

**In the United States Environmental Protection Agency**

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**Utility Solid Waste Activities Group Petition for Rulemaking to  
Reconsider Provisions of the Coal Combustion Residuals Rule, 80 Fed.  
Reg. 21,302 (April 17, 2015), and Request to Hold in Abeyance Challenge  
to Coal Combustion Residual Rule, No. 15-1219, et al. (D.C. Cir.)**

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## **RELIEF SOUGHT**

The Utility Solid Waste Activities Group<sup>1</sup> ("USWAG") hereby petitions the United States Environmental Protection Agency ("EPA") pursuant to 5 U.S.C. § 553(e) and 42 U.S.C. § 6974(a) for a rulemaking to reconsider specific provisions of the Final Rule entitled Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residuals<sup>2</sup> (the "CCR Rule," the "Final Rule," or "Rule").<sup>3</sup> USWAG is not seeking EPA's reconsideration of the entire CCR Rule, but rather only the provisions of the Rule that warrant modification, revision or repeal due to recent legislation fundamentally altering the self-implementing nature of the Rule, as well as the Administration's Executive Orders on regulatory reform.

An extension of the upcoming CCR Rule compliance deadlines is also necessary, and the EPA should take immediate action to extend those deadlines for several critically important reasons. First, owners/operators of coal combustion

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<sup>1</sup> USWAG, formed in 1978, is an association of over one hundred and twenty electric utilities, power producers, utility operating companies, and utility service companies located throughout the United States, including the Edison Electric Institute ("EEI"), the American Public Power Association ("APPA"), and the National Rural Electric Cooperative Association ("NRECA"). Together, USWAG members represent more than 73% of the total electric generating capacity of the United States, and service more than 95% of the nation's consumers of electricity and 92% of the nation's consumers of natural gas.

<sup>2</sup> 80 Fed. Reg. 21,302 (April 17, 2015).

<sup>3</sup> Section 553(e) of the Administrative Procedure Act provides that interested persons have "the right to petition for the issuance, amendment, or repeal of a rule." Similarly, section 7004 of the Resource Conservation and Recovery Act ("RCRA"), 42 U.S.C. § 6974(a), provides that "any person may petition the Administrator for the promulgation, amendment or repeal of any regulation under this chapter."

residuals (“CCR”) units are now facing decisions on whether to make large capital expenditures to comply with central requirements of the CCR Rule—requirements that will be evaluated for potential modification or replacement pursuant to this reconsideration Petition. Second, many of these requirements also may change or be implemented differently with the transition to state permit programs. Finally, an extension is necessary to ensure alignment of the CCR Rule’s requirements with EPA’s recent postponement of the compliance dates for implementation of the Final Effluent Limitations Guidelines and Standards Rule for the Steam Electric Power Generating Point Source Category<sup>4</sup> (“ELG Rule”). Coordination of the CCR and ELG Rules’ compliance time frames has been one of the overarching objectives of the Agency to ensure that owners/operators of CCR units are not forced to make decisions affecting these units under the CCR Rule without first understanding the ELG requirements.<sup>5</sup>

In addition, given that certain of the provisions of the Rule identified in this Petition for reconsideration are the subject of ongoing litigation challenging the CCR Rule,<sup>6</sup> USWAG also requests that EPA seek to hold the case in abeyance so

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<sup>4</sup> 80 Fed. Reg. 67,838 (Nov. 3, 2015).

<sup>5</sup> 80 Fed. Reg. at 21,428.

<sup>6</sup> *Utility Solid Waste Activities Group, et al. v. EPA, et al.*, No. 15-1219 (D.C. Cir.) (consolidated with Nos. 15-1221, 15-1222, 15-1223, 15-1227, 15-1228, and 15-1229) (hereinafter “CCR Litigation”).

that the Agency can reconsider its positions in the litigation in light of the recent statutory changes and Executive Orders.

## **INTRODUCTION**

EPA's CCR Rule, found at 40 C.F.R. Part 257, regulating the disposal of CCR by the electric utility sector will result in significant economic and operational impacts to coal-fired power generation. Rapidly approaching compliance deadlines for the most impactful components of the Rule are forcing owners or operators of power plants to make irreversible and tremendously significant long-term business and operational decisions regarding how to comply with the Rule. In many cases, these compliance decisions include the closure of CCR disposal units, and even the premature closure of power plants. Put simply, if there is no cost-effective option to manage CCR—the byproduct from the combustion of coal—the use of coal to produce power is significantly burdened, and the economic viability of coal-fired power plants is jeopardized. The CCR Rule is having precisely this adverse effect on coal-fired power generation across the country.

Many of the problems underlying the Rule can be solved through the use of site-specific, risk based management standards that EPA chose not to include in the Final Rule due to the Rule's underlying self-implementing regulatory scheme. But recently enacted legislation now allows the CCR Rule to be implemented

through state CCR permit programs or systems of prior approval (collectively, “state CCR permit programs”). This fundamental change, along with recently issued Executive Orders governing regulatory reform, warrants reconsideration and modification of the CCR Rule to incorporate such site-specific, risk-based provisions for assuring the proper management and disposal of CCR.

As stated above, USWAG is not seeking to eliminate or have EPA reconsider the entire CCR Rule. Indeed, USWAG strongly endorsed and supported EPA’s development of RCRA Subtitle D non-hazardous waste rules for the disposal of CCR. Importantly, however, the necessary modifications to the Rule identified in this Petition will produce a more balanced and cost-effective Rule, while also ensuring that CCR disposal units are regulated in a manner meeting RCRA’s statutory standard of ensuring “no reasonable probability of adverse effects on health or the environment.”<sup>7</sup>

We begin by providing an overview of the CCR Rule and then identify the reasons why reconsideration and modification of the Rule is necessary in light of the new legislation and to achieve the regulatory reform objectives of the Executive Orders. The Petition also identifies why it is critical for EPA promptly to extend the Rule’s upcoming compliance deadlines given that many owner/operators must make long-term strategic and operational decisions over the

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<sup>7</sup> 42 U.S.C. § 6944(a).

next few months in order to assure compliance with current CCR Rule requirements. As discussed below, we urge EPA to take action as soon as possible to extend these compliance deadlines so that these owners/operators are not left with stranded assets or undertake plant closures in order to comply with elements of the Rule that EPA appropriately determines warrant modification and/or are implemented differently under state permit programs. Finally, we identify the specific provisions of the Rule requiring modification and, given that certain of these provisions are subject to ongoing litigation challenging the CCR Rule, request that EPA seek to hold the case in abeyance while EPA reconsiders its positions in the litigation.

### **OVERVIEW OF THE CCR RULE**

The CCR Rule regulates the disposal of CCR at electric utilities as a non-hazardous solid waste under Subtitle D of RCRA. The Rule establishes minimum federal criteria for determining which CCR landfills and surface impoundments qualify as “sanitary landfills” and may continue to operate, and which landfills and surface impoundments are “open dumps” and must close. A precedent setting aspect of the Rule is EPA’s decision to apply these criteria to inactive CCR surface impoundments (*i.e.*, impoundments that ceased receiving CCR *before* the effective date of the Rule), thus resulting in the regulation of inactive CCR surface impoundments in the same manner as operating impoundments. CCR landfills and



surface impoundments that fail to meet the Rule’s criteria are considered “open dumps” subject to closure. The Rule became effective on October 19, 2015.

The major criteria in the Rule include (1) restrictions on the siting of CCR units, including the imposition of location restrictions on existing surface impoundments that have been sited and in operation for years; (2) standards for the design of CCR units, such as specified liner requirements that can effectively supersede differing state requirements; (3) operating conditions, such as mandated inspections of landfills and surface impoundments and fugitive dust controls; (4) structural integrity requirements for surface impoundments that, if not met by a specified time period, mandate the prompt closure of the unit; (5) groundwater monitoring and corrective action requirements, which include the establishment of groundwater protection standards that, in the case of certain constituents, are set at background levels—even though these levels can be far lower than established and accepted risk-based levels; (6) two specified closure options, including (i) closure with CCR in place in conformance with specified dewatering, stabilization and cap design standards, followed by a minimum of 30-years of post-closure care and groundwater monitoring, or (ii) closure by removing the CCR from the unit and certifying compliance with the mandated groundwater protection standards, with no subsequent post-closure care; and (7) recordkeeping and reporting requirements

demonstrating compliance with the criteria that must be posted to a publicly available website.

Because the Rule was promulgated as a self-implementing rule, whether in fact a facility is in compliance with the above-referenced criteria is determined by a Qualified Professional Engineer (“QPE”), whose certifications are posted to the facility’s publicly available website. The QPE’s certification is then subject to review by EPA, the states, and citizen groups and, if there is disagreement, the facility’s compliance with the Rule can be challenged by EPA through an EPA administrative enforcement order<sup>8</sup> or through a RCRA citizen suit brought by a citizen group or a state in federal district court.<sup>9</sup> This unorthodox enforcement scheme has led to a degree of uncertainty, as QPE certifications are subject to challenge and possible reversal *after* the certification is made and the applicable regulatory deadline has passed.

Moreover, failure to comply with certain of the Rule’s criteria leads to the mandated closure of the CCR disposal unit within very short time frames. Of most importance, the detection of a release to groundwater from an unlined surface impoundment above a mandated groundwater protection standard—even where the

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<sup>8</sup> When the Rule was originally promulgated in April 2015, EPA did not have statutory authority to enforce the Rule. However, the recently enacted Water Infrastructure Improvements for the Nation Act (“WIIN Act”), which, in part, amended Subtitle D of RCRA to authorize the states to implement the CCR Rule through state permit programs, also gave EPA authority to directly enforce the Rule.

<sup>9</sup> *See* 42 U.S.C. § 6972.

groundwater protection standard is background and far below accepted health-based levels—requires the prompt closure of the impoundment even if other corrective action measures may be available at considerably less cost for ensuring the protection of human health and the environment based on site-specific circumstances.

Certain of the Rule’s criteria have already taken effect, including fugitive dust controls, unit inspections and the preparation of closure plans. However, the Rule’s most demanding and onerous requirements (including in particular its groundwater monitoring requirements, with the attendant regulatory ramifications of forced closures of CCR disposal units and corrective action) are scheduled to go into effect on October 17, 2017, approximately five months from the filing of this Petition.

### **REASONS TO RECONSIDER THE RULE**

#### **A. The Self-Implementing Nature of the CCR Rule Results in Inflexible Requirements that Impose Tremendous Costs on Regulated Entities.**

The enormous costs associated with the CCR Rule are largely attributable to the Rule’s burdensome, inflexible, and often impracticable requirements, which do not allow for the type of site-specific, risk-based management techniques contained in many state coal ash regulatory programs and other federal solid waste regulations. Instead, the CCR Rule operates independently of existing state risk-

based CCR control programs.<sup>10</sup> Therefore, owners/operators of coal-fired power plants must often comply with two sets of CCR disposal controls: those imposed by the CCR Rule and any additional state requirements.<sup>11</sup>

This dual and inefficient regulatory regime is the result of the self-implementing nature of the CCR Rule. At the time the CCR Rule was promulgated in 2015, the underlying statute, RCRA, did not allow for the Rule to be delegated to the states or to be implemented through state or federal permit programs. Instead, as explained above, regulated entities are responsible for “self-implementing” the Rule, meaning that owners/operators of coal-fired power plants must ascertain for themselves what is required to comply with the Rule and then certify such compliance on a publicly available website. Alleged non-compliance with the Rule is enforced through RCRA’s citizen suit provision or directly by EPA through the issuance of administrative orders.

Because of this self-implementing scheme, EPA declined to include in the Final Rule many site-specific, risk-based provisions contained in other state and federal solid waste programs, and instead created a monolithic, one-size-fits-all regulatory regime. For example, EPA removed certain provisions from the Final Rule—provisions which were contained in the 2010 CCR proposal<sup>12</sup> and drawn

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<sup>10</sup> 80 Fed. Reg. at 21,333.

<sup>11</sup> *Id.*

<sup>12</sup> 75 Fed. Reg. 35,128 (June 21, 2010).

from EPA’s Municipal Solid Waste Landfills (“MSWLF”) program under 40 C.F.R. Part 258—that would have allowed for tailoring of the Rule’s groundwater monitoring and corrective action programs based on site-specific conditions. EPA removed this flexibility precisely because there is no regulatory authority overseeing implementation of the CCR Rule through an enforceable permit program. As EPA reasoned, “the possibility that a state may lack a permit program for CCR units made it impossible to include some of the alternatives available in [the MSWLF program], which establish alternative standards that allow a state, as part of its permit program to tailor the default requirements to account for site specific conditions at the individual facility.”<sup>13</sup>

This has resulted in a CCR Rule reflecting risk assumptions and regulatory criteria based on the “lowest common denominator.” EPA readily acknowledged this point when it determined that any unlined impoundment contaminating groundwater must, in all circumstances, close:

EPA acknowledges that it may be possible at certain sites to engineer an alternative to closure of the unit that would adequately control the source of the contamination and would otherwise protect human health and the environment. However, the efficacy of those engineering solutions will necessarily be determined by individual site conditions. As previously discussed, the regulatory structure under which this rule is issued effectively limits the Agency’s ability to develop the type of requirements that can be individually tailored to accommodate particular site conditions. Under [RCRA] sections

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<sup>13</sup> 80 Fed. Reg. at 21,396-97.

1008(a) and 4004(a), EPA must establish national criteria that will operate effectively in the absence of any guaranteed regulatory oversight (i.e., a permitting program), to achieve the statutory standard of “no reasonable probability of adverse effects on health or the environment” at all sites subject to the standards.<sup>14</sup>

This lack of site-specific consideration has resulted in an inflexible and overly-conservative Rule that is imposing tremendous operational costs on the power industry and is threatening the premature closure of CCR disposal units. As explained below, however, the statutory structure underpinning the enforcement scheme for the Rule has fundamentally changed since its promulgation in 2015. Therefore, there is no longer any basis for the Rule’s inflexible requirements, which, as noted above, even EPA acknowledges can force the closure of units that are otherwise capable of remaining open in a manner that protects human health and the environment. Furthermore, these inflexible requirements are the exact types of unnecessarily burdensome regulation that EPA has been directed to repeal, replace, or modify under the recent Executive Orders relating to regulatory reform.

**B. By Authorizing State CCR Permit Programs, the WIIN Act Fundamentally Altered the CCR Rule’s Enforcement Scheme.**

On December 16, 2016, President Obama signed into law the Water Infrastructure Improvements for the Nation Act (“WIIN Act”), which, in part, amended Subtitle D of RCRA to authorize the states to implement the CCR Rule

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<sup>14</sup> *Id.* at 21,371.

through state permit programs.<sup>15</sup> Specifically, the WIIN Act authorizes the states to submit an application requesting EPA’s approval to administer the CCR Rule through a state permit program *in lieu of* the self-implementing CCR Rule. Where states do not seek to administer the Rule or where a state’s application is denied by EPA—referred to as “Nonparticipating States”—EPA is directed to implement the CCR Rule through a federal permit program.<sup>16</sup> This statutory change fundamentally transforms the CCR Rule from a self-implementing program, into a rule that will be implemented through either a state or EPA permit program (much like traditional federal environmental programs).

With the WIIN Act’s change to the implementation of the CCR Rule, EPA’s original rationale for excluding the site-specific, risk-based tailoring provisions from the Final Rule—its concern for “abuse” by entities operating under the self-implementing regime—no longer exists. Therefore, the Rule should be amended as soon as possible to incorporate the risk-based management options contained in state and other EPA solid waste programs, eliminating the burdensome one-size-fits-all approach of the current Rule.

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<sup>15</sup> The legislation amends section 4005 in Subtitle D of RCRA (“Upgrading of Open Dumps”) by adding a new subsection (d) to the section entitled “State Programs for Control of Coal Combustion Residuals.”

<sup>16</sup> The requirement that EPA implement a CCR permit program in a Nonparticipating State is conditioned on Congress appropriating funds for EPA to administer a CCR permit program. Nonetheless, even without such direct appropriations, nothing in the statute prohibits EPA from administering CCR permit programs in Nonparticipating States if it so chooses.

### **C. The Policies Established by Executive Orders on Regulatory Reform Support Modification of the CCR Rule.**

In addition to the WIIN Act, the Rule requires reconsideration pursuant to the policies set forth in the Administration’s recent series of Executive Orders regarding regulatory reform, including the regulatory reform agenda set forth in Executive Order 13777 (“EO 13777”).<sup>17</sup> Reconsideration of the Rule also is consistent with the policies expressed in the President’s Executive Order 13771 on “Reducing Regulation and Controlling Regulatory Costs”<sup>18</sup> (“EO 13771”) and the President’s Executive Order 13783 on “Promoting Energy Independence and Economic Growth”<sup>19</sup> (“EO 13783”). We discuss these EOs below and explain why individually, and collectively, they warrant modification to the CCR Rule.

#### **1. EO 13777**

One of the key directives in EO 13777 is for agency regulatory reform task forces (“RRTFs”) to “evaluate existing regulations and make recommendations to the agency head regarding their repeal, replacement, or modification, consistent

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<sup>17</sup> See Executive Order 13777, *Enforcing the Regulatory Reform Agenda* (Feb. 24, 2017), 82 Fed. Reg. 12,285 (Mar. 1, 2017).

<sup>18</sup> Executive Order 13771, *Reducing Regulation and Controlling Regulatory Costs* (Jan. 30, 2017), 82 Fed. Reg. 19339 (Feb. 3, 2017).

<sup>19</sup> Executive Order 13783, *Promoting Energy Independence and Economic Growth* (Mar. 28, 2017), 82 Fed. Reg. 16,093 (Mar. 31, 2017).



with applicable law.”<sup>20</sup> The RRTFs have until May 25, 2017, to make their recommendations.<sup>21</sup>

In undertaking this task, EO 13777 directs that the RRTF shall attempt to identify regulations that, among other things:

- (i) eliminate jobs or inhibit job creation;
- (ii) are outdated, unnecessary, or ineffective;
- (iii) impose costs that exceed benefits; or
- (iv) create a serious inconsistency or otherwise interfere with regulatory reform initiatives and policies.<sup>22</sup>

The CCR Rule meets *all* of these criteria.

First, EPA itself readily acknowledged in issuing the Final Rule that the Rule’s costs far exceed its benefits, with annual costs conservatively exceeding the Rule’s benefits by a range of at least \$273 to \$441 million per year.<sup>23</sup> Even these ranges far underestimate the gaps between the Rule’s compliance costs versus its estimated benefits because they fail to take into account the excessive

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<sup>20</sup> EO 13777 § 4. EO 13777 refers to the definition of “regulation” or “rule” found in EO 13771, which includes, in pertinent part, “an agency statement of general or particular applicability and future effect designed to implement, interpret, or prescribe law or policy or to describe the procedure or practice requirements of an agency . . . .” EO 13771 § 4.

<sup>21</sup> By imposing a rigorous deadline on the Task Force, EO 13777 recognizes the urgency of addressing overly burdensome regulations. Ultimately, it is the customers of the electric utility industry who suffer the economic burden of exorbitantly expensive rules having no concomitant environmental benefit. This burden is exacerbated when important issues regarding those rules go unresolved for extended periods of time (*e.g.*, the Mercury and Air Toxics rule) and, as a result, the regulated must move forward with burdensome regulations before they can be repealed or revised. Uncertainty also contributes to potential instability in energy delivery. Thus, in the spirit of EO 13777, the Agency should move expeditiously to reconsider and revise the Rule.

<sup>22</sup> EO 13777 § 3(d)(i)-(iv).

<sup>23</sup> 80 Fed. Reg. at 21,460.

compliance costs brought about by the Rule's overly stringent one-size-fits-all operating, groundwater monitoring and corrective action standards that cannot be tailored to reflect site-specific characteristics of a particular unit. Consistent with EO 13777, a rule whose costs exceeds its benefits should be re-evaluated and modified.

The Rule also will cause job losses due to the premature closure of power plants caused by the forced closure of CCR disposal units. Similarly, the provisions of the Rule identified for reconsideration in this Petition are outdated and unnecessary, as they fail to reflect the fundamental statutory change brought about by the WIIN Act with respect to the implementation of the Rule through enforceable permit programs in lieu of the original self-implementing regime. Finally, as discussed below, the adverse effects on coal-powered energy generation caused by the Rule's current implementation scheme and overly burdensome regulatory regime are directly inconsistent, with EO 13783.

For all these reasons, the CCR Rule should be chief among the EPA RRTF's recommendations under EO 13777 for repeal, replacement or modification as set forth in this Petition.

## **2. EO 13771**

The CCR Rule also should be reconsidered as part of EPA's compliance with EO 13771. Among other things, EO 13771 directs that "for every one new

regulation issued, at least two prior regulations be identified for elimination, and that the cost of planned regulations be prudently managed and controlled through the budgeting process.”<sup>24</sup> Agencies are to achieve a net incremental regulatory cost of zero in Fiscal 2017<sup>25</sup> by offsetting the costs of new regulations during the current fiscal year with costs eliminated from existing regulations.<sup>26</sup>

By reconsidering the CCR Rule and taking its costs properly into account when promulgating a modified CCR Rule, EPA can engage in regulatory burden reduction as contemplated by EO 13771, thereby facilitating the promulgation of other rules, including a revised CCR Rule that provides meaningful environmental benefits.

### **3. EO 13783**

EO 13783 provides even further support for the requested modifications to the CCR Rule identified in this Petition. EO 13783 states, in pertinent part, that it is the national policy of the United States and executive agencies to “immediately review existing regulations that potentially burden the . . . use of domestically produced energy resources and appropriately *suspend, revise, or rescind* those that

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<sup>24</sup> EO 13771 § 1.

<sup>25</sup> "For fiscal year 2017, which is in progress, the heads of all agencies are directed that the total incremental cost of all new regulations, including repealed regulations, to be finalized this year shall be no greater than zero. . . ." *Id.* § 2(b).

<sup>26</sup> *Id.* § 2(c) ("incremental costs associated with new regulations shall, to the extent permitted by law, be offset by the elimination of existing costs associated with at least two prior regulations.").

unduly burden the development of domestic energy resources beyond the degree necessary to protect the public interest or otherwise comply with law.”<sup>27</sup> To achieve this national policy objective, EO 13783 directs that heads of federal agencies immediately “review all existing regulations, orders, guidance documents, policies, and any other similar agency actions (collectively, agency actions) that potentially burden the development or use of domestically produced energy resources, with particular attention to oil, natural gas, *coal*, and nuclear energy resources.”<sup>28</sup>

Pursuant to the above directives, within 180 days of the issuance of EO 13783, the heads of federal agencies are to submit final reports to the Vice President and Director of the Office of Management and Budget (among others) detailing the regulations identified by the agency as potentially burdening the development or use of domestically produced energy resources, including with particular attention to *coal*, oil, natural gas and nuclear energy resources. After submission of these final reports, the heads of federal agencies “shall as soon as practicable, suspend, revise, or rescind, or publish for notice and comment proposed rules suspending, revising, or rescinding, those actions, as appropriate and consistent with law.”<sup>29</sup>

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<sup>27</sup> EO 13783 § 1(c) (emphasis added).

<sup>28</sup> *Id.* at § 2(a) (emphasis added).

<sup>29</sup> *Id.* at § (g). Agencies are directed to coordinate such regulatory reform with their activities undertaken pursuant to EO 13771, discussed above. *Id.*

The CCR Rule is an “agency action” that directly burdens the use of coal as an energy resource by imposing unduly stringent and extremely costly regulations on the management of CCR—a coal combustion byproduct. Put simply, the continued use of coal for electricity generation is effectively precluded if there is no economical option for managing the residuals from its use. These burdens are only compounded by a suite of other major rules affecting coal-fired power plants. And, ultimately, the costs imposed by these regulations will be borne by consumers of the electricity.

Therefore, as currently written and implemented, the CCR Rule is having significant adverse effects on the domestic use of coal as an energy source in direct contradiction of the national energy policy set forth in EO 13783. This does not have to be the case. The identified revisions, and in certain cases repeal, of the specific provisions of the CCR Rule discussed below will remove these unwarranted regulatory burdens on the management of CCR and the related burdens on the use of coal as an energy source—none of which are mandated by the statute. Rather, with the enactment of a new regulatory paradigm allowing for implementation through CCR permit programs, EPA can move from a monolithic, one-size-fits-all regulatory regime to a site-specific and risk-based approach, all while continuing to ensure that CCR will be managed in a manner meeting

RCRA’s Subtitle D standard of ensuring “no reasonable probability of adverse effects on health or the environment.”<sup>30</sup>

Therefore, it is appropriate for the CCR Rule to be included in the final report prepared under EO 13783 and then revised as soon as practicable consistent with the request for reconsideration set forth in this Petition.

### **NEED TO EXTEND CCR RULE COMPLIANCE DEADLINES**

Although certain of the CCR Rule’s operating criteria have already taken effect, other provisions of the CCR Rule, including the Rule’s groundwater monitoring and associated corrective action provisions, have not. As discussed in more detail below, it is critically important to extend the compliance dates of these remaining CCR Rule requirements so that electric utilities do not make irreversible operational and significant investment decisions (including decisions on plant closures) before EPA has time to reconsider the provisions of the Rule identified in this Petition and make any necessary Rule modifications. In addition, an extension of the Rule’s upcoming timeframes is necessary to allow time for implementation of the Rule through enforceable permit programs as contemplated under the WIIN Act and, equally important, to ensure alignment of the CCR Rule’s remaining compliance dates with the ELG Rule, which was recently stayed while EPA reconsiders many of the key requirements of that rule.

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<sup>30</sup> 42 U.S.C. § 6944(a).

**A. Extension of CCR Rule Deadlines is Necessary to Allow Time to Transition to State Permit Programs and Undertake the Necessary Substantive Changes to the Rule.**

Given the anticipated implementation of the Rule through state permit programs—including the adoption of requirements that may differ, yet be equally protective as the federal Rule—EPA should take immediate action to extend the CCR Rule’s upcoming compliance deadlines to coincide with implementation of the Rule through CCR permit programs. This is necessary to allow time for the transition of the Rule to state-based permit programs, under which elements of the Rule, including the groundwater monitoring program, can be tailored to reflect the site-specific characteristics of individual CCR units. Similarly, an extension of time is necessary for EPA to evaluate the requested modifications to the CCR Rule identified in this Petition and to undertake rulemakings to implement those changes, many of which will likely be reflected in state CCR permit programs. As discussed below, these changes will allow for implementation of the Rule’s requirements in a more balanced and cost-effective manner while meeting RCRA’s statutory standard of ensuring “no reasonable probability of adverse effects on health or the environment.”<sup>31</sup>

Indeed, we understand that EPA is in the process of preparing guidance detailing the procedures states should use to apply for and receive approval to

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<sup>31</sup> 42 U.S.C. § 6944(a).

implement the CCR Rule through state permit programs.<sup>32</sup> Many states, including Missouri, Georgia and Kansas, have reportedly already expressed an interest in obtaining or are already seeking EPA approval to administer such programs. Therefore, it is expected that many states will be in the position to implement the requirements of the CCR Rule through state permit programs in the near future, perhaps before the end of this year, with more states to follow later.

This transition to state permit programs necessitates an extension of the Rule's deadlines to avoid large-scale capital expenditures by the regulated community for elements of the Rule that are likely to be changed significantly through the reconsideration Petition or at least implemented differently under future permits. Electric utilities should not be forced to invest significant and irretrievable capital resources to comply with requirements that are likely to change.

Chief among these deadlines is the fast approaching October 17, 2017 requirement for initiating the Rule's groundwater monitoring program,<sup>33</sup> which sets off a series of cascading requirements, including possibly onerous corrective action requirements and, in some cases, forced closure of CCR units and power

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<sup>32</sup> See letter dated April 28, 2017 from Administrator Pruitt to Governor Sandoval of Nevada.

<sup>33</sup> 40 C.F.R. §§ 257.90(b), 257.90(e).



plants.<sup>34</sup> As currently written, the Rule’s groundwater monitoring program does not allow for the consideration of any site-specific characteristics, such as groundwater hydrology, local geological characteristics, or proximity to surface water and drinking water receptors. But, now, state regulators will be in a position to tailor, as appropriate, the applicable groundwater standards to reflect the risks and groundwater characteristics of individual sites. Extending the Rule’s groundwater monitoring program to coincide with the adoption and implementation of the Rule through state permit programs will avoid needless capital expenditures, the likely closure of CCR units, and perhaps even the premature closure of power plants, for elements of the Rule that may change as a result of the reconsideration rulemaking or be implemented differently under state CCR permit programs.

**B. Extension of CCR Rule Deadlines is Necessary to Allow for Coordination with ELG Rule.**

An extension of the Rule’s compliance deadlines also is critical to ensure coordination with the time frames in the ELG Rule. Significantly, EPA recently

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<sup>34</sup> *See id.* §§ 257.90-.98; *see also* 80 Fed. Reg. at 21,397 (discussing the “phased approach” to groundwater monitoring).

granted two petitions for reconsideration<sup>35</sup> of the ELG Rule.<sup>36</sup> As part of this reconsideration, EPA has postponed the compliance deadlines in the ELG Rule through an administrative stay and announced its plan to extend or revise the ELG compliance deadlines through a subsequent notice and comment rulemaking over the next few months.<sup>37</sup>

Although the ELG Rule and the CCR Rule are separate regulations issued pursuant to two separate statutes, both rules impact the management of CCR waste streams and the operation of CCR surface impoundments. Because of this, EPA correctly reasoned in promulgating the CCR Rule that it was necessary to align the structure and timelines of the CCR Rule to account for the content and timelines of the ELG Rule. Therefore, in establishing the compliance time frames in the CCR Rule, EPA “accounted for other Agency rulemakings that may affect owners or operators of CCR units,” including specifically the ELG Rule.<sup>38</sup> EPA also explained that “effective coordination of any final RCRA requirements with the ELG requirements would be sought in order to minimize the overall complexity of

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<sup>35</sup> Petition to reconsider the Final Rule, submitted by U.S. Small Business Administration (April 5, 2017); Petition to reconsider the Final Rule, submitted by Utility Water Act Group (March 24, 2017) (available at <https://www.epa.gov/eg/steam-electric-power-generating-effluent-guidelines-petitions-reconsideration>).

<sup>36</sup> April 12, 2017 Letter from EPA Administrator Scott Pruitt to Harry M. Johnson, Major Clark, and Kevin Bromberg (available at [https://www.epa.gov/sites/production/files/2017-04/documents/steam-electric-elg\\_uwag-sba-petition\\_epa-response\\_04-12-2017.pdf](https://www.epa.gov/sites/production/files/2017-04/documents/steam-electric-elg_uwag-sba-petition_epa-response_04-12-2017.pdf)).

<sup>37</sup> 82 Fed. Reg. 19,005 (April 25, 2017).

<sup>38</sup> *Id.*

the two regulatory structures, and facilitate implementation of engineering, financial, and permitting activities.”<sup>39</sup>

Accordingly, the compliance deadlines in the CCR Rule were established by EPA with the full expectation that the contents and timing of the final ELG Rule would be understood by owners or operators of CCR units.<sup>40</sup> This was so that the CCR Rule would not force any major operational decisions (such as closure or retrofit of a CCR unit) before an owner or operator of a CCR unit could properly take into account and consider the associated implications under the ELG Rule, allowing “ample time for the owners and operators of CCR units to *understand the requirements of both regulations* and make the appropriate business decisions.”<sup>41</sup> EPA recognized this was particularly true with respect to CCR Rule obligations that could require a surface impoundment to undergo closure or retrofit, explaining that “[a] decision on what action to take with that unit may ultimately be directly influenced by the requirements of the ELG rule.”<sup>42</sup>

Consistent with the above position, EPA stated that the CCR Rule “will *not* require owners or operators of CCR units to make decisions about these units

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<sup>39</sup> 80 Fed. Reg. at 21,313.

<sup>40</sup> *See id.* at 21,428 (“Thus, under the final timeframes in this [CCR] rule, any such decision [whether to retrofit a CCR impoundment] will not have to be made by the owner or operator of a CCR unit until well after the ELG rule is final and the regulatory requirements are well understood.”).

<sup>41</sup> *Id.* (emphasis added).

<sup>42</sup> *Id.*

[including closure decisions] without first understanding the implications that such decisions would have meeting the requirements of [the ELG].”<sup>43</sup> Obviously, however, owners or operators of CCR units are not in a position to make this type of informed decision given EPA’s recent decision to reconsider the content and compliance time frames of the ELG Rule.

For example, a decision on whether to undertake the significant capital investment to retrofit a CCR surface impoundment otherwise required to close under the CCR Rule will turn in large part on whether that impoundment will continue to serve a wastewater management function for an ELG-regulated waste stream—such as bottom ash transport water. But the future role of that impoundment in managing bottom ash transport water under the ELG Rule will not be known until such time as EPA completes its reconsideration of both the timing and content of the ELG Rule. This is precisely the type of predicament that EPA intended to avoid by declaring that it would not force any major compliance decisions under the CCR Rule before a facility could properly take into account and consider the associated implications under the ELG Rule.

In short, because the ELG and CCR Rules were designed to work in tandem, both with respect to content and timing, it is clear that EPA must now also extend the upcoming compliance deadlines in the CCR Rule to coincide with revised

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<sup>43</sup> *Id.* (emphasis added).

compliance deadlines in the ELG Rule. For similar reasons, other CCR Rule deadlines that should be extended include the time schedules in 40 C.F.R. §§ 257.60-257.64 for assessing compliance with the CCR Rule's location restrictions.

### **PROVISIONS FOR RECONSIDERATION**

As discussed above, in light of the President's Regulatory Reform Orders and the fundamental statutory change brought about by the WIIN Act, EPA should reconsider and modify the provisions of the CCR Rule identified below. Because the CCR Rule can now be implemented through state permit programs, EPA's rationale for not including many of the risk-based provisions contained in the proposed CCR Rule, and currently contained in many existing state CCR permit programs, no longer exists. Many of the recommended provisions for reconsideration discussed below reflect this fundamental statutory change in how the Rule is to be implemented and, accordingly, urge modifications incorporating common sense, risk-based management options into the Rule. In addition, the CCR Rule contains other overly prescriptive requirements that impose unnecessary regulatory burdens on the electric power sector and increase compliance costs without a corresponding environmental benefit. As discussed below, it is appropriate for EPA also to revise these requirements pursuant to the Administration's Executive Orders relating to regulatory reform.

## **A. Alternative Risk-Based Groundwater Protection Standards**

The Rule's groundwater monitoring regime and corrective action requirements are centered around specified groundwater protection standards for the Rule's list of Appendix IV constituents. For most constituents, the groundwater protection standard is based on maximum contaminant levels ("MCLs"), which are standards set by EPA for drinking water quality. Several Appendix IV constituents (molybdenum, lead, cobalt, and lithium), however, do not have an MCL. For these constituents, the groundwater protection standard defaults to background levels.

In the 2010 proposal, EPA included a provision allowing for the establishment of alternative risk-based groundwater protection standards for Appendix IV constituents that do not have an MCL.<sup>44</sup> This has long been the regulatory regime in the MSWLF program and has not been the subject of any controversy.<sup>45</sup> Even under EPA's Subtitle C hazardous waste program, permit writers are authorized to establish site-specific groundwater protection standards based on the unique conditions of the regulated unit.<sup>46</sup> EPA removed this option from the Final Rule, however, explaining that such flexibility was "inappropriate in a self-implementing rule, as it was unlikely that a facility would have the

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<sup>44</sup> 75 Fed. Reg. at 35,249 (proposed 40 C.F.R. § 257.95(h)).

<sup>45</sup> See 40 C.F.R. § 258.55(h)(3)(i).

<sup>46</sup> See *Id.* § 264.94(b).

scientific expertise necessary to conduct a risk assessment, and was too susceptible to potential abuse.”<sup>47</sup>

By prohibiting risk-based groundwater protection standards, the Rule mandates the use of background levels even when those levels are far below any risk-based standard that would otherwise be required by a state or even by EPA under other federal cleanup programs (where risk-based remediation levels are routinely used). This means that a facility may be forced into the Rule’s burdensome corrective action program, even if contamination at the facility does not exceed an acceptable risk-based level. And, more importantly, the ultimate cleanup standard under corrective action in these circumstances is set at background, even if the treatment required is far more costly than treating to an acceptable risk-based level. This overly prescriptive and conservative approach thus imposes compliance costs that far exceed any environmental benefit and is the type of regulation targeted for regulatory reform under the Executive Orders.

The Appendix IV constituent cobalt is a good example of the illogical result compelled by the Rule’s inflexible approach. As explained in the attached report prepared by Gradient Corporation (Appendix A), EPA has established a risk-based level for cobalt—referred to as a “Regional Screening Level” or “RSL”—of 6 ug/L in groundwater. However, the median background level of cobalt in groundwater

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<sup>47</sup> 80 Fed. Reg. at 21,405.

is 0.17 ug/L, which is *35 times lower* than the RSL developed for cobalt by EPA. And, the median concentration of cobalt in CCR leachate is 1 ug/L, which is *six times lower* than the health-based standard for cobalt established by EPA. Therefore, at the vast majority of CCR facilities, no remediation would ever be required to achieve the health-based benchmarks for cobalt in order to protect human health and the environment.

But this is not how the CCR Rule works. Instead, because cobalt does not have an MCL and facilities are not allowed to set the groundwater protection standard at an acceptable risk-based level, facilities would have to meet the groundwater protection standard of 0.17 ug/L,<sup>48</sup> even though that standard is *35 times lower* than EPA's own risk-based standard. Therefore, facilities that contain the median CCR leachate concentration of 1 ug/L, which itself is six times lower than EPA's risk-based level for cobalt, would still have to spend hundreds of thousands of dollars (if not more) in groundwater remediation costs to achieve a typical (median) cobalt background level of 0.17 ug/L.<sup>49</sup>

And, worse, in the case of unlined CCR surface impoundments, exceedance of a groundwater protection standard results in the mandated cessation of receipt of

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<sup>48</sup> This assumes that background is the 0.17 ug/L, the median concentration of cobalt in groundwater.

<sup>49</sup> In contrast, MSWLFs that receive CCR for disposal would be allowed to use risk-based groundwater protection standards under 40 C.F.R. Part 258, since MSWLFs that receive CCR are not regulated under the CCR Rule. *See* 40 C.F.R. § 257.50(i).



CCR within six month and the commencement of closure of the unit. This huge expenditure of time and resources, combined with the forced closure of surface impoundments in circumstances where a groundwater protection standard is below health-based levels and/or requires more treatment than otherwise necessary, provides no incremental benefit to human health and the environment.

There is absolutely no reason for this type of expenditure of resources under the CCR Rule to continue. First, such an outcome is in direct contravention of EO 13777's direction to identify and revise and/or rescind those regulations whose costs exceed their benefits. Second, now that states and EPA can implement the CCR Rule through enforceable permit programs, states and EPA can readily adopt risk-based groundwater protection standards in lieu of the Rule's overly-conservative requirement to default to background levels. EPA should therefore revise the CCR Rule to allow for the use of alternative risk-based standards in establishing groundwater protection standards for Appendix IV constituents that do not have an MCL.<sup>50</sup> This provision should be added to the Final Rule at 40 C.F.R. § 257.95(h).

#### **B. Modification to Corrective Action Remedy**

The 2010 proposal included a provision, again modeled after the MSWLF program, allowing a facility to determine that undertaking corrective action was

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<sup>50</sup> See 75 Fed. Reg. at 35,249-50 (proposed 40 C.F.R. § 257.95(h)).

not necessary if it would not result in any meaningful environmental benefit (*e.g.*, where the groundwater is not a source of drinking water and there is a low likelihood of contamination migrating offsite).<sup>51</sup> The proposal also allowed facilities, when deciding on the appropriate remedy, to take into account “the desirability of utilizing technologies that are not currently available, but which may offer significant advantages over already available technologies in terms of effectiveness, reliability, safety, or ability to achieve remedial objectives.”<sup>52</sup> Both of these concepts have long been included in EPA’s MSWLF program, as state permit writers are well qualified to oversee any risk-based decisions made by a facility when evaluating corrective action options.<sup>53</sup> Both of these provisions, however, were removed from the Final Rule on the basis that such provisions were “potentially subject to abuse” and not appropriate where there is no state oversight.<sup>54</sup>

With the ability to implement the CCR Rule through state or EPA permit programs, EPA’s concern for “abuse” by individual facilities no longer exists and permit writers should be authorized to tailor corrective action to the individual characteristics of the site. This allowance will achieve burden reduction by allowing for the use of the most efficient remediation technologies and/or avoiding

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<sup>51</sup> *Id.* at 35,251 (proposed 40 C.F.R. § 257.97(e)-(f)).

<sup>52</sup> *Id.* (proposed 40 C.F.R. § 257.97(d)(4)).

<sup>53</sup> *See* 40 C.F.R. §§ 258.57(d)(4), 257.57(e).

<sup>54</sup> 80 Fed. Reg. at 21,407.

the implementation of corrective action measures that provide no meaningful environmental benefit. Therefore, the above-referenced provisions should be added to 40 C.F.R. § 257.97 to reduce unnecessary regulatory burdens.

**C. Allowance for Alternative Points of Compliance and Site-Specific Groundwater Monitoring Constituents**

The Final Rule does not allow facilities flexibility to utilize site-specific conditions to determine the appropriate point of compliance for groundwater. Nor does the Rule allow for site-specific modifications to the list of constituents subject to groundwater monitoring. Instead, the Rule requires in all circumstances that the point of compliance be at the edge of the CCR unit—even where this makes little practical sense—and mandates that all constituents in Appendix III and IV be monitored.<sup>55</sup>

Many comments on the 2010 proposal requested that EPA provide facilities the option to determine the appropriate point of compliance for the groundwater monitoring system based on site-specific conditions.<sup>56</sup> In particular, based on the option included in the MSWLF regulations,<sup>57</sup> commenters requested that the CCR Rule allow for a point of compliance that is no more than 150 meters from the waste management unit boundary and located on land owned by the owner of the CCR unit, taking into account site-specific factors. Commenters also requested,

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<sup>55</sup> See 40 C.F.R. §§ 257.91(a)(2), 257.94(a).

<sup>56</sup> See 80 Fed. Reg. at 21,397-98.

<sup>57</sup> 40 C.F.R. § 258.40(d)

again based on the MSWLF program, that a facility be able to tailor the constituents subject to groundwater monitoring based on site-specific conditions (for example, if a modified list of parameters provided for a reliable indicator of potential releases from the unit). EPA rejected both of these suggestions in the Final Rule, however, explaining that “in the absence of a mandated state oversight mechanism to ensure that the suggested modifications are technically appropriate, these kinds of provisions can operate at the expense of protectiveness.”<sup>58</sup>

With the ability of the states and EPA to implement the Rule through site-specific permit programs properly administered by a regulatory authority, this concern no longer exists. Therefore, the Rule should be revised to include the provisions already in the MSWLF program providing a permitting authority (1) the option to determine the appropriate point of compliance for the groundwater monitoring system based on site-specific conditions, and (2) the ability to tailor the constituents subject to groundwater monitoring based on site-specific conditions. This will achieve burden reduction by allowing permit writers to determine, based on site-specific characteristics such as groundwater hydrology, local geological characteristics, and proximity to surface water and drinking water receptors, the most efficient placement of monitoring wells and to avoid monitoring for specific constituents that are not of concern or relevant to the site. These provisions should

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<sup>58</sup> 80 Fed. Reg. at 21,398.

be added to 40 C.F.R. § 257.91, § 257.94, and § 257.95, respectively, in order to reduce unnecessary regulatory burdens.

**D. Ability of Unlined CCR Surface Impoundments to Operate While Undertaking Corrective Action**

Under the CCR Rule, an unlined surface impoundment that triggers corrective action—*i.e.*, detects a statistically significant increase over an applicable groundwater protection standard—*must* cease the receipt of CCR within 6 months and commence closure with *no* opportunity to continue operation of the CCR unit by taking corrective action to remedy the release through engineering controls.<sup>59</sup> Importantly, though, EPA acknowledged “that it may be possible at certain sites to engineer an alternative to closure of the unit that would adequately control the source of contamination and would otherwise protect human health and the environment.”<sup>60</sup> Nonetheless, EPA declined to allow facilities to pursue this option, explaining that “the efficacy of those engineering solutions will necessarily be determined by individual site conditions” and “[a]s previously discussed, the regulatory structure under which this rule is issued effectively limits the Agency’s ability to develop the type of requirements that can be individually tailored to accommodate particular site conditions.”<sup>61</sup>

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<sup>59</sup> 40 C.F.R. § 257.95(g)(5). Units that have triggered forced closure are provided an opportunity to continue operations for a limited period of time if there is no available disposal capacity for the CCR. *Id.* § 257.103.

<sup>60</sup> 80 Fed. Reg. at 21,371.

<sup>61</sup> *Id.*

Again, with the enactment of legislation authorizing the implementation of the CCR Rule through enforceable state CCR permits that can be tailored to take into consideration individual site conditions, EPA's reasoning no longer exists for establishing a blanket prohibition on allowing unlined surface impoundments that have triggered corrective action to employ engineering controls to address the source and continue operating in a manner that protects human health and the environment. EPA should amend the Rule to explicitly grant state permitting programs the authority to allow unlined surface impoundments undertaking corrective action to demonstrate that such units can continue to operate during corrective action in a manner that is protective of human health and the environment. This option should be added to 40 C.F.R. § 257.101(a)(1) in order to reduce unnecessary regulatory burdens.

#### **E. Adjustments to Post-Closure Care Period**

The 2010 proposal included a provision that would have allowed facilities to conduct post-closure care for less than 30 years if the owner/operator was able to demonstrate that the reduced period was sufficient to protect human health and the environment.<sup>62</sup> This option for a reduced post-closure care time period is available under both EPA's MSWLF and Subtitle C hazardous waste programs.<sup>63</sup> EPA

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<sup>62</sup> 75 Fed. Reg. at 35,253 (proposed 40 C.F.R. § 257.101(b)(1)).

<sup>63</sup> See 40 C.F.R. §§ 258.61(b)(1), 264.117(a)(2)(i).

removed this option from the Final Rule, however, “due to the lack of guaranteed state oversight for this rule.”<sup>64</sup>

But now that the states and EPA can issue individual permits based on site-specific characteristics, this concern no longer exists. Therefore, EPA should revise the Rule to include a provision allowing for a determination that a decreased period of post-closure care, as opposed to the mandatory 30-year period, is sufficient to protect human health and the environment. This provision should be added to 40 C.F.R. § 257.104(c) to reduce unnecessary regulatory burdens.

#### **F. Repeal The Rule’s Regulation of Inactive Surface Impoundments**

For the first time in its 35-year implementation of the RCRA program, EPA made the unprecedented decision in the CCR Rule to regulate “inactive units”—that is, impoundments that had ceased receiving CCR before the effective date of the CCR Rule.<sup>65</sup> EPA does *not* regulate “inactive” units under its Subtitle C hazardous waste program but rather relies on its statutory “imminent and substantial endangerment” authorities under RCRA and CERCLA to address any potential risks from inactive hazardous waste surface impoundments.

EPA’s asserted regulatory jurisdiction over inactive CCR surface impoundments is not authorized by law. As discussed in more detail below in

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<sup>64</sup> 74 Fed. Reg. at 21,426.

<sup>65</sup> The regulation of inactive surface impoundments has been challenged by the industry petitioners in the CCR Litigation.

USWAG's request for EPA to seek to hold the CCR Litigation in abeyance, RCRA is written in the present tense and its regulatory scheme is organized in a way that contemplates coverage of only those facilities that continue to operate and receive waste after the effective date of the applicable regulations. But even if some question remains on this jurisdictional issue (which USWAG believes that it does not for the reasons discussed below), the regulation of inactive CCR surface impoundments is clearly not mandated by the statute, but rather was a policy decision by the former EPA administration.

USWAG believes that EPA's policy decision to regulate inactive surface impoundments was misguided and consequently has many counterproductive and burdensome consequences without a corresponding environmental benefit. This provision is imposing hundreds of millions of dollars of inflexible, one-size-fits-all remediation costs on the power industry, overriding state risk-based cleanup programs. It is also one of the reasons why the Rule's costs far exceed its benefits. Therefore, EPA should repeal the provisions at 40 C.F.R. §§ 257.50(c) and 257.100 subjecting inactive surface impoundments to regulation under the Rule. EPA and the states can address any remaining risks from these inactive units in a more cost-effective manner under RCRA's imminent and substantial



endangerment provision (and EPA also can do so under CERCLA’s imminent and substantial endangerment provision).<sup>66</sup>

### **G. Clarification on Using the “Closure-in-Place” Option**

The CCR Rule authorizes owners or operators of CCR surface impoundments to close their impoundments by either (1) leaving the CCR in place after dewatering and/or stabilizing the wastes sufficient to support a final cover system and conducting 30 years of post-closure groundwater monitoring (referred to as “closure-in-place”) or (2) removing the CCR and decontaminating the CCR unit and releases from the unit (referred to as “closure-by-removal”).<sup>67</sup>

Impoundments that undergo closure-by-removal are exempt from undertaking post-closure care.

Importantly, the Rule does not mandate the use of the closure-by-removal option in any particular set of circumstances, but, rather, leaves to the owner or operator the choice of using either closure option. Indeed, EPA has made it clear that if the relevant performance standard is met, both closure options are equally protective. Because the costs of closure-by-removal (commonly referred to by EPA as “clean closure”) can be far greater than closure-in-place, however, the Agency correctly expects most facilities to close CCR surface impoundments under the closure-in-place option. EPA stated in the Final Rule that “most

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<sup>66</sup> 42 U.S.C. § 9606(a).

<sup>67</sup> 40 C.F.R. § 257.102.

facilities will likely *not* clean close their CCR units given the expense and difficulty of such an operation.”<sup>68</sup>

Thus, nothing in the plain text of the CCR Rule requires a particular closure option to be employed in any particular set of circumstances. In fact, EPA explicitly states that it “did not propose to require clean closure *nor to establish restrictions on the situations in which clean closure would be appropriate.*”<sup>69</sup>

Nonetheless, certain environmental interest groups contend that the closure-by-removal option *must* be selected in circumstances where CCR is in contact with the groundwater, and that the Rule’s equally protective and less costly closure-in-place option cannot be used in these circumstances. Indeed, an environmental organization recently filed a Notice of Intent (“NOI”) to bring a RCRA citizen suit against a USWAG member based solely on the facility’s closure plan, which indicates the facility intends to close an impoundment under the closure-in-place option where CCR allegedly is in contact with groundwater.<sup>70</sup>

Although the CCR regulations are explicitly clear that an owner or operator can choose which closure option is appropriate for its particular units, environmental organizations are seizing upon a recent EPA guidance document referencing, as an example, the use of “clean closure” in circumstances when CCR

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<sup>68</sup> 80 Fed. Reg. at 21,412 (emphasis added).

<sup>69</sup> *Id.* (emphasis added).

<sup>70</sup> See April 11, 2017 RCRA NOI from the Southern Environmental Law Center to EPA, the North Carolina Department of Environmental Quality, and Duke Energy.

is in contact with the groundwater as somehow suggesting that the Agency's position is that closure-by-removal is *mandated* under these circumstances.<sup>71</sup> This position is flatly at the odds with the plain language of the Rule and would impose staggering and unnecessary costs on the power industry to close CCR surface impoundments under the Rule. Indeed, the closure-in-place option specifically contemplates that CCR will remain in the unit and that any potential releases from the unit following closure—including releases from CCR in contact with groundwater—will be addressed, as necessary, through the Rule's post-closure care groundwater monitoring and corrective action requirements.

To eliminate any possible confusion regarding EPA's position on this critically important issue, and to eliminate the inappropriate reliance on EPA's example by environmental organizations seeking to increase unnecessarily and dramatically the costs of closing CCR surface impoundments, USWAG requests that EPA clarify its recent guidance addressing this matter. In particular, the Agency should make it clear that either of the Rule's closure options, including the closure-in-place option, can be employed to close a CCR surface impoundment where CCR may be in contact with groundwater.

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<sup>71</sup> See Relationship Between the Resource Conservation Act's Coal Combustion Residuals Rule and the Clean Water Act's National Pollutant Discharge System Permit Requirements, Closure Requirements, available at <https://www.epa.gov/coalash/relationship-between-resource-conservation-and-recovery-acts-coal-combustion-residuals-rule#Closure>.

Such a clarification is appropriate under all of the Administration’s Executive Orders on regulatory reform. Moreover, it is specifically called for under EO 13783, under which EPA is directed to review and modify, among other things, “guidance” that potentially burdens the development or use of domestically produced energy resources, including in particular on coal resources.<sup>72</sup>

#### **H. Confirming Beneficial Use of CCR to Close CCR Units**

The CCR Rule does not apply to the “beneficial use of CCR,” as such term is defined in the CCR Rule.<sup>73</sup> This is because EPA concluded that such practices do not pose the type of risk that warrant regulation under the Rule.<sup>74</sup> With one limited exception, the Rule does not prohibit any specific activities from qualifying as a beneficial use of CCR—including the beneficial use of CCR for purposes of closing a CCR unit.

As a result, owners/operators of CCR units clearly are authorized to use CCR for a number of purposes during the process of closing a CCR unit, including waste stabilization, structural fill, and grading or contouring the slope for the final cover system. There is nothing unique about any of these practices that would prevent them from meeting the Rule’s beneficial use conditions. Such practices are environmentally beneficial, as they conserve the use of natural resources (such

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<sup>72</sup> EO 13783 § 1(c)

<sup>73</sup> 40 C.F.R. § 257.53.

<sup>74</sup> 80 Fed. Reg. at 21,327.

as soil) that would otherwise have to be utilized for closure. And in fact, the Rule’s preamble specifically identifies structural fill and waste stabilization/solidification as potential beneficial uses.<sup>75</sup>

Nonetheless, subsequent to the promulgation of the CCR Rule, EPA has been ambiguous regarding the appropriateness of beneficially using CCR for closing CCR units. There should be no ambiguity with respect to the environmentally sound and cost-effective use of CCR in lieu of virgin materials for the closure of CCR units. Therefore, EPA should eliminate any ambiguity and confirm that the exclusion for CCR beneficial use includes beneficially using CCR to close CCR landfills and surface impoundments.<sup>76</sup>

### **I. CCR Beneficial Use at Clay Mine Sites**

As explained above, the regulatory text of the CCR Rule places no limitations on what activities can constitute beneficial use, with the only exception being the placement of CCR in a “sand and gravel pit or quarry.”<sup>77</sup> The phrase “sand and gravel pit or quarry,” in turn, is defined as “an excavation for the extraction of aggregate, minerals or metals.”<sup>78</sup> Based on this language, EPA has taken a position prohibiting the environmentally sound and beneficial practice of

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<sup>75</sup> *See id.* at 21,353.

<sup>76</sup> This clarification should also make clear that that beneficially using CCR to close units not regulated under the rule (i.e., inactive landfills) does not cause those units to become subject to regulation.

<sup>77</sup> *See* 40 C.F.R. § 257.53 (definition of “Beneficial use of CCR”).

<sup>78</sup> *Id.* (definition of “Sand and gravel pit or quarry”).

using CCR to reclaim clay mines on the grounds that the placement of CCR in a clay mine cannot be a beneficial use, irrespective of purpose or function, because a clay mine is or was a site used for the extraction of minerals—*i.e.*, clay.<sup>79</sup>

This interpretation is needlessly prohibiting a cost-effective and environmentally sound CCR beneficial use practice and is imposing unnecessary disposal costs on CCR when the CCR can otherwise be beneficially used to reclaim clay mines in lieu of using virgin materials. EPA itself recognizes that clay is an adequate “liner” for preventing the migration of CCR contaminants.<sup>80</sup> EPA should therefore clarify in the CCR regulations that the definition of “sand and gravel pit or quarry” does not include clay mines and thereby provide owners/operators of such sites with the opportunity, as is the case with other CCR beneficial use structural fill activities, to demonstrate that the use of CCR to reclaim such sites meets the CCR Rule’s beneficial use criteria.

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<sup>79</sup> EPA listed the Brickhaven No. 2 Mine Tract A, a former clay mine being reclaimed with CCR, on its initial draft open dump inventory. The site was subsequently removed from the final open dump inventory because the owner/operator posted a CCR Rule-compliant public website and fugitive dust control plan. *See* EPA Finalized Initial Open Dump Inventory as of January 12, 2017, available at <https://www.epa.gov/coalash/compliance-data-and-information-websites-required-disposal-coal-combustion-residuals-ccr>.

<sup>80</sup> Existing CCR surface impoundments are considered “lined” if constructed with a minimum of two feet compacted soil with a hydraulic conductivity of no more than  $1 \times 10^{-7}$  cm/sec. *See* 40 C.F.R. § 257.71(a)(1)(i).

## **J. State-Approved Liner Systems**

In promulgating the CCR Rule, EPA established prescriptive liner design criteria that unfortunately failed to include liner systems for CCR units that state regulatory bodies have found to protect adequately human health and the environment.<sup>81</sup> This means, for example, some CCR units that are considered to be “lined” under applicable state CCR requirements are nonetheless classified as “unlined” under the CCR rule. This subjects those CCR units to extremely burdensome requirements not imposed on lined units, including, in some circumstances, mandatory closure requirements.<sup>82</sup>

Given that the WIIN Act now allows the CCR Rule to be implemented through enforceable state permit programs, this disregard for acceptable state liner requirements is at odds with the Administration’s principles of federalism and imposes unnecessarily burdensome requirements on CCR units. Therefore, EPA should modify the Rule at 40 C.F.R. § 257.71 to allow for a determination that a CCR unit with an existing state-approved or -accepted liner system qualifies as a lined CCR unit under the Rule.

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<sup>81</sup> 80 Fed. Reg. at 21,370 (noting that the state of Florida’s criteria for a liner system does not qualify as a “liner” under the federal CCR Rule).

<sup>82</sup> *See id.* at 21,371.

## **K. Correction to Definition of Beneficial Use**

In promulgating the definition of “beneficial use” at 40 C.F.R. § 257.53, a clear mathematical error was made in calculating the volume of CCR that triggers the need to make an environmental safety demonstration when using CCR in an unencapsulated manner.<sup>83</sup> Although the rulemaking record shows that the volume threshold triggering this requirement should have been 75,000 tons, EPA mistakenly calculated the number to be 12,400 tons.<sup>84</sup> The Agency’s failure to correct this figure, despite its awareness of the error, unnecessarily burdens power companies attempting to beneficially use CCR. EPA should therefore amend the definition of “beneficial use of CCR” at 40 C.F.R. § 257.53 such that the fourth condition applies only to unencapsulated uses exceeding 75,000 tons of CCR.<sup>85</sup>

### **REQUEST TO HOLD CCR LITIGATION IN ABEYANCE**

As explained above, given that certain of the provisions of the Rule identified in this Petition for reconsideration are the subject of ongoing litigation,<sup>86</sup>

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<sup>83</sup> When unencapsulated use of CCR involves placement on the land of 12,400 tons or more in non-roadway applications, the user must demonstrate that environmental releases to groundwater, surface water, soil and air are comparable to or lower than those from analogous products made without CCR, or that environmental releases to groundwater, surface water, soil and air will be at or below relevant regulatory and health-based benchmarks for human and ecological receptors during use. 40 C.F.R. § 257.53 (definition of “Beneficial use of CCR”).

<sup>84</sup> See April 1, 2015 Letter from Headwaters Resources, Inc. to EPA, Docket No. EPA-HQ-RCRA-2009-0640-12147 (identifying an error in the calculation of the “smallest size landfill,” which was EPA’s basis for the 12,400 ton volume limitation).

<sup>85</sup> The 12,400 ton limitation has been challenged by industry petitioners in the CCR Litigation.

<sup>86</sup> *Utility Solid Waste Activities Group, et al. v. EPA, et al.*, No. 15-1219.



it is appropriate for EPA to seek to hold the case in abeyance while the Agency reconsiders and/or modifies its positions in the litigation. If the Agency ultimately modifies its positions with regard to the challenges raised by industry petitioners, industry petitioners would support a voluntary remand of those issues to the Agency.

In particular, five industry petitioners, including USWAG, and eight environmental group petitioners have challenged certain portions of the Final Rule in the United States Court of Appeals for the District of Columbia Circuit. Industry petitioners have argued that elements of the Rule exceed EPA's statutory authority, were promulgated without notice and comment, and/or are arbitrary and capricious, while environmental petitioners argue that elements of the Rule are too lenient and are arbitrary and capricious. All the petitions have been consolidated and briefing is complete, but the Court has not yet set a date for oral argument.<sup>87</sup>

For all the reasons identified in this Petition, it is appropriate for EPA to seek to hold the case in abeyance.<sup>88</sup> This would allow EPA to reconsider its

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<sup>87</sup> EPA entered into a settlement agreement with USWAG and environmental petitioners agreeing to a remand on certain aspects of their respective challenges to the Rule. The settlement requires EPA to engage in a new round of rulemaking that will require EPA to undergo notice-and-comment rulemaking to potentially revise the CCR Rule on certain key issues, including (1) clarifying the degree to which non-groundwater releases are subject to the Rule's corrective action provisions; (2) develop vegetative cover requirements for CCR units; (3) evaluate and undertake a rulemaking as appropriate to include the consideration of non-CCR wastewaters in the Rule's alternative closure provision; and (4) whether to add boron to the Rule's list of Appendix IV constituents.

<sup>88</sup> The other industry petitioners in the CCR litigation have represented to USWAG that they agree with this position.

position on these issues in light of the WIIN Act and the President’s Regulatory Reform Executive Orders and modify such positions to the extent permitted by law and supported by a reasoned explanation.<sup>89</sup>

The Agency has recently taken similar action to hold in abeyance pending litigation involving the prior EPA Administration’s position on regulations impacting the power and other industry sectors.<sup>90</sup> For example, the Agency recently filed a motion to hold in abeyance litigation challenging an EPA rule involving the regulation of hazardous air pollutants from coal- and oil-fired electric utility power plants<sup>91</sup> to allow the new Administration time to reassess its position on the Rule in light of EO 13783.<sup>92</sup> In filing this motion, EPA specifically referenced its obligation under EO 13783 to review for possible

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<sup>89</sup> See *FCC v. Fox Television Stations, Inc.*, 556 U.S. 502, 515 (2009); *Motor Vehicle Mfrs. Ass’n of the U.S., Inc., et al. v. State Farm Mut. Auto. Ins. Co., et al.*, 463 U.S. 29, 42 (1983).

<sup>90</sup> See e.g., “Respondent EPA’s Motion to Continue Oral Argument,” in *Walter Coke, Inc., et al., v. EPA*, No. 15-1166 (D.C. Cir.); see also Notice of Executive Order and Motion to Hold Case in Abeyance, *American Petroleum Institute, et al. v. EPA*, No. 13-1108 (and consolidated cases) (D.C. Cir.) (citing *Nat’l Cable & Telecomm. Ass’n v. Brand X Internet Servs.*, 545 U.S. 967, 981 (2005) (“EPA’s interpretations of statutes it administers are not ‘carved in stone’ but must be evaluated ‘on a continuing basis,’ for example, ‘in response to . . . a change in administrations.”). See also *Nat’l Ass’n of Home Builders v. EPA*, 682 F.3d 1032, 1038, 1043 (D.C. Cir. 2012) (a revised rulemaking based “on a reevaluation of which policy would be better in light of the facts” is “well within an agency’s discretion,” and “[a] change in administration brought about by the people casting their votes is a perfectly reasonable basis for an executive agency’s reappraisal of the costs and benefits of its programs and regulations.”).

<sup>91</sup> Supplemental Finding That It Is Appropriate and Necessary to Regulate Hazardous Air Pollutants From Coal- and Oil-Fired Electric Utility Steam Generating Units, 81 Fed. Reg. 24,420 (Apr. 25, 2017).

<sup>92</sup> See Respondent EPA’s Motion to Continue Oral Argument in *Murray Energy Corp., et al. v. EPA, et al.*, No. 16-1127 (and consolidated cases) (D.C. Cir.) (filed April 18, 2017).

reconsideration *any* rule that could “potentially burden the development and use of domestically produced energy resources, with particular attention to oil, natural gas, coal, and nuclear resources.”<sup>93</sup> The CCR Rule unquestionably falls within the category of a rule that could potentially burden the development and use of domestically produced coal, oil and natural gas resources and therefore warrants similar reconsideration by the Agency.

All of the issues raised by industry petitioners in their challenge to the CCR Rule warrant reevaluation and modification by the new Administration. One issue in particular, however, warrants reevaluation and repeal pursuant to the President’s Regulatory Reform policies: the Rule’s regulation of “inactive” CCR surface impoundments—*i.e.*, impoundments where facility owners/operators ceased placing CCR *before* the effective date of the Rule.<sup>94</sup> In some cases, a regulated “inactive” impoundment ceased receiving CCR *years* before the effective date of the Rule.

As explained above, the regulation of inactive disposal units under RCRA is unprecedented. EPA readily acknowledges that it does *not* regulate “inactive” units under its Subtitle C hazardous waste program or under its MSWLF program (40 C.F.R. Part 258).<sup>95</sup> Indeed, EPA expressly “acknowledged that [regulating

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<sup>93</sup> *Id.*

<sup>94</sup> *See* 40 C.F.R. §§ 257.50(c), 257.100.

<sup>95</sup> 80 Fed. Reg. at 21,342.

inactive surface impoundments] represented a departure from the Agency's long-standing implementation of the [hazardous waste] regulatory program under subtitle C," and that "EPA has generally interpreted [RCRA] to require a permit only if a facility treats, stores, or actively disposes of the wastes after the effective date of its designation as a hazardous waste."<sup>96</sup>

Despite this long standing practice of not regulating inactive units under RCRA, the prior EPA Administration nonetheless asserted that it was appropriate, for the first time, to exercise jurisdiction over inactive CCR surface impoundments under the CCR Rule because of EPA's allegation that the risks from inactive CCR surface impoundments are equivalent to the risks of active CCR surface impoundments.<sup>97</sup> Thus, EPA's asserted jurisdiction over inactive CCR surface impoundments in the CCR Rule is *not* mandated by the statute, but rather was solely a policy decision by the former EPA Administration.<sup>98</sup>

But this policy decision is not authorized under RCRA. As detailed in USWAG's briefs, EPA is statutorily constrained under RCRA Subtitle D to regulate "sanitary landfills," which are defined as units for the "disposal" of solid waste. Under RCRA's statutory text, legislative history, and case law, the term "disposal" encompasses units that are presently receiving solid waste. Therefore,

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<sup>96</sup> *Id.*

<sup>97</sup> *Id.*

<sup>98</sup> *Id.*

the CCR Rule can only regulate those units that were receiving CCR as of the effective date of the Rule.

Instead, Congress gave EPA, states, and citizens specific authority to address any concerns with "past disposal" activities at inactive units under RCRA's imminent and substantial endangerment provisions.<sup>99</sup> These provisions have been utilized since RCRA's inception over 35 years ago to address potential concerns with inactive solid and hazardous waste units. EPA has never suggested that these pre-existing statutory provisions have been ineffective or somehow insufficient to address the risks from such units, including inactive CCR surface impoundments.

Instead of EPA utilizing its existing statutory authorities to address on a site-specific basis the potential risk posed by inactive CCR impoundments, the Rule subjects all of these units to a one-size-fits-all set of mandated remediation criteria with no ability to tailor any potential response to the unique features and potential risks of the unit. This is completely antithetical to EPA's historic practice of using its RCRA imminent hazard authorities to address these sites on a unit-specific basis, which provides for a more cost-effective and tailored response mechanism.

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<sup>99</sup> See 42 U.S.C. § 6973(a) (authorizing EPA to address the "past or present disposal" of any solid waste, including CCR, that may present an imminent and substantial endangerment to health or the environment); see also *Id.* § 6972(a)(1)(b) (authorizing any person, including the states, to bring an action for "past or present" disposal of solid waste which may present an imminent and substantial endangerment to health or the environment).

This means the power industry is needlessly incurring hundreds of millions of dollars in costs in complying with inflexible, one-size-fits-all standards for units that may not pose a risk to human health and the environment. Where a specific inactive impoundment poses an unreasonable risk, this risk would be better addressed using the more cost-effective and targeted imminent and substantial endangerment provisions.

The regulation of inactive impoundments is therefore one of the key provisions in the Rule where the costs far exceed the benefits. Because this particular CCR provision is undeniably an undue burden on the development and use of domestic energy resources—at both coal-fired facilities *and* oil- and gas-fired facilities with inactive CCR surface impoundments—it is appropriate for reconsideration and rescission under the President’s Regulatory Reform orders, including EO 13777, 13771, and 13783.

Other issues challenged in the litigation as arbitrary and capricious also warrant reconsideration and modification by the new Administration, including, among others:

- i. CCR Storage: On-site storage of CCR destined for beneficial use is considered a regulated CCR landfill, even though the exact same storage activities are excluded from regulation if conducted off-site;
- ii. Beneficial Use Volume Threshold: the Rule imposes additional requirements on the beneficial use of CCR in amounts of more than 12,400 tons, even though EPA acknowledged that this volume limitation was based on a mathematical error;

- iii. Seismic Location Restriction: the Rule imposes an unreasonable short deadline for meeting the seismic location restriction. EPA also failed to provide an adequate basis for applying the seismic location restriction to expansions of existing CCR landfills;
- iv. Alternative Closure: the Rule imposes an absolute prohibition on considering cost or convenience in determining whether a unit can qualify for an extended closure schedule; and
- v. Risk-Based Compliance Alternatives: as explained above, the Rule fails to include any risk-based compliance alternatives.<sup>100</sup>

For all the above reasons, EPA should seek to hold the litigation in abeyance while EPA reconsiders its position on the issues raised by industry petitioners in their challenge to the CCR Rule.

## CONCLUSION

The CCR Rule affects both the utility and coal industries and also affects the large and small businesses that support and rely upon those industries. It is causing significant adverse impacts on coal-fired generation in this country due to the excessive costs of compliance—even EPA acknowledges the costs of the Rule outweigh its benefits. Those impacts are being, and will be, felt in communities around the country where those industries operate. Reconsideration will enable the Agency to take all of these impacts into account to the full extent

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<sup>100</sup> Industry petitioners also are challenging elements of the Rule on grounds that EPA failed to provide adequate notice and comment, including (i) EPA's imposition of requirements on the beneficial use of CCR; (ii) the requirement for owners/operators of surface impoundments to certify compliance with specified dam safety factors not set forth in the proposed rule; and (iii) the requirement that the base of existing CCR surface impoundments be at least five feet above the uppermost aquifer underlying the impoundment.

allowed by law, as contemplated by recent Executive Orders and the changed statutory structure under which the Rule is to be implemented.

For all the foregoing reasons, EPA should grant this Petition, take action to extend the Rule's upcoming compliance deadlines, promptly undertake to initiate a new rulemaking to reflect the required changes identified in this Petition, and seek to hold the CCR Litigation in abeyance to allow the new EPA Administration to reassess its position in the litigation in light of this Petition, the WIIN Act, and the President's Executive Orders on regulatory reform.

Dated: May 12, 2017

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# **Appendix A**

# Use of Background Concentration as Groundwater Protection Standard for Appendix IV Constituents without Federal Maximum Contaminant Levels (MCLs)

Prepared for  
Utility Solid Waste Activities Group  
Ash Management Committee

May 2, 2017



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# 1 Introduction

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In 2015, the Federal Coal Combustion Residual Rule (CCR) promulgated a new groundwater monitoring program for CCR disposal facilities. The program consists of a tiered system of monitoring requirements. Under the program, utilities are required to monitor a specific set of chemical constituents (commonly referred to as Appendix III constituents). If any Appendix III constituents are detected at statistically significant levels (SSLs) above background concentrations, then assessment monitoring is triggered. Under the assessment monitoring program, a different series of constituents (referred to as Appendix IV constituents) is monitored; the detection of any Appendix IV constituent at a statistically significant increased (SSI) concentration relative to its groundwater protection standard (GWPS) triggers groundwater corrective action and remediation to achieve the GWPS.

The CCR Rule stipulates that the relevant GWPS for each Appendix IV constituent is the federally established Maximum Contaminant Level (MCL); for constituents that do not have established MCLs, the site-specific background groundwater concentration is the relevant GWPS. The Appendix IV constituents without MCLs include cobalt, molybdenum, lithium and lead.

Using the background concentration as a GWPS for constituents without an MCL is problematic; such an approach causes constituents without MCLs to trigger corrective action disproportionately and requires more stringent clean-up requirements. In addition, such an approach runs antithetical to other US EPA's relevant regulatory programs in which protecting public health is based on the use of risk-based benchmarks.

This memo provides a regulatory and technical basis for why using background as a GWPS for constituents without an MCL is inconsistent with current US EPA regulatory policy, and causes excessive resource expenditure without providing any added public health benefit. Key conclusions include:

- The establishment of GWPS at background for Appendix IV constituents without MCLs is inconsistent with US EPA policy of establishing and using health-based remediation standards for RCRA cleanups.
- Requiring remediation for Appendix IV constituents without MCLs to background, when groundwater levels for these constituents are *below* established EPA health-based standards, results in excessively costly- and resource-intensive corrective action, without providing any public health benefit.
- Technologies employed to remediate arsenic, which is the key risk driver in the CCR rule, will generally also remediate the Appendix IV constituents without MCLs to their respective health-based levels. However, additional and more extensive treatment will be required for these Appendix IV constituents if their GWPS is background.
- Using background as the GWPS for Appendix IV constituents without MCLs, will result in scenarios where corrective action is triggered solely because the Appendix IV constituent is above background, but still below applicable health-based levels. This will result in a large expenditure of resources and costs without resulting in any added protection to human health.

## 2 Risk-based safety determinations and corrective action assessments are a cornerstone of US EPA regulatory programs

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Using risk assessment to establish safe levels of exposures to chemicals in water, food, soil, and air is a central tenant of US federal and state regulatory agencies, including US EPA. In fact, US EPA provides leadership in risk assessment principles and implementation and has produced a multitude of guidance documents that put forth best risk assessment practices in general and under more specific environmental assessment conditions (*e.g.*, US EPA, 1989, 2007a, 2012a, 2016a). Many different programs at US EPA use these principles to establish concentrations of chemicals in environmental media that are protective of public health, including the Office of Water for establishing MCLs, the Office of Pesticides for determining safe levels of pesticides on plants and in soil, and the Office of Air for setting National Ambient Air Quality Standards, among many others. Moreover, as explained below, risk-based remedial actions are integral both to the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), (*i.e.*, Superfund program) and the Resource Conservation and Recovery Act (RCRA) (Herman and Laws, 1996).

CCR disposal is currently regulated under the Resource Conservation and Recovery Act (RCRA). In its communication outreach, US EPA described the importance of risk assessment for RCRA and its key functions:

Risk information is an essential factor in determining which industrial wastes are judged to be hazardous wastes and should therefore be managed under the RCRA hazardous waste system. Risk assessment is also used in developing waste management programs for nonhazardous wastes. Risk information is used in targeting waste minimization efforts, issuing operating permits, determining the need for cleanup actions at permitted facilities, and setting cleanup goals. Risk assessment is also used in cost-benefit analysis for major rules and regulations and to chart strategic directions for the RCRA program (US EPA, 2001).

Of particular relevance to the CCR Rule are the risk-based policies and resources for the protection and remediation of impacted groundwater that US EPA has developed. Specifically, US EPA has established Regional Screening Levels (RSLs) to assess potential human health risks from chemicals in soil, water, and air. The RSLs are derived using conservative exposure assumptions and toxicity factors (which are also usually developed by US EPA) that represent a Reasonable Maximum Exposure (RME) scenario for long-term or chronic exposures (US EPA, 2016c). US EPA routinely updates these values to reflect the best available science. For the protection of groundwater, the RSLs consider all routes of exposure, including drinking water ingestion, dermal exposure during bathing, and inhalation exposures if the constituent is volatile. These values assist risk assessors with determining whether levels of constituents at a site may warrant further investigation or cleanup, or whether no further investigation is required (US EPA, 2016c).

If further investigation is warranted, more sophisticated risk evaluation approaches may be needed. Under the Superfund Program, US EPA has issued robust guidance over several decades for developing risk-based clean-up goals for groundwater that protect public health. Using this guidance in conjunction with US EPA policy, **it is important to appreciate that the majority of (if not all) site clean-ups/corrective actions**

**involve cleaning up to a risk-based value, not background.** In fact, background is usually set as a goal only if achieving the risk-based value is implausible because it falls below background (US EPA, 2002).

The specific explanation given in the CCR Rule for deviating from US EPA's risk-based approach and using background concentrations as cleanup goals instead of health-based groundwater benchmarks for Appendix IV constituents without MCLs is that "it was unlikely that a facility would have the scientific expertise necessary to conduct a risk assessment, and was too susceptible to potential abuse" (US EPA, 2015a). However, such a statement is not supportable, given how integral risk assessment is to RCRA regulatory programs and that US EPA RSLs are available for all of the Appendix IV constituents (see Table 3.1 for a summary of the RSLs and Section 3.4 for more discussion on lead health-based benchmarks). Even under a self-implementing program, these RSLs are readily available and can be used to conservatively determine if there is a potential risk that may warrant action.

### 3 Corrective actions to achieve background would require significantly more treatment with added cost without providing any health benefit

Aside from inconsistency with standard US EPA practice and policy, using background as clean-up goal will be excessively costly and resource-intensive, without providing any public health benefit. Using this approach, sites in corrective action may be required to remediate groundwater to levels that are many times lower than established health-based benchmarks (up to 100 times lower<sup>1</sup>). Table 3.1 presents a comparison of the US EPA-developed RSLs for these constituents to the respective typical (median)<sup>2</sup> background concentrations in groundwater obtained from the US Geological Survey. As presented in Table 3.1, background concentrations of these constituents in groundwater are 7-100 times below the health-based benchmarks (*i.e.*, RSLs) developed by US EPA.

**Table 3.1 Comparison of US EPA Health-based Criteria and Generic Background Levels**

Constituent <sup>a</sup>	US EPA Tap Water RSL <sup>b</sup> (µg/L)	USGS Median GW Concentrations <sup>c</sup> (µg/L)	Fold Difference
Cobalt	6	0.17	35
Lithium	40	6	7
Molybdenum	100	1	100

Notes:

a) Lead was not included in this table. The US EPA Tap Water RSL for lead is not a health-based value, because US EPA has not established toxicity criteria (an RfD or CSF) with which to calculate screening criteria for lead, as they have for other constituents. While having some health basis, this value is based on the best treatment technology available to remove lead from drinking water, considering cost. Refer to Section 3.4 for more information on an appropriate health-based benchmark for lead.

b) US EPA, 2016d.

c) USGS, 2011.

CSF = Cancer Slope Factor; GW = Groundwater; HA = Health Advisory; HRL = Health Reference Level; RfD = Reference Dose; RSL = Regional Screening Level; US EPA = US Environmental Protection Agency; USGS = US Geological Survey.

The sections below provide a brief summary of each of the constituents highlighting the additional remediation that would be required to achieve background instead of the RSL. This information is summarized in Table 3.2. For this analysis, data from the Electric Power Research Institute (EPRI) Characterization of Field Leachates at Coal Combustion Product Management Sites (2006) was used to approximate field ash leachate concentrations (2006; Table 4-1). This data is based on a dataset consisting of 67 samples from surface impoundments and landfills and includes data collected from multiple sources including wells screened within CCR, drive point piezometers, seep samplers, core extracts, samples from leachate collection systems, and pond water samples collected from near the CCR-water interface, sluice lines, and impoundment outfalls. Because a significant portion of this dataset comes from impoundment

<sup>1</sup>Not including lead, because the drinking water standard for lead is not health-based.

<sup>2</sup>Note that data from the USGS report were used to provide perspective on typical background concentrations cobalt, lithium, and molybdenum. Under the rule, site-specific background concentrations would need to be established to determine if corrective action was warranted.

water samples which likely contain lower CCR constituent concentrations than interstitial water samples from within the CCR, this dataset is likely biased low, and thus, conservative. Nonetheless, data presented in this report are consistent with data used by US EPA in the 2014 Final Human and Ecological Risk Assessment for Coal Combustion Residuals (US EPA, 2014). The median CCR constituent concentrations used in the analyses below are meant to approximate typical leachate concentrations that exist across CCR management units, but it should be noted that the data were generated from a sub-set of facilities and median estimates may change (up or down) given additional data.

### 3.1 Cobalt

Cobalt is an essential element, forming part of the B12 vitamin, and necessary for maintaining normal biological function. The recommended amount of daily B12 is about 6 µg (ATSDR, 2004). This dietary pathway is reported to be the largest source of cobalt exposure in the general population (ATSDR, 2004). Estimated intake rates range from 5-40 µg/day (0.07-0.57 µg/kg-day for a normal adult), and an average person consumes about 11 µg/day of cobalt from food (ATSDR, 2004). US EPA has developed a health-based RSL for cobalt of 6 µg/L. The cobalt RSL assumes that a 15-kg child will drink 0.78 L of water containing cobalt per day and bathe in water containing cobalt for 32 minutes each day (US EPA, 2016c).

As noted in Table 3.1, the median background concentration of cobalt in groundwater is 35 times lower than the RSL developed by US EPA. The median concentration of cobalt in CCR ash leachate (1 µg/L) is 6 times lower than the health-based cobalt RSL developed by US EPA. Thus, at the majority of CCR ash sites, no remediation would be required to achieve health-based benchmarks and protect human health. In contrast, in order to remediate median cobalt levels to background (*i.e.*, reduce levels from 1 µg/L to 0.17 µg/L), groundwater concentrations would need to be reduced by about 80% (about 6-fold).

### 3.2 Lithium

Lithium is a strategic metal that is naturally present at low concentrations in soil and water. Estimated dietary intake rates range from 0.24-1.5 µg/kg-day.<sup>3</sup> The US EPA has developed a health-based RSL for lithium of 40 µg/L (US EPA, 2012b). The lithium RSL assumes that a 15-kg child will drink 0.78 L of water containing lithium per day and bathe in water containing lithium for 32 minutes each day (US EPA, 2016c).

As noted in Table 3.1, the median background concentration of lithium in groundwater is over 6 times lower than the health based value developed by US EPA. The median concentration of lithium in CCR ash leachate (129 µg/L) exceeds the health-based lithium RSL (40 µg/L) developed by US EPA. Thus, a 70% (3-fold) reduction in lithium concentrations would be required at CCR ash sites to achieve health-based benchmarks and protect human health. In contrast, in order to remediate median lithium levels to background groundwater concentrations (*i.e.*, reduce levels from 129 µg/L to 6 µg/L), the lithium concentrations would need to be reduced by about 95% (nearly 22-fold).

### 3.3 Molybdenum

Molybdenum is an essential element and is necessary for normal biological function. As an essential metal, the body is able to regulate molybdenum and limit its toxicity under higher than normal exposure conditions. In recognition of the essentiality of molybdenum, the Institute of Medicine (IOM) of the

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<sup>3</sup>Although one source reports a significantly higher daily intake for lithium of 33-80 µg/kg-day for ingestion from food and municipal water (Moore, 1995, as cited in US EPA, 2008).



National Academies has developed an estimated average requirement (EAR) and recommended dietary allowance (RDA) for molybdenum. Based on studies that examined molybdenum excretion over a large dose range, IOM established an EAR of 34 µg/day for adults (IOM, 2001). Based on this analysis, IOM also established an RDA of 45 µg/day for adults (IOM, 2001). Although molybdenum is essential for certain biological functions, it is associated with specific toxic effects at high doses, which is true for all chemicals, including other essential elements. US EPA has developed an RSL of 100 µg/L (US EPA 2016d). The molybdenum RSL relies on the same assumptions articulated above for cobalt and lithium.

As noted in Table 3.1, the median background concentration of molybdenum in groundwater is 100 times lower than the health based value developed by US EPA. The median concentration of molybdenum in CCR ash leachate (405 µg/L) exceeds the health-based molybdenum RSL (100 µg/L) developed by US EPA. Thus, a 75% (4-fold) reduction in molybdenum concentrations would be required at CCR sites to achieve health-based benchmarks and protect human health. In contrast, in order to remediate median molybdenum levels to background groundwater concentrations (*i.e.*, reduce levels from 405 µg/L to 1 µg/L), the molybdenum concentrations would need to be reduced by about 99.8% (405-fold).

### 3.4 Lead

The regulation of lead in groundwater is unique. While there is some health basis for drinking water standard for lead, this value is also driven by a treatment technique requiring that water systems minimize exposure to lead in drinking water resulting from water corrosivity (US EPA, 2007b). The drinking water standard for lead is exceeded if the lead concentration in more than 10% of the tap water samples collected during the sampling period is greater than 15 µg/L. Thus, the drinking water standard for lead may not be suitable for selection as a cleanup value at CCR ash sites.

Instead, US EPA risk assessment methodology routinely relies on modeling to determine risk levels and appropriate cleanup values for lead. Specifically, the US EPA uses the Adult Lead Model (ALM) or child Integrated Exposure Uptake Biokinetic (IEUBK) Model (US EPA, 1994, 2003, 2010) as appropriate to develop acceptable lead levels in groundwater on a site-specific basis. These models calculate a level based on the probability of a child or a developing fetus having a blood lead level greater than 10 µg/dL.

While there is no readily available benchmark for lead remediation goals for CCR ash sites, and developing a site-specific value can be complex, it is noteworthy that the median concentration of lead in CCR ash leachate is generally low or not detectable (median = <0.20 µg/L) and thus corrective actions involving lead would be rare.

**Table 3.2 Reduction to Achieve Health-based Values vs Background**

Constituent	Median CCR Leachate Concentrations <sup>a</sup> (µg/L)	GWPS Option		Fold Reduction Needed		% Reduction Needed	
		US EPA Tap Water RSL <sup>b</sup> (µg/L)	USGS Background Groundwater Concentration <sup>c</sup> (µg/L)	Health-based	Background	Health-based	Background
Cobalt	1	6	0.17	NR	6	NR	83%
Molybdenum	405	100	1	4	405	75%	99.8%
Lithium	129	40	6	3	22	69%	95%
Lead	<0.20	15	0.07	NR	NR	NR	NR

Notes: CCR = Coal Combustion Residual Rule; GWPS = Groundwater Protection Standard; NR = No Reduction Needed; RSL = Regional Screening Level; USGS = United States Geological Survey.

Sources: a) EPRI, 2006; b) US EPA, 2016d; c) USGS, 2011.

## **4 Remediation of arsenic, which is likely key risk driver at most sites, will likely remediate lithium, molybdenum, and cobalt below risk-based levels**

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In general, the corrective action process and treatment technology design is a site-specific process that should be conducted based on site conditions. However, conventional technologies that remove arsenic, a key risk driver at many sites, may be able to partly remove other Appendix IV constituents including those without an established MCL, particularly if the level of treatment efficiency needed is in a similar range. For example, the Treatment Technology Summary for Critical Pollutants of Concern in Power Plant Wastewaters report by EPRI (2007) described a case study where a bioremediation technology was used for arsenic and selenium removal. The results showed that the treatment system also removed more than 90% of cobalt and molybdenum. Thus, if treating for arsenic, this level of treatment efficiency may be enough to meet the RSLs for the Appendix IV constituents without any additional cost. In contrast, if there is a large margin between the level of remediation required for arsenic compared to the other Appendix IV constituents without MCLs, it is likely that, based on the current CCR rule requirements, constituent-specific treatment systems in addition to conventional technologies used for arsenic treatment would be needed.

Table 4.1 demonstrates that if RSLs are used as the GWPS for constituents without MCLs, the level of remediation required to remove arsenic will be similar or greater than the level needed for molybdenum, lithium, and cobalt (2.5 fold decrease needed for arsenic vs 0-4.1 fold decrease needed for other constituents). Consequently, remediation technologies that target arsenic and partly remove other constituents will likely also be effective in reducing these constituents below the RSLs. In contrast, if background is used as the GWPS for constituents without MCLs, the level of remediation required between arsenic and other constituents is much more substantial (2.5-fold decrease needed for arsenic vs 5.9 to 405-fold decrease needed for other constituents), such that remediating for arsenic will be ineffective in reducing the other constituents to background and additional treatments will be required.

**Table 4.1 Groundwater Corrective Action Treatment Efficiency Required to Achieve GWPS**

Constituent	Fold Reduction Required (Ratio of Median Leachate Concentration to GWPS using RSLs for constituents without MCLs )
Arsenic	2.5 <sup>a</sup>
Antimony	--- <sup>b</sup>
Barium	--- <sup>b</sup>
Beryllium	--- <sup>b</sup>
Cadmium	--- <sup>b</sup>
Chromium	--- <sup>b</sup>
Mercury	--- <sup>b</sup>
Selenium	--- <sup>b</sup>
Thallium	--- <sup>b</sup>
Cobalt	--- <sup>b</sup>
Lithium	3.2
Molybdenum	4.1

Notes: GWPS = Groundwater Protection Standard; MCL = Maximum Containment Level; RSL = Regional Screening Level.

a) GWPS is based on the MCL.

b) For these constituents, the leachate concentration is already below GWPS

c) GWPS is based on typical groundwater background concentration (USGS, 2011).

## 5 Using health based-benchmarks for a subset of constituents and background for another subset will cause constituents without MCLs to disproportionately trigger correction action

The preceding sections provided information on the implications regarding the remediation of Appendix IV constituents if background is used as the GWPS. Another aspect of using background as the GWPS relates to an earlier step in the groundwater monitoring requirement—the triggering of assessment monitoring and subsequent corrective action. Although which and how many constituents trigger assessment monitoring will be site-specific, Table 5.1 provides perspective on how the GWPS (*i.e.*, background *vs* a health-based value) affects the proportion of samples that can trigger assessment monitoring and corrective action for specific key constituents. The present analysis is restricted to arsenic, which is likely to trigger a substantial number of assessment monitoring and corrective actions as well as the Appendix IV constituents without MCLs. It should be noted that the percentages listed in Table 5.1 are calculated using the same EPRI (2006) data described in Section 2 and are based on detectable samples only. The percentage of samples with constituents not detected in groundwater is also reported in the table.

As presented in Table 5.1, using background as the GWPS for Appendix IV constituents instead of a health-based value (*e.g.*, MCL) will increase the number of times assessment monitoring and subsequent corrective action is initiated. These values demonstrate how a scenario could occur where assessment monitoring and corrective action is completely driven by constituents that lack MCLs that are present above background but below health-based values. This translates into resource intensive groundwater remedies that provide no added protection to public health. As an example using EPRI (2006) leachate data to approximate utility-wide groundwater monitoring concentrations, one could expect molybdenum samples to trigger assessment monitoring and subsequent corrective action approximately 76% of the time if a health-based benchmark is used as the GWPS. In contrast, one could expect corrective action to be triggered over 95% of the time if background is used as the GWPS.

Although this analysis is based on a small data set and caution should be used to directly infer actions across facilities, these results suggest that increases in the number of samples that can trigger assessment monitoring and corrective action if background were used as the GWPS could be significant and result in an initiated corrective action at a substantial number of facilities. This is would involve a large expenditure of resources and cost that would not result in any added protection to human health.

**Table 5.1 Approximation of the Percentage of Samples that will Trigger Corrective Action under Different Potential GWPSs**

	Percentage of Detections	Using Health-based Standard as GWPS for all Constituents	Using Background as GWPS for All Constituents without MCLs
Arsenic	100	70 <sup>a</sup>	70 <sup>a</sup>
Cobalt	68	38	94
Lithium	87	85	95
Molybdenum	>95	76	>95

Notes: GWPS = Groundwater Protection Standard; MCL = Maximum Containment Level.

a) GWPS for arsenic is the MCL under both scenarios.

## **6 The Water Infrastructure Improvements for the Nation Act (WIIN) Act creates a permitting program that can support the use of health-based benchmarks**

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When the 2015 CCR Rule was passed, enforcement authority was not assigned to the federal or state government (US Congress, 2016). This lack of direct oversight is one of the key reasons that US EPA opted to use background as the GWPS for constituents when an MCL was not available. As mentioned in Section 2, the 2015 CCR Rule stated that independent development of a health-based benchmark for constituents without MCLs "was determined to be inappropriate in a self-implementing rule, as it was unlikely that a facility would have the scientific expertise necessary to conduct a risk assessment, and was too susceptible to potential abuse" (US EPA, 2015b).

Since the passage of the 2015 CCR Rule, however, new legislation promulgated under the WIIN Act has amended the Federal CCR rule to allow for US EPA-approved state permitting programs. Such a process would allow for the development and regulatory approval of more site-specific health based benchmarks. The creating of state permits to oversee CCR Rule enforcement, which will include compliance with groundwater monitoring requirements, will be similar to other state-run permit programs that ensure facilities develop and meet appropriate risk based standards.

## 7 Conclusions

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Using background concentrations as GWPSs for Appendix IV constituents without MCLs has far-reaching cost and resource allocation implications for CCR disposal facilities. The use of background concentrations as a GWPS for some constituents and MCLs for others results in disparate treatment of constituents and triggers costly corrective action remedies that will not provide any public health benefit. The available health-protective benchmarks for Appendix IV constituents (*i.e.* RSLs) and well-established US EPA risk assessment methodology for using or developing more site-specific benchmarks as a basis for GWPS, adequately provides for the long-term protection of human health.

## References

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Agency for Toxic Substances and Disease Registry (ATSDR). 2004. "Toxicological Profile for Cobalt." 486p., April.

Electric Power Research Institute (EPRI). 2006. "Characterization of Field Leachates at Coal Combustion Product Management Sites: Arsenic, Selenium, Chromium, and Mercury Speciation." Report to US Dept. of Energy (US DOE) EPRI 1012578. 192p.

Electric Power Research Institute (EPRI). 2007. "Treatment Technology Summary for Critical Pollutants of Concern in Power Plant Wastewaters." 1012549. 88p.

Herman, SA; Laws, EP. [US EPA, Office of Enforcement and Compliance Assurance; US EPA, Office of Solid Waste and Emergency Response (OSWER)]. 1996. Memorandum to RCRA/CERCLA National Policy Managers, Regions I-X re: Coordination between RCRA corrective action and closure and CERCLA site activities. 6p., September 24. Accessed on April 27, 2017 at <https://www.epa.gov/sites/production/files/2013-10/documents/rcracorrection-mem.pdf>.

Institute of Medicine (IOM). 2001. Dietary reference intakes for vitamin A, vitamin K, arsenic, boron, chromium, copper, iodine, iron, manganese, molybdenum, nickel, silicon, vanadium, and zinc. Standing Committee on the Scientific Evaluation of Dietary Reference Intakes, Food and Nutrition Board. National Academy Press, Washington, DC, 773p. Accessed at [http://www.nal.usda.gov/fnic/DRI//DRI\\_Vitamin\\_A/full\\_report.pdf](http://www.nal.usda.gov/fnic/DRI//DRI_Vitamin_A/full_report.pdf).

US Congress. 2016. "An Act to provide for improvements to the rivers and harbors of the United States, to provide for the conservation and development of water and related resources, and for other purposes [Water Infrastructure Improvements for the Nation Act]." S.612. 277p., January 4. Accessed on April 12, 2017 at <https://www.congress.gov/bill/114th-congress/senate-bill/612/text#toc-H91A0B3DCF1D14C6C92588DDAA897B03B>.

US EPA. 1989. "Risk Assessment Guidance for Superfund (RAGS). Volume I: Human Health Evaluation Manual (Part A) (Interim final)." Office of Emergency and Remedial Response, Washington, DC. NTIS PB90-155581; EPA-540/1-89-002. 287p., December.

US EPA. 1994. "Guidance manual for the Integrated Exposure Uptake Biokinetic Model for Lead in children." Technical Review Workgroup for Lead. Report to US EPA, Office of Emergency and Remedial Response, OERR Publication 9285.7-15-1, EPA 540-R-93-081, NTIS PB93-963510, 1994.

US EPA. 2001. "Risky Business? An Overview of Risk Assessment and RCRA." Office of Solid Waste and Emergency Response (OSWER), EPA530-F-00-032. 4p., February.

US EPA. 2003. "Recommendations of the Technical Review Workgroup for Lead for an approach to assessing risks associated with adult exposures to lead in soil." Technical Review Workgroup for Lead, Report to US EPA, Office of Solid Waste and Emergency Response/Office of Emergency and Remedial Response, EPA-540-R-03-001, OSWER Directive 9285.7-54, January.

US EPA. 2007a. "Framework for Metals Risk Assessment." Office of the Science Advisor. EPA 120/R-07/001. 172p., March. Accessed on March 08, 2011 at <http://www.epa.gov/raf/metalsframework/pdfs/metals-risk-assessment-final.pdf>.

US EPA. 2007b. "National primary drinking water regulations for lead and copper: Short term regulatory revisions and clarifications (Final rule)." *Fed. Reg.* 72(195):57782-57820. 40 CFR 141, 142, October 10.

US EPA. 2008. "Provisional Peer Reviewed Toxicity Values for lithium (CAS No. 7439-93-2)." National Center for Environmental Assessment (NCEA), Superfund Health Risk Technical Support Center, 31p., June 12.

US EPA. 2009. "Contaminant information sheets for the final CCL 3 chemicals." Office of Water, Office of Groundwater and Drinking Water, EPA 815-R-09-012, 216p., August.

US EPA. 2010. "Integrated Exposure Uptake Biokinetic Model For Lead in Children, Windows Version (IEUBKwin v.1.1 Build 11) - 32-Bit Version." February. Accessed on March 21, 2011 at <http://www.epa.gov/superfund/lead/products.htm#ieubk>.

US EPA. 2012a. "Framework for Human Health Risk Assessment to Inform Decision Making (EPA External Review Draft)." Risk Assessment Forum. EPA-601-D12-001. 85p., July 12. <http://epa.gov/raf/files/framework-document-7-13-12.pdf>.

US EPA. 2012b. "2012 edition of the Drinking Water Standards and Health Advisories." Office of Water, EPA 822-S-12-001, 20p., April.

US EPA. 2015a. "Hazardous and solid waste management system; Disposal of coal combustion residuals from electric utilities (Final rule)." *Federal Register*. 80(74), pp. 21302-21501, April 17. 40 CFR Parts 257 and 261.

US EPA. 2015b. "Hazardous and solid waste management system; Disposal of coal combustion residuals from electric utilities (Final rule)." *Fed. Reg.* 80(74):21302-21501. 40 CFR Parts 257 and 261. April 17.

US EPA. 2016a. "Methodology for Evaluating Beneficial Uses of Industrial Non-Hazardous Secondary Materials." Office of Land and Emergency Management, Office of Resource Conservation and Recovery EPA 530-R-16-011. 15p., April.

US EPA. 2016b. "Subpart E - Ground-water monitoring and corrective action: Assessment monitoring program." 40 CFR 258.55. 3p. Accessed on April 27, 2017 at <https://www.gpo.gov/fdsys/pkg/CFR-2016-title40-vol27/pdf/CFR-2016-title40-vol27-sec258-55.pdf>.

US EPA. 2016c. "Regional Screening Levels (RSLs) - user's guide." 124p., May. Accessed at <https://www.epa.gov/risk/regional-screening-levels-rsls-users-guide-may-2016>.

US EPA. 2016d. "Regional Screening Level (RSL) tables (TR=1E-6, HQ=1) (composite tables)." 82p., May. Accessed at [https://www.epa.gov/sites/production/files/2016-06/documents/composite\\_sl\\_table\\_run\\_may2016.pdf](https://www.epa.gov/sites/production/files/2016-06/documents/composite_sl_table_run_may2016.pdf).

US Geological Survey (USGS). 2011. "Trace elements and radon in groundwater across the United States, 1992-2003." USGS Scientific Investigations Report 2011-5059, 131p. Accessed at [https://pubs.usgs.gov/sir/2011/5059/pdf/sir2011-5059\\_report-covers\\_508.pdf](https://pubs.usgs.gov/sir/2011/5059/pdf/sir2011-5059_report-covers_508.pdf).