257.50(e). We reject as forfeited Environmental Petitioners' challenges to the Final Rule's public notice provisions.

Regarding the Industry Petitioners' claims, we hold that (i) the EPA has statutory authority to regulate inactive impoundments; (ii) the EPA provided sufficient notice of its intention to apply the aquifer location criteria to existing impoundments; (iii) the EPA did not arbitrarily *450 **266 issue location requirements based on seismic impact zones; and finally (iv) the EPA did not arbitrarily impose temporary closure procedures. As to the regulation of Coal Residuals piles of 12,400 tons or more and the regulation of Coal Residuals destined for beneficial use, we remand to the agency as requested. We dismiss as moot the two accompanying notice challenges and the issue of risk-based compliance alternatives.

So ordered.

Opinion concurring in part and concurring in the judgment in part filed by Circuit Judge [Henderson](#).

[Karen Lecraft Henderson](#), Circuit Judge, concurring in part and concurring in the judgment in part:

A central question before us is whether the EPA exceeded its statutory authority under the Resource Conservation and Recovery Act (RCRA), 42 U.S.C. §§ 6901 *et seq.*, by applying its Final Rule, 80 Fed. Reg. 21,302 (Apr. 17, 2015), to an impoundment that no longer receives coal combustion residuals (CCR) after the effective date of the Rule and thus becomes "inactive." The answer to this question turns on our interpretation of the statutory phrase "is disposed of." My colleagues conclude that the verb "to be," when conjugated in the present tense ("is"), *unambiguously* applies to disposal that occurred entirely in the past. I disagree and accordingly concur in the judgment with respect to Section IV.B.1 of the opinion. I join all other sections of the *per curiam* opinion in full.

I.

I believe there are three tiers to the statutory question. First, RCRA directs the EPA to promulgate regulations that draw a dividing line between "sanitary landfills" and "open dumps." 42 U.S.C. §§ 6944-45. Generally speaking, a sanitary landfill is a disposal site that complies with the EPA's regulations and presents "no reasonable probability of adverse effects on health or the environment." *Id.* § 6944(a). By contrast, "any solid waste management practice or disposal of solid waste ... which constitutes the open dumping of solid waste or hazardous waste is prohibited." *Id.* § 6945(a). Second, RCRA defines an "open dump" as "any facility or site where solid waste *is disposed of* which is not a sanitary landfill which meets the criteria promulgated under [§ 6944]." *Id.* § 6903(14) (emphasis added). Third, RCRA defines "disposal" as

the discharge, deposit, injection, dumping, spilling, leaking, or placing of any solid waste or hazardous waste into or on any land or water so that such solid waste or hazardous waste or any constituent thereof may enter the environment or be emitted into the air or discharged into any waters, including ground waters.

Id. § 6903(3).

To interpret RCRA's text, we turn to the familiar two-step framework of *Chevron, U.S.A., Inc. v. Natural Resources Defense Council, Inc.*, 467 U.S. 837, 104 S.Ct. 2778, 81 L.Ed.2d 694 (1984). Thus, we begin with the statutory language and ask whether the Congress “has directly spoken to the precise question at issue.” *Id.* at 842, 104 S.Ct. 2778. If the language is plain, our inquiry ends, as we must “give effect to the unambiguously expressed intent of Congress.” *Id.* at 843, 104 S.Ct. 2778. If “the statute is silent or ambiguous with respect to the specific issue,” however, we defer to the EPA's interpretation so long as it is “based on a permissible construction of the statute.” *Id.*

We do not alter our analytical framework when the case presents a question of *451 **267 an agency's “jurisdiction” or core statutory authority. *City of Arlington v. FCC*, 569 U.S. 290, 297, 133 S.Ct. 1863, 185 L.Ed.2d 941 (2013) (“[T]he distinction between ‘jurisdictional’ and ‘nonjurisdictional’ interpretations is a mirage.”). If “the reality is that [the statute] is ambiguous,” it is our duty to declare it so and proceed to the second step of the *Chevron* analysis. *AT&T Corp. v. Iowa Utils. Bd.*, 525 U.S. 366, 395, 119 S.Ct. 721, 142 L.Ed.2d 835 (1999).

II.

I believe the text—and more precisely, the grammatical structure—of RCRA's definition of “open dump” is temporally ambiguous. See *United States v. Wilson*, 503 U.S. 329, 333, 112 S.Ct. 1351, 117 L.Ed.2d 593 (1992) (“Congress’ use of a verb tense is significant in construing statutes.”). Under RCRA, an “open dump” is a site where solid waste “is disposed of.” 42 U.S.C. § 6903(14). The operative verb is the present tense of the infinitive “to be” (“is”). The Dictionary Act tells us that “unless the context indicates otherwise ... words used in the present tense include the future as well as the present.” 1 U.S.C. § 1. By implication, therefore, the Dictionary Act “instructs that the present tense generally does not include the past.” *Carr v. United States*, 560 U.S. 438, 448, 130 S.Ct. 2229, 176 L.Ed.2d 1152 (2010). It is plain, therefore, that “is” does not mean “was.”

The verb's present tense formation takes on additional meaning because the “Congress could have phrased its requirement in language that looked to the past ... but it did not choose this readily available option.” *Gwaltney of Smithfield, Ltd. v. Chesapeake Bay Found., Inc.*, 484 U.S. 49, 57, 108 S.Ct. 376, 98 L.Ed.2d 306 (1987). It could have conjugated the infinitive “to be” in any number of ways to unambiguously include past disposal: “is or was disposed of”; “had been disposed of”; or “has been disposed of.” See CHICAGO MANUAL OF STYLE ONLINE §§ 5.118-35 (17th ed. 2017), available at [www.chicagomanualofstyle.org//home.html](http://www.chicagomanualofstyle.org/home.html) (explaining tenses generally). The Congress could also have included unambiguous temporal phrases such as: “ever”; “at any time”; “past or present”; or “beginning on a date certain.” It did not do so. The present tense of section 6903(14) therefore suggests that an “open dump” does not include any impoundment where solid waste “was disposed of.”

Significantly, the Congress used temporally unambiguous language in other RCRA provisions. For example, RCRA's “substantial endangerment” provision plainly applies to past actions; it allows a state or individual to bring suit against “any person ... *who has contributed or who is contributing to the past or present* ... disposal of any solid or hazardous waste which may present an imminent and substantial endangerment to health or the environment.” 42 U.S.C. § 6972(a)(1)(B) (emphases added). RCRA Subtitle C provides that the EPA must conduct “corrective action for all releases of hazardous waste or constituents from any solid waste management unit ... *regardless of the time at which waste was placed in such unit.*” *Id.* § 6924(u) (emphasis

added). I believe there can be no reasonable dispute that these provisions apply to past as well as present and future actions. By itself, therefore, “is” at least suggests that the EPA is *precluded* from including past acts of disposal in the definition of an “open dump.”

The ambiguity comes from the second part of the phrase: “disposed of.” A past participle like “disposed” is not singular in its purpose; it is defined as “[a] verb form indicating past or completed action or time *452 **268 that is used as a verbal adjective in phrases such as baked beans and finished work.” *Fla. Dep’t of Revenue v. Piccadilly Cafeterias, Inc.*, 554 U.S. 33, 39, 128 S.Ct. 2326, 171 L.Ed.2d 203 (2008) (quoting AMERICAN HERITAGE DICTIONARY 1287 (4th ed. 2000) (emphasis removed)). In other words, a past participle can serve either as a verb (*i.e.*, the pecans *were covered* in chocolate) or as an adjective (*i.e.*, the chocolate-*covered* pecans). Moreover, in verb form, a past participle can indicate past (*i.e.*, the pecans *were covered* in chocolate), present (*i.e.*, the pecans *are covered* in chocolate) or future action (*i.e.*, the pecans *will be covered* in chocolate). In short, there is nothing unambiguous about a past participle, at least when construed without context.²¹

²¹ My colleagues cite two authorities for their conclusion that a statutory past participle *unambiguously* signifies retroactive effect. Neither authority decides the issue. First, in *Florida Department of Revenue v. Piccadilly Cafeterias, Inc.*, 554 U.S. 33, 41, 128 S.Ct. 2326, 171 L.Ed.2d 203 (2008), the Supreme Court assumed the statute at issue was temporally ambiguous and resolved the interpretive question at *Chevron*’s second step. Moreover, in *Sherley v. Sebelius*, the majority found ambiguity in a statute that prohibited funding for “research in which a human embryo or embryos *are destroyed*.” 644 F.3d 388, 390 (D.C. Cir. 2011) (emphasis added) (internal quotation marks omitted). It did so in spite of applicable regulations defining research as “a systematic investigation, including research development, testing and evaluation, designed to develop or contribute to generalizable knowledge.” *Id.* at 394 n.* (quoting 45 C.F.R. § 46.102(d)). Notwithstanding this temporally broad definition, the majority declared that the “definition of research is flexible enough to describe either a discrete project or an extended process.” *Id.* at 394. I dissented, challenging the majority’s interpretive fallacy that “research” can be dissected into “free-standing pieces” rather than read as a “systematic [and ongoing] investigation.” *Id.* at 402-04 (Henderson, J., dissenting). Thus, I did not find the phrase “are destroyed” unambiguous standing alone; in my view, the explicit connection to research funding—and the correct definition of “research”—clarified the temporal scope of the statute to include past conduct. *Id.*

I believe “disposed of” must be read in conjunction with RCRA’s definition of “disposal,” which includes the “discharge, deposit, injection, dumping, spilling, leaking, or placing” of solid waste into certain areas. 42 U.S.C. § 6903(3). Circuit courts disagree about whether “disposal” includes the “passive migration” of contaminants, such as a slow leak from an inactive CCR impoundment. Compare *Carson Harbor Vill., Ltd. v. Unocal Corp.*, 270 F.3d 863, 867 (9th Cir. 2001) (en banc) (concluding that “the migration of contaminants on the property does not fall within the statutory definition of ‘disposal’ ”), with *Nurad, Inc. v. William E. Hooper & Sons Co.*, 966 F.2d 837, 846 (4th Cir. 1992) (holding past owners liable for “disposal” of hazardous wastes that leaked from underground storage tank notwithstanding they were not owners “at the time of disposal”). Because these cases arise in a different statutory context,²² they are not precisely on point regarding the question of the EPA’s authority to regulate inactive impoundments. Nonetheless, they illustrate the ambiguity in the statutory definition of the word “disposal”; if courts disagree about the meaning of “disposal,” that disagreement strongly suggests there is ambiguity in the words “disposed of.” See Final Rule, 80 Fed. Reg. at 21,346 (surveying caselaw interpreting “disposal”).

²² The cited cases interpret the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), which incorporates RCRA’s definition of “disposal.” 42 U.S.C. § 9601(29) (incorporating 42 U.S.C. § 6903(14)).

Although there is some temporal tension between the present tense “is” and the past participle “disposed,” it can be *453 **269 explained by statutory context. See *Brown v. Gardner*, 513 U.S. 115, 118, 115 S.Ct. 552, 130 L.Ed.2d 462 (1994) (“Ambiguity is a creature not of definitional possibilities but of statutory context.”). Industry’s entire argument hinges on three words—“is disposed of”—in the definition of “open dump.” 42 U.S.C. § 6903(14). But “open dump” is also defined by what it is not: a “sanitary landfill.” *Id.* The statutory categorization is binary: a disposal site is either a sanitary landfill or an open dump

and the EPA is directed to promulgate regulations that distinguish between the two. *Id.* § 6944. Thus, as the EPA promulgates new regulations that may shift the contours of what constitutes a “sanitary landfill,” *see* 42 U.S.C. § 6912(b) (RCRA regulations “shall be reviewed and, where necessary, revised not less frequently than every three years”), the definition of “open dump” will morph as well, *see Appalachian Voices v. McCarthy*, 989 F.Supp.2d 30, 56 (D.D.C. 2013) (“requir[ing] the EPA to submit a proposed scheduling order setting forth a proposed deadline by which it will comply with its statutory obligations” under RCRA). Although not every interpretation of “open dump” may be reasonable, *see Michigan v. EPA*, — U.S. —, 135 S.Ct. 2699, 2708, 192 L.Ed.2d 674 (2015) (“*Chevron* allows agencies to choose among competing reasonable interpretations of a statute; it does not license interpretive gerrymanders[.]”), RCRA’s mandated flexibility contemplates that the regulatory meaning of “open dump” can change over time and thus fits the definition of “ambiguity.” *See Ambiguity*, WEBSTER’S THIRD NEW INTERNATIONAL DICTIONARY 66 (3d ed. 1993) (“admitting of two or more meanings”).

III.

Although I believe the statute is temporally ambiguous, I nonetheless agree that the EPA reasonably concluded that it has the authority to regulate inactive impoundments. *See Chevron*, 467 U.S. at 843, 104 S.Ct. 2778 (deference to agency’s interpretation required so long as it is “based on a permissible construction of the statute”). In reviewing the reasonableness of an agency’s interpretation, we look to the statute’s structure and purpose as well as to precedent, *Nat’l Ass’n of Home Builders v. Defs. of Wildlife*, 551 U.S. 644, 666, 127 S.Ct. 2518, 168 L.Ed.2d 467 (2007), keeping in mind that *Chevron* “does not require the best interpretation [of the statute], only a reasonable one,” *Van Hollen, Jr. v. FEC*, 811 F.3d 486, 492 (D.C. Cir. 2016) (internal quotation marks omitted).

First, regarding the definition of “disposal,” we have *rejected* a similar “linguistic point that ‘[d]isposal ... is not a continuing activity but occurs anew each time waste is placed into or on land.’ ” *In re Consol. Land Disposal Regulation Litig.*, 938 F.2d 1386, 1389 (D.C. Cir. 1991). In doing so, we noted that RCRA’s “equation of ‘disposal’ with ‘leaking,’ which is a continuous phenomenon rather than a discrete event, is enough to blunt the sting of the petitioners’ point.” *Id.* In that case, we concluded that the petitioners’ suggested interpretation was, “at most an alternative reading of the statute, not an argument as to why the EPA’s reading of the statute is unreasonable.” *Id.* Thus, we upheld as reasonable the EPA’s interpretation of “disposal” to include “continuous” leaking; we can apply a similar reading today. Indeed, the record “demonstrates that unlined surface impoundments typically operate for 20 years before they begin to leak.” *See* 80 Fed. Reg. at 21326-27; *see also* 40 C.F.R. §§ 257.70-72 (imposing liner requirements to prevent leaking). As discussed in Section IV.B.1 of the *per curiam* opinion, the risk of leaking does not decrease in an inactive impoundment—indeed, it can increase. Because “disposal” *454 **270 includes “leaking”—and because “leaking” does not necessarily cease upon an impoundment’s closure—the EPA reasonably concluded that CCR continues to be “disposed of” even after an impoundment stops receiving CCR. *See* 75 Fed. Reg. 35,128, 35,159 (June 21, 2010) (“historical or legacy sites” pose leaking risk).

Second, an impoundment where CCR “is disposed of” is different from an impoundment that is actively receiving additional CCR. 42 U.S.C. § 6903(14). As the EPA suggests, if an individual were to stand on an impoundment dam looking out over thousands of tons of wet CCR and ask “is this an impoundment where ‘solid waste is disposed of,’ ” the answer would be “yes.” EPA Br. 22. Put differently, the disposal of CCR in an impoundment is not a discrete act. If it were, the EPA would regulate only the transfer of CCR from a power facility into an impoundment, at which point the “disposal” would end. Of course, the reality is that CCR disposal and its resulting health hazards occur over long periods of time. *See* 80 Fed. Reg. at 21,309 (“estimated time to peak potential exposures of CCR through groundwater migration to drinking water wells is 75 years” and estimated CCR unit lifespan is 40 to 80 years). CCR is not like a bag of trash that a homeowner places on the curb to be picked up. The homeowner releases control of the bag once he deposits it and the garbage truck makes its rounds. In contrast—and by definition—an impoundment owner or utility operator does not relinquish control of the CCR once it is impounded. *See* 40 C.F.R. § 257.53 (defining “owner” and “operator”); *see also id.* § 257.50(b) (Rule applies to “disposal units located off-site of the electric utility or independent power producer”). Moreover, the impoundment’s purpose is to “dispose of” CCR and, accordingly, the disposal *process* continues so long as the CCR remains in the pond. *Id.* § 257.53 (“CCR impoundment” is a

“natural topographic depression, man-made excavation, or diked area, which is *designed* to hold an accumulation of CCR and liquids, and the unit treats, stores, or disposes of CCR” (emphasis added).²³

²³ The EPA's regulatory definition of “impoundment” is consistent with the dictionary definition of the verb “impound,” which manifests continuing action. *See Impound*, WEBSTER'S THIRD NEW INTERNATIONAL DICTIONARY 1136 (3d ed. 1993) (“[T]o confine or store (water)[.]”).

For the foregoing reasons, and regarding Section IV.B.1 only, I concur in the judgment. Otherwise, I fully concur in the *per curiam* opinion.

All Citations

901 F.3d 414, 438 U.S.App.D.C. 230