

Utility Solid Waste Activities Group
c/o Edison Electric Institute
701 Pennsylvania Avenue, NW
Washington, DC 20004-2696
202-508-5645
www.uswag.org

USWAG

BY HAND AND REGISTERED MAIL

March 24, 2009

The Honorable Lisa Jackson, Administrator
U.S. Environmental Protection Agency
Ariel Rios Building, Mail Code: 1101A
1200 Pennsylvania Avenue, NW
Washington, DC 20460

Dear Administrator Jackson:

I write on behalf of the Utility Solid Waste Activities Group (“USWAG”) to respond to some of the inaccurate statements contained in the March 2, 2009 letter that was sent to you by the Environmental Integrity Project and other groups (collectively, “Environmental Integrity”) regarding coal combustion byproducts. USWAG is a trade association of over 100 energy industry operating companies and associations including the Edison Electric Institute (“EEI”) and the National Rural Electric Cooperative Association (“NRECA”). USWAG has worked in a constructive and cooperative manner with EPA for nearly three decades regarding the Agency’s implementation of the Bevill Amendment as applied to coal combustion byproducts.¹ We are aware that you have announced that EPA intends to propose RCRA regulations addressing the management of coal combustion byproducts and we look forward to continuing to work with you and your staff in a constructive manner to that end.

USWAG respects the right of Environmental Integrity or any other group to express its views to EPA regarding the regulatory options for coal combustion byproducts. By its very nature, the rulemaking process involves multiple stakeholders with differing views, but it also depends on providing the Agency with accurate factual information and data. Environmental Integrity’s March 2, 2009 letter falls far short of meeting that standard.

We do not address every misstatement in Environmental Integrity’s letter, though we are confident that EPA’s professional staff, who have been studying the management of coal combustion byproducts for over two decades, can readily identify many of the letter’s inaccuracies. Your commitment to sound science as the driver in setting regulatory policy

¹ EEI is the principal national association of investor-owned electric power and light companies. NRECA is the national association of rural electric cooperatives. Together, USWAG members represent more than 85% of the total electric generating capacity of the U.S., servicing more than 95% of the nation’s consumers of electricity.

depends on factual accuracy. It is important, therefore, that USWAG address some of the major inaccuracies and omissions in Environmental Integrity's submission.

As fully discussed below, contrary to the assertions in the letter:

- EPA has never determined that coal combustion byproducts should be regulated as contingent hazardous wastes; in fact, the Agency made the opposite decision in its regulatory determination for coal combustion byproducts in 2000;
- EPA's draft risk assessment does not present documented health risks associated with coal combustion byproducts; the assessment is a draft study reflecting an incomplete scientific analysis which has been subject to mixed reviews of independent, expert peer reviewers and does not make any final scientific conclusions regarding the risks associated with coal combustion byproducts;
- The 2006 joint EPA/DOE Report demonstrates that increasing percentages of coal combustion byproducts are being beneficially used, State disposal controls are becoming more robust, and the vast majority of newer coal combustion byproduct disposal facilities have liners and groundwater monitoring;
- EPA's Office of Research Development studies evaluating the higher metal content in combustion residuals resulting from enhanced emission controls show that total metal content in the residuals is *not* a good indicator of potential leaching; and
- Rather than "back pedaling" and engaging in a "waiting game" over the past nine years, EPA staff has responded to numerous requests by environmental organizations to conduct and fund meetings, hearings, and studies on coal combustion byproducts; during this period, it has updated its information on coal combustion byproduct management practices and State solid waste regulatory controls for these materials.

DISCUSSION

1. Environmental Integrity Falsely States that EPA Has Determined that Coal Combustion Byproducts Should Be Regulated as Contingent Hazardous Wastes – Environmental Integrity states in its letter that "[t]he Agency first recognized coal ash to be a contingent hazardous waste requiring safe standards for disposal in the regulatory determination dated March 5, 2000, which it posted on its website. That decision was based on years of study, and over the past decade, the evidence to support federal standards has continued to accumulate." Environmental Integrity letter at 3. This statement is patently incorrect.

Environmental Integrity's Letter is false in two respects. The first inaccuracy is the statement that EPA issued a regulatory determination recognizing coal combustion byproducts to

be a contingent hazardous waste when, in reality, EPA not only did no such thing, it did precisely the opposite. Also false is the statement that this “determination” constituted a “decision” by EPA.

The document Environmental Integrity refers to was an internal EPA working *draft* prepared by staff as an alternative to the tentative conclusion submitted in EPA’s Report to Congress in March 1999 that these materials should not be regulated as hazardous waste under Subtitle C of RCRA. That draft was never signed by any EPA official, and was never published by EPA in the Federal Register.

The more serious lapse on Environmental Integrity’s part is its failure to disclose that EPA took the *opposite* position in its regulatory determination for coal combustion byproducts published on May 22, 2000 (65 Fed. Reg. 32214). In that determination, EPA concluded that coal combustion byproducts “do *not* warrant regulation under subtitle C of RCRA.” *Id.* at 32214 (emphasis added). Indeed, EPA acknowledges in its actual determination that it evaluated the so-called “contingent hazardous waste approach,” but concluded that the better approach to ensure the adequate management of coal combustion byproducts was “to develop national regulations under subtitle D rather than subtitle C.” *Id.* at 32216. EPA concluded “that subtitle D [non-hazardous waste] regulations are the most appropriate mechanism for ensuring that these wastes disposed of in landfills and surface impoundments are managed safely.” *Id.* at 32221.

State environmental regulatory agencies have continually supported EPA’s conclusion that coal combustion byproducts do not warrant hazardous waste regulation. Just last year, the Environmental Council of the States (“ECOS”) issued a Resolution agreeing with EPA that the disposal of coal combustion byproducts does not warrant hazardous waste regulation (ECOS Resolution 08-14 at 2 (Att. 1)). *See also* Comments of The Association of State and Territorial Solid Waste Management Officials on EPA’s Notice of Data Availability on the Disposal of Coal Combustion Wastes in Landfills and Surface Impoundments (EPA-HQ-RCRA-2006-0796) (urging non-hazardous waste controls if EPA is to pursue federal regulations). The States are especially concerned that hazardous waste regulation of coal combustion byproducts would threaten the survival of the growing market for beneficial use of these materials, a concern EPA also expressed in its 2000 regulatory determination. *See* 65 Fed. Reg. at 32232. Indeed, last week, the State of Iowa sent a letter to EPA urging it *not* to regulate coal combustion byproducts as hazardous waste, explaining that such regulation is not supported by the data, and cautioning that such action “has the potential to put an end to many beneficial uses” for coal combustion wastes. *See* Letter from Iowa Department of Natural Resources to EPA, March 19, 2009 (Att. 2).

2. Environmental Integrity Inappropriately Suggests that EPA’s Draft Risk Assessment Presents Documented Findings – Environmental Integrity states that “EPA’s 2007 Human and Ecological Risk Assessment from Coal Combustion Wastes “documented the highest cancer risks from surface impoundments” and also “found unacceptable health risks from clay-lined

coal combustion waste landfills leaching arsenic into groundwater”. Environmental Integrity letter at 1-2. These allegations are based on an incomplete scientific analysis. What Environmental Integrity does not reveal when describing the assessment is that it is a *draft* document which expressly states on every page “Do not cite or quote.” This admonition is included for good reason. EPA has sought public comment on the draft and is subjecting the draft to an independent peer review by outside experts. The comments, including those by the peer reviewers, include significant criticisms of the draft results. It is improper for Environmental Integrity to claim that this “work in progress” makes definitive findings with respect to risks from coal combustion byproducts.

A general point acknowledged by the independent, expert peer reviewers about the draft assessment was “the difficulty of identifying and characterizing the human and ecological risks of an activity being conducted on a national level, considering the site-specific nature of risk assessment and the diversity of site conditions nationwide.” *See* Memorandum to Thea Johnson, EPA from Industrial Economics, Inc. (Sept. 25, 2008) (Executive Summary at 3, Att. 3). A peer reviewer also cautioned against misusing the draft because it was based on information collected before 1995, and did not consider the newer data assembled in the EPA/DOE Report demonstrating that “the proportion of lined landfills appears to have changed significantly between the 1995 data and the subsequent U.S. DOE (2006) study.” *See* Comments by Dr. R. Kerry Rowe on Draft Risk Assessment at 2. Another common theme of the peer reviewers was that “the dearth of site-specific information in the risk assessment” was “a weakness in the analysis.” *Id.* at 4. Given the “identification of shortfalls and limitations in the analysis,” the peer reviewers came to different conclusions; some believed the draft assessment could lead to “an overestimation of risk,” while others suggested that it could “underestimate risk.” Executive Summary at 3.

3. Environmental Integrity Mischaracterizes Annual CCB Management Practices – In the second sentence of the letter, Environmental Integrity states, without any supporting reference, that “[n]early a hundred million tons of toxic coal ash and related combustion wastes pile up in unlined ponds and pits across the United States every year.” Environmental Integrity letter at 1. This statement is grossly misleading. Environmental Integrity ignores the facts that a significant and growing percentage of coal combustion byproducts generated each year are never disposed of and instead are beneficially used, and that the vast majority of newer coal combustion byproduct management units that have come on-line since 1994 have liners and groundwater monitoring and are not “unlined ponds and pits.”

The most recent, comprehensive study on coal combustion byproduct management practices, entitled “Coal Combustion Waste Management at Landfills and Surface Impoundments, 1994 – 2004 (DOE/PI-004)” (“EPA/DOE Report”) was conducted jointly by EPA and the Department of Energy and is cited extensively in Environmental Integrity’s letter. Apart from finding that “[b]etween 1994 and 2004, the amount and quality of environmental controls at CCW [coal combustion wastes] management units appear to have increased” (*id.* at S-

5), the Report found that “[s]ignificant amounts of CCW are used beneficially,” observing that the most “common beneficial application of CCW is the use of fly ash as a partial substitute for Portland cement in concrete.” *Id.* at 4. In fact, the American Coal Ash Association reported that in 2007, the most recent year for which coal combustion byproduct production and use data are available, more than 56 million tons of the 131 million tons of coal combustion byproducts were beneficially utilized. American Coal Ash Association, “2007 Coal Combustion Product (CCP) Production and Use Survey Results.”

EPA itself has extolled the benefits of the beneficial use of coal combustion byproducts, explaining that it “reduces GHG [green house gas] emissions, and reduces the need for land disposal.” Testimony for the Record, U.S. Environmental Protection Agency Committee on Environment and Public Works United States Senate, (Jan. 8, 2009) at 8 (copy Att. 4). EPA explained that the United States saved nearly 73 trillion BTUs of energy – equivalent to the annual energy consumption of more than 676,000 households – by recycling 13.7 million tons of fly ash in 2007 in place of Portland cement, resulting in reduced GHG emissions of 12.4 million metric tons of CO₂. *Id.*

The DOE/EPA Report also examined coal combustion byproduct landfills and surface impoundments that were permitted, built, or laterally expanded between 1994 and 2004. The Report found a trend towards dry handling of CCWs, with about two-thirds of newly expanded or built units being landfills. *Id.* at 21-22. Equally important is DOE/EPA’s finding that the vast majority (98%) of new and expanded landfills and surface impoundments have liners and the vast majority (91%) of new and expanded landfills and surface impoundments have groundwater monitoring. *Id.* at 31, 34.

4. Environmental Integrity Mischaracterizes the Conclusions from EPA Studies Examining the Composition of Coal Combustion Byproducts – Environmental Integrity mischaracterizes the results of two EPA Office of Research and Development (“ORD”) studies assessing the potential leaching characteristics of coal combustion byproducts generated from power plants using enhanced emission controls. Environmental Integrity states that ORD “has recognized that air pollution controls will transfer even larger quantities of heavy metals in ash, scrubber sludge, or other combustion wastes, and that these will be dumped into impoundments or landfills that are not designed to contain toxic waste.” Environmental Integrity letter at 4.

Environmental Integrity’s statement incorrectly implies that the higher metal content in coal combustion byproducts will result in more leaching of the metals. This suggestion is not supported by the ORD studies. In fact, the studies caution precisely *against* drawing such a conclusion, stating explicitly that “it is not recommended to base landfill management decisions on total content of constituents in CCRs [coal combustion residues] since total content does not consistently relate to quantity released.” See “Characterization of Mercury-Enriched Coal Combustion Residues from Electric Utilities Using Enhanced Sorbents for Mercury Control,” EPA-600/R-06/008, at xiv (Feb. 2006); see also “Characterization of Coal Combustion Residues

from Electric Utilities Using Wet Scrubbers for Multi-Pollutant Control,” EPA-600/R-08/077, at xviii (July 2008) (“ORD Wet Scrubber Study”) (“Leaching concentrations do not correlate with total content except for specific constituents in selected materials where the constituent (i) is weakly retained, *and* (ii) leaching concentration have a low variability relative to pH. Thus, total content is not a good indicator of leaching.” (emphasis in original)).

Nor do the ORD studies support the conclusion that coal combustion byproducts will be “dumped” into units that are not designed to contain these materials. Neither ORD study assesses the capability of any unit to safely manage coal combustion byproducts or draws any conclusion supporting the assertion that these materials will be “dumped” into unsafe landfills or impoundments. The two ORD studies are intended to evaluate the potential changes in leaching characteristics of coal combustion byproducts resulting from specified emissions technologies. The two reports are the first of a series of four EPA reports, the final of which will “provide a probabilistic assessment of the leaching potential of mercury and other [constituents of potential concern] based on plausible management strategies. *See* ORD Wet Scrubber Study at xviii (July 2008). Regulatory policy issues regarding coal combustion management strategies is intended to be addressed in the final EPA report, the draft of which reportedly is scheduled for publication in the Spring of 2010. *See* EPA Presentation on “Improved Leach Testing to Evaluate Fate of Hg and other Metals from Management of Coal Combustion Residues,” EPA-A&WMA Technical Information Exchange, Research Triangle Park, NC (Dec. 2-3, 2008).

5. Environmental Integrity Wrongly Accuses EPA of “Backpedaling” and Delay – A constant refrain in Environmental Integrity’s letter is that, since the 2000 Regulatory Determination, EPA has been engaged in “counterproductive backpedaling” and a “waiting game” with respect to deciding whether and how to develop a federal regulatory program for coal combustion byproducts. *See* Environmental Integrity letter at 1, 4. This characterization is inaccurate and unfair, especially given that over the course of the past nine years EPA has responded to multiple requests by various organizations to conduct and fund meetings, hearings, and studies to allow additional evaluation of management practices, beyond those already evaluated in the 2000 determination.

For example, at the request of various environmental organizations, EPA conducted a public meeting in Washington, D.C. in 2003 to hear the concerns of groups regarding the management of coal combustion byproducts. These groups believed that a Washington, D.C. hearing was insufficient and requested a series of hearings around the country. In response, EPA conducted four “Listening Sessions” in 2004 in Pennsylvania, Indiana, and Texas to receive the testimony of environmental organizations, local citizens, industry representatives, state regulators, and academics. *See* 69 Fed. Reg. 9825 (March 2, 2004).

In 2004, at the urging of certain groups opposed to mine placement of coal combustion byproducts, Congress directed EPA to fund a study of mine placement by the National Academy of Sciences/National Research Council (“NRC”). That study took nearly a year and a half to

Hon. Lisa Jackson, Administrator
March 24, 2009
Page 7

complete and resulted in a 2006 report that concluded, among other things, that “enforceable federal standards be established for the disposal of [CCPs] in minefills” and that the scope of the preexisting Surface Mining Control & Reclamation Act (“SMCRA”) “is broad enough to encompass such regulation during reclamation activities.” NRC, *Managing Coal Combustion Residues in Mines*, p. 11 (March 1, 2006) (“NRC Report”).

In view of the new data collected by EPA during this time period, the Agency appropriately issued a Notice of Data Availability (“NODA”) in 2007 seeking public comment “on how, if at all, this additional information should affect the Agency’s decisions as it continues to follow-up on its Regulatory Determination for CCW disposed of in landfills and surface impoundments.” 72 Fed. Reg. 49714 (Aug. 29, 2007). Environmental organizations, including some who are signatories to the Environmental Integrity letter, requested and received two extensions on the NODA comment period. *See* 73 Fed. Reg. 6723 (Feb. 5, 2008). Thus, far from engaging in a “waiting game” since 2000, EPA has actively responded to requests by organizations to collect additional data on coal combustion byproduct management practices, and has also joined with DOE to update its records regarding the improving trends in State coal combustion byproduct disposal regulations and coal combustion byproduct management practices.

* * * * *

Any regulatory decision involving coal combustion byproducts demands adherence to the facts and sound science. We look forward to meeting with you in the near future to discuss these important issues and to working with EPA staff as the Agency continues to develop a sound regulatory program for coal combustion byproducts. In the meantime, please call me if you have questions regarding the points raised in this letter (202-508-5645).

Sincerely,



James R. Roewer, Executive Director
Utility Solid Waste Activities Group

Attachments

cc: Barry Breen, EPA
Matt Hale, EPA
Robert Dellinger, EPA

ATTACHMENT 1



Resolution 08-14
Approved September 22, 2008
Branson, Missouri

As certified by
R. Steven Brown
Executive Director

THE REGULATION OF COAL COMBUSTION PRODUCTS

WHEREAS, The 1980 Bevill Amendment to the Resource Conservation and Recovery Act (RCRA) requires the U.S. Environmental Protection Agency (USEPA) to "conduct a detailed and comprehensive study and submit a report" to Congress on the "adverse effects on human health and the environment, if any, of the disposal and utilization" of fly ash, bottom ash, slag, flue gas emission control wastes, and other byproducts from the combustion of coal and other fossil fuels and "to consider actions of state and other federal agencies with a view to avoiding duplication of effort"; and

WHEREAS, USEPA conducted the comprehensive study required by the Bevill Amendment and reported its findings to Congress on March 8, 1988 and on March 31, 1999, and in both Reports that recommended that coal combustion wastes (CCW) not be regulated as hazardous waste under RCRA Subtitle C; and

WHEREAS, on August 9, 1993, USEPA published a regulatory determination that regulation of the four large volume coal combustion wastes (fly ash, bottom ash, boiler slag, and flue gas emission control waste) as hazardous waste under RCRA Subtitle C is "unwarranted"; and

WHEREAS, on May 22, 2000, USEPA published a final regulatory determination that fossil fuel combustion wastes, including coal combustion wastes, "do not warrant regulation [as hazardous waste] under Subtitle C of RCRA," and that "the regulatory infrastructure is generally in place at the state level to ensure adequate management of these wastes"; and

WHEREAS, USEPA is under no statutory obligation to promulgate federal regulations applicable to CCW disposal following the regulatory determination that hazardous waste regulation of CCW disposal is not warranted, and throughout the entire Bevill regulatory process, CCW disposal has remained a state regulatory responsibility and most of the states have developed and implemented robust regulatory programs tailored to the wide-ranging circumstances of CCW management throughout the country; and

WHEREAS, In 2005, USEPA and the U.S. Department of Energy (DOE) published a study of CCW disposal facilities constructed or expanded since 1994 and evolving state regulatory programs that found: state CCW regulatory requirements have become more stringent in recent years, the vast majority of new and expanded CCW disposal facilities have state-of-the-art environmental controls, and deviations from state regulatory requirements were being granted only on the basis of sound technical criteria; and

WHEREAS, the states have demonstrated a continuing commitment to ensure proper management of CCWs and several states have announced proposals for revising and upgrading their state CCW regulatory programs.

NOW, THEREFORE BE IT RESOLVED THAT THE ENVIRONMENTAL COUNCIL OF THE STATES:

Agrees with USEPA's assessment that CCW disposal does not warrant regulation as hazardous wastes under RCRA Subtitle C; and

Agrees with USEPA's finding in the 2005 study previously cited that "the regulatory infrastructure is generally in place at the state level to ensure adequate management of these wastes" and believes that states should continue to be the principal regulatory authority for regulating CCW as they are best suited to develop and implement CCW regulatory programs tailored to specific climate and geological conditions designed to protect human health and the environment; and

Supports safe, beneficial reuse of CCW, including for geotechnical and civil engineering purposes; and

Believes that the adoption and implementation of a federal CCW regulatory program would create an additional level of resources and oversight that is not warranted, would be duplicative of existing state regulatory programs, and require additional resources to revise or amend existing state programs to conform to new federal regulatory programs and to seek USEPA program approval; and

Therefore calls upon USEPA to conclude that additional federal CCW regulations would be duplicative of most state programs, are unnecessary, and should not be adopted, and instead, calls upon EPA to begin a collaborative dialogue with the states to develop and promote a national framework for beneficial use of CCW including use principles and guidelines, and to accelerate the development of markets for this material.

ATTACHMENT 2



STATE OF IOWA

CHESTER J. CULVER, GOVERNOR
PATTY JUDGE, LT. GOVERNOR

DEPARTMENT OF NATURAL RESOURCES
RICHARD A. LEOPOLD, DIRECTOR

March 19, 2009

MR MATT HALE, DIRECTOR
OFFICE OF RESOURCE CONSERVATION AND RECOVERY
US ENVIRONMENTAL PROTECTION AGENCY
1200 PENNSYLVANNIA AVE NW
WASHINGTON DC 20460

RE: EPA Regulation of Coal Combustion Waste

Dear Mr. Hale:

On behalf of the Iowa Department of Natural Resources (IDNR) and our director we want to express our thanks for the opportunity to provide comments to EPA while you are still vetting options. Since 90% of the electricity in Iowa is generated by coal-burning facilities, the issue of regulating the beneficial use and disposal of coal combustion waste (CCW) has serious implications to our state. We have looked at EPA's proposed regulatory scenarios and it is IDNR's position that the EPA should approach CCW regulations similar to the approach that is taken with municipal solid waste under 40 CFR Part 258, commonly referred to as RCRA Subtitle D. Using the lessons learned by states since the adoption of 40 CFR Part 258 and historical CCW data collected by states, RCRA Subtitle D could be modified to specifically address CCW waste disposal facility requirements and is the framework that the EPA should build upon.

The Department understands that the EPA is considering options to regulate CCW as a hazardous waste under RCRA Subtitle C. This option is not supported by the historic data that has been collected from generators of CCW in Iowa which shows that CCW does not exceed RCRA Subtitle C hazardous waste characteristics. Regulation under RCRA Subtitle C also has the potential to put an end to many beneficial uses for CCW. In most states, a primary requirement for a beneficial use determination is that the waste not be hazardous. Most importantly, declaring CCW a hazardous waste creates an even greater hardship in Iowa because of the amount that is generated and the fact that there is no RCRA C permitted disposal facilities in the state. The likelihood of siting such a facility borders on the impossible. The implications of this action are that CCW generators would be forced to ship materials to surrounding states for disposal. That could become very costly for Iowans and extremely difficult to justify when there is little scientific data supporting such drastic measures.

IDNR looks forward to continued conversations and involvement with EPA on CCW regulation through ASTSWMO. Again, we want to express our appreciation for the opportunity to provide input. Should you have any questions specific to our comments or need relevant data pertaining to CCW generated in Iowa, please do not hesitate to contact me at (515) 281-8927 or Alex Moon at (515) 281-6807 or alex.moon@dnr.iowa.gov.

502 EAST 9th STREET / DES MOINES, IOWA 50319-0034
PHONE 515-281-5918 FAX 515-281-8895 www.iowadnr.gov

Sincerely,

A handwritten signature in black ink that reads "Brian Tormey". The signature is written in a cursive style with a long, sweeping tail on the letter "y".

Brian Tormey, Chief
Land Quality Bureau
Environmental Services Division

Cc: Richard Leopold, Director, IDNR
Wayne Gieselman, Administrator, Environmental Services Div., IDNR
Alex Moon, Land Quality Bureau, IDNR
Mary Zdanowicz, Executive Director, ASTSWMO
Don Toensing, US EPA, Region VII

ATTACHMENT 3



MEMORANDUM | September 25, 2008

TO Thea Johnson; U.S. EPA, Office of Solid Waste
FROM Christopher Lewis and Mark Ewen, Industrial Economics, Incorporated
SUBJECT Peer review of “Draft Human and Ecological Risk Assessment of Coal Combustion Wastes”

The U.S. Environmental Protection Agency, (EPA), as part of its Regulatory Determination concerning the potential regulation of the land placement of coal combustion wastes (CCW) under subtitle D of RCRA, prepared an analysis characterizing the human and ecological risks associated with land placement of these materials. Specifically, in August of 2007, EPA released the “Draft Human and Ecological Risk Assessment of Coal Combustion Wastes” document (Risk Assessment) as part of a Notice of Data Availability. The purpose of the notice was to seek public input and stakeholder comment on information being considered for the Regulatory Determination. EPA received extensive public comments on the Risk Assessment.

Subsequently, EPA retained Industrial Economics, Incorporated (IEc) to conduct an independent peer review of the Risk Assessment. This memorandum presents a brief description of the peer review process and the results of the peer review. Each of the individual reviews by the peer reviewers, as well as a copy of all materials sent to each of the peer reviewers, are included as attachments to this memorandum.¹

**THE PEER
REVIEW PROCESS**

IEc conducted the review in accordance with the Peer Review Handbook, published by EPA (third edition, June 2006). Our management of the review consisted of the following general activities:

- Identified areas of expertise necessary for a scientifically rigorous review.
- Identified a list of candidate expert peer reviewers.
- Evaluated the expertise of each of the candidate expert peer reviewers.
- Created a short-list of 10 candidate expert peer reviewers.
- Determined the interest and availability of the short-list of candidate expert peer reviewers.
- Determined for each of the remaining short-listed candidate peer reviewers any potential conflict of interest or lack of impartiality, or the appearance of any potential conflict of interest or lack of impartiality; excluding candidates with either.

¹ Given the volume of supporting materials, we provide them in a separate attachment packet.

- Finalized a team of five expert peer reviewers.
- Developed charge questions in conjunction with EPA for the conduct of the review.
- Initiated the review.
- Managed a public teleconference to allow members of the public and/or stakeholders to submit oral comments for consideration by the expert peer reviewers.
- Coordinated with the peer reviewers to finalize their written reviews.

This review was conducted as a letter review. Each of the reviewers was provided with a copy of the Risk Assessment, a copy of all public comments made during the NODA public comment period (and a transcript of the peer review teleconference), a supporting document for the Risk Assessment entitled “Characterization of Infiltration Rate Data to Support Groundwater Modeling Efforts”, and charge questions. A copy of all materials provided to the expert peer reviewers is included as an addendum to this memorandum.

In seeking candidates to serve as expert peer reviewers, as well as in our selection of the final team of reviewers, we made an effort to include individuals with expertise in one or more of the areas outlined in Exhibit 1.

EXHIBIT 1 AREAS OF EXPERTISE SOUGHT IN POTENTIAL PEER REVIEWERS

KNOWLEDGE AREA	DESCRIPTION
Exposure and Risk Assessment	Knowledge of the methods and approaches to conducting human health and/or ecological exposure and risk assessments, including experience creating or reviewing exposure and risk assessment documents
Management of Coal Combustion Waste	Knowledge of the sources, chemical behavior, contaminants, and disposal of coal combustion waste products
Probabilistic Risk Techniques	Knowledge of the methods used and approaches to employing statistical and analytical tools that incorporate probability in the assessment of risk, including the use of Monte-Carlo type distribution analysis
Metals Assessment	Knowledge of the methods and approaches of quantifying concentrations of metals in various environmental media, as well as an understanding of the human health and environmental effects, and the fate and transport of metals in the environment
Groundwater Modeling	Knowledge of the methods used and approaches to modeling the fate and transport of contaminants in groundwater, as well as the effects of soil properties on groundwater movement

Our final team of expert reviewers consisted of the following individuals:

- Dr. Nicholas Basta, Ohio State University;
- Dr. Charles Harvey, Massachusetts Institute of Technology;
- Dr. William Hopkins, Virginia Polytechnic Institute and State University;
- Dr. Kerry Rowe, Queens University; and
- Dr. Donna Vorhees, The Science Collaborative.

Each of the reviewers was allowed six to eight weeks after the public teleconference (held in July 2008) to complete his or her review. Upon receipt of the letter reviews, we read through each of them and clarified any inconsistencies and corrected any typographical errors with the assistance of the reviewer, and finalized the reviews. A brief summary of the major findings and points of interest from the reviews are included below. Each of the final reviews is included as an attachment to this memorandum.

**MAJOR FINDINGS
AND POINTS OF
INTEREST**

Due to the different areas of expertise of each of the expert reviewers, a variety of viewpoints are expressed in the reviews. In general, the reviewers tended to comment more extensively on those aspects of the Risk Assessment that were within the purview of their area(s) of expertise. Specifically, the foci of the reviewers, as expressed in their reviews, are indicated below.

- Dr. Nicholas Basta focused on the overall risk assessment approach, including the use of methods and parameters used in geochemical modeling.
- Dr. Charles Harvey focused on the use of probabilistic approaches employed in the analysis in the context of fate and transport of contaminants in the environment.
- Dr. William Hopkins focused on ecological impacts as they were addressed in the analysis.
- Dr. Kerry Rowe focused on the relationship between the use of landfill liners and the analytical approach.
- Dr. Donna Vorhees focused on the adequacy of the human health risk assessment approach in the context of requirements for proper conduct of probabilistic risk assessments.

Following is a set of general summary points.

- Each of the reviewers acknowledged the difficulty of identifying and characterizing the human and ecological risks of an activity being conducted on a national level, considering the site-specific nature of risk assessment and the diversity of site conditions nationwide.

- In general, the reviewers thought that the Risk Assessment made good use of available data, but each of the reviewers identified shortfalls or limitations of the analysis. A complete and accurate characterization of these shortfalls and limitations is best conveyed by reading the individual reviews; we do not attempt to distill or enumerate them all here. In most circumstances, the reviewers offered suggestions about how to improve upon the analysis.
- A number of common themes were present across the reviews. For example, the dearth of site-specific information in the risk assessment was uniformly identified as a weakness in the analysis. In addition, the reviewers agreed that insufficient background information was provided in the Risk Assessment (e.g., input data used for modeling) to allow for a full evaluation of the analytical approach, or to allow a reader to reconstruct the analysis. In addition, a common theme among several of the reviewers was that uncertainty and variability were not discussed separately, or to the extent that they would have liked to have seen.
- Given the identification of shortfalls and limitations in the analysis, the reviewers came to different conclusions about how the analytical approach would affect estimates of risk in the report. For example, Dr. Basta indicated that the ecological benchmarks used were overly protective, leading to an overestimation of risk. In contrast, Dr. Hopkins suggested that the focus on exposure scenarios dealing with leachate-affected surface water, as opposed to scenarios dealing with direct exposure to leaching pond water, was an approach that would underestimate risk.
- There was a general consensus that data used in the analysis should be updated to reflect more recent information. Although the reviewers expressed general approval of the Risk Assessment, a number of the reviewers qualified their general support of the analysis with the caveat that the analysis would need to be updated.

LIST OF ATTACHMENTS Following is a list of attachments to this memorandum.

- Expert peer reviews.
 - Review by Dr. Nicolas Basta
 - Review by Dr. Charles Harvey
 - Review by Dr. William Hopkins
 - Review by Dr. Kerry Rowe
 - Review by Dr. Donna Vorhees
- Peer review materials (provided in separate packet).
 - Cover letter to reviewers

- Charge Questions
- Risk Assessment Document
- Additional Materials: Characterization of Infiltration Rate Data
- Written public comments provided to EPA during NODA public comment period and transcript of public teleconference
- Transcript of the peer review teleconference

ATTACHMENT 4

**TESTIMONY FOR THE RECORD
U.S. ENVIRONMENTAL PROTECTION AGENCY
COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS
UNITED STATES SENATE**

January 8, 2009

Madam Chairman and members of the Committee, thank you for the opportunity to provide testimony on the U.S. Environmental Protection Agency's (EPA's) role in the response to the recent release of coal ash from the Tennessee Valley Authority (TVA) Kingston Fossil Plant in Harriman, Roane County, Tennessee. In addition to a description of the actions EPA has taken as part of the response to this release, the testimony also discusses EPA's regulatory efforts regarding the management of coal ash in landfills and surface impoundments, such as the surface impoundment that was the source of the recent release in Tennessee. The testimony concludes with information on EPA's efforts to encourage the beneficial use of coal ash: a set of practices which are yielding significant environmental and economic benefits, including reducing greenhouse gas (GHG) emissions to the environment, as well as the need for land disposal of coal ash.

Response to Kingston Coal Ash Release

On December 22, 2008, at 1:00 a.m., a retaining wall in a surface impoundment at the TVA Kingston Fossil Plant breached, causing the release of an estimated 5.4 million cubic yards of fly ash to the Emory and Clinch Rivers and surrounding areas. The release extended over approximately 300 acres outside the ash storage area. The breached impoundment was one of three impoundments at the facility used for settling the fly ash and discharging the water that was

used to transport the fly ash to the disposal site. The initial release of material from the plant's surface impoundment created a wave of water and ash that destroyed three homes, disrupted electrical power, ruptured a natural gas line in a neighborhood located adjacent to the plant, covered railway and roadways, and necessitated the evacuation of a nearby neighborhood.

Shortly after learning of the release, EPA deployed an On-Scene Coordinator to the site of the TVA Kingston Fossil Plant coal ash release. EPA joined TVA, the Tennessee Department of Environment and Conservation (TDEC), the Roane County Emergency Management Agency, and the Tennessee Emergency Management Agency (TEMA) in a coordinated response (i.e., unified command in the National Incident Management System). EPA is providing oversight, as well as technical advice, for the environmental response portion of TVA's activities. TVA has conducted extensive environmental sampling and shared results with EPA personnel. As discussed in more detail below, EPA staff and contractors have also conducted extensive sampling and air monitoring to evaluate public health and environmental threats. In addition to providing information on environmental conditions at the site, EPA's data have also served as an independent verification of the validity of the TVA data.

EPA sampling has included: surface waters of the Clinch and Emory Rivers, municipal water supply intakes, and finished water (distributed from the water treatment plant) from potentially impacted public water systems, soils, private drinking water wells, and coal ash. EPA also monitored airborne particulate levels in areas of ash deposition. The multimedia data will be used to determine appropriate response measures that are protective of the environment and human health.

In the days following the breach, EPA and TVA jointly sampled multiple locations along the Clinch and Emory Rivers. Those sampling efforts detected heavy metals known to be contained in coal ash in the Clinch and Emory Rivers. Concentrations measured on December 23, 2008 near the intake of the Kingston Water Treatment Plant (WTP) were below federal Maximum Contaminant Levels (MCL) for drinking water with the exception of elevated thallium levels. Subsequent EPA testing on December 30, 2008 of samples at the same intake found that concentration levels for thallium had fallen below the MCL. On December 29, 2008, and again during the December 30, 2008 sampling event, EPA sampled the finished water at the Kingston WTP. These samples met all MCLs, as well. Additional testing conducted during the December 30th sampling event confirmed that samples from the Cumberland and Rockwood WTPs did not exceed any MCLs. A regular sampling program implemented by TDEC at Kingston WTP is in place.

Some residents near the site rely on private wells as their source of drinking water. EPA identified and sampled several potentially impacted residential wells in the immediate area on December 30, 2008. No contaminants above MCLs were detected. In coordination with EPA testing, TDEC offered to sample all residential wells within a four-mile radius of the facility. As of January 5, 2009, TDEC had sampled 27 residential wells. Results from 20 of these wells is complete, and all 20 wells met the MCLs. Results from the remaining seven are expected soon. Well sampling is a voluntary process that must be initiated by each resident, and TDEC continues to receive (and accommodate) sampling requests.

EPA and TVA recognize that windblown ash poses a potential risk to public health. With EPA oversight, TVA commenced air monitoring for coarse (10 microns in size) and fine (2.5

microns in size) particulate matter (PM₁₀ and PM_{2.5}, respectively). Concurrently, EPA commenced independent monitoring for PM₁₀ and PM_{2.5} to validate TVA's findings. To date, particulate levels in the air have measured below the National Ambient Air Quality Standards for these parameters. TVA has constructed five air monitoring stations in residential neighborhoods surrounding the site and developed a strategy for air monitoring throughout the duration of the clean up.

TVA also obtained several air samples on TVA property to measure potential levels of specific contaminants of concern in the air. No constituents were detected with the exception of silica in a single sample. After consultation with the Agency for Toxic Substances and Disease Registry (ATSDR), the level of silica detected was determined not to pose an imminent threat to public health.

While protection of public health and safety is the primary concern during the initial phase of emergency response, EPA's mission also calls for protection of the environment (including, the long-term ecological health of the Emory and Clinch Rivers). As part of its initial response, TVA constructed a rock weir across the Emory River to minimize sediment transport; a second weir is in the design phase. A detailed ecological assessment will determine appropriate future actions. EPA will continue to work with TDEC and TVA on the long term remediation effort

Regulation of Coal Ash Surface Impoundments

Wastewater discharges from surface impoundments are regulated by National Pollutant Discharge Elimination System (NPDES) permits that incorporate both technology-based requirements (i.e., effluent limitations guidelines) and water-quality based effluent limits. The effluent guidelines for steam electric power plants were last issued in 1982 and are codified in Part 423 of the Code of Federal Regulations (40 CFR part 423).

Since 2005, EPA has been carrying out an intensive review of wastewater discharges from coal-fired power plants to determine whether new Clean Water Act regulations are needed. As part of this effort, EPA has sampled wastewater from surface impoundments and advanced wastewater treatment systems, conducted on-site reviews of the operations at more than two dozen power plants, and issued a detailed questionnaire to thirty power plants using authority granted under section 308 of the Clean Water Act. EPA's data collection efforts are primarily focused on three target areas: (1) identifying treatment technologies for the wastewater generated by newer air pollution control equipment; (2) characterizing the practices used by the industry to manage or eliminate discharges of fly ash and bottom ash wastewater; and (3) identifying methods for managing power plant wastewater that allow recycling and reuse, rather than discharge to surface waters. We've engaged in extensive dialogue with our state partners to hear their views and ensure their concerns about power plant discharges are taken into account.

In August 2008, EPA published an interim report describing the status of the detailed study and findings to date. Much of the information EPA had collected, including the laboratory data from sampling and the questionnaire data were made available to the public. The study is

still in progress and in December 2008 EPA received the laboratory results from its most recent sampling event. Upon completion of the study this year, EPA will determine whether the current national effluent limitations guidelines for power plants need to be updated. EPA's interim study report, "*Steam Electric Power Generating Point Source Category: 2007/2008 Detailed Study Report*," can be found online at <http://epa.gov/waterscience/guide/304m/2006/steam-interim.pdf>.

EPA is also currently considering potential regulatory approaches under the Resource Conservation and Recovery Act (RCRA). In May 2000, EPA issued a "Regulatory Determination on Wastes from the Combustion of Fossil Fuels," which conveyed EPA's determination that coal combustion wastes, including coal ash, did not warrant regulation as hazardous waste under Subtitle C of RCRA. However, EPA also concluded that these wastes did warrant federal regulation as non-hazardous wastes under Subtitle D of RCRA and based this determination on the following findings: 1) the constituents present in these wastes include toxic metals that could present a danger to human health and the environment under certain conditions; 2) EPA identified 11 documented cases of proven dangers to human health and the environment through the improper management of these wastes in landfills and surface impoundments; 3) many sites managing these wastes lack controls, such as liners and groundwater monitoring; and 4) while state regulatory programs had shown improvement, gaps in state oversight existed. EPA also determined that beneficial uses of these wastes, such as the use of coal ash as a constituent in concrete, posed no significant risk and did not require additional federal regulation, except for possibly the placement of coal combustion products (CCPs) in minefill operations.

EPA based the May 2000 Regulatory Determination on information collected prior to 1995. Since the determination, EPA collected new information and conducted additional analyses that it believed should be considered as part of its evaluation regarding the development of regulations for the management of coal combustion waste in landfills and surface impoundments. Thus, in August 2007, EPA made this information available for public comment through a Notice of Data Availability (NODA, 65 FR 32214). In response to public requests, EPA extended the comment period on the NODA twice. The second extension for comments closed on February 11, 2008. EPA received close to 400 comments in response to this NODA.

The August 2007 NODA solicited comment on three documents – an updated EPA risk assessment characterizing potential human and ecological risks associated with the placement of coal combustion wastes in surface impoundments and landfills, an updated report on damage cases associated with disposal of coal combustion wastes, and a DOE-EPA survey of more recent disposal practices; in addition the NODA made available for comment alternative regulatory approaches recommended by a consortium of environmental groups and by industry. After the conclusion of the comment period on the August 2007 NODA, EPA commissioned a peer review of the draft risk assessment. The peer review concluded in September 2008. EPA is currently reviewing comments on the August 2007 NODA and the peer review comments to inform follow-up actions to the May 2000 Regulatory Determination.

Beneficial Use of Coal Ash

Through the Coal Combustion Products Partnerships (C2P2) program, EPA works in cooperation with the American Coal Ash Association, the Utility Solid Waste Activities Group,

the U.S. Department of Energy, the U.S. Department of Agriculture's Research Service, the U.S. Federal Highway Administration, and the Electric Power Research Institute to promote the safe beneficial use of CCPs and the environmental benefits that result from their use. As noted previously, the Agency's May 2000 Regulatory Determination concluded that the legitimate beneficial use of CCPs did not present a risk and did not need further federal regulation, except for possibly the placement of CCPs in minefill operations. The beneficial use of CCPs saves virgin resources, reduces energy consumption, reduces GHG emissions, and reduces the need for land disposal. In one example of beneficial use, coal ash can typically replace between 15 percent and 30 percent of the Portland cement used in concrete. The inclusion of coal ash can strengthen concrete and make it more durable than concrete made with only Portland cement. This beneficial use of coal ash also reduces energy use and other environmental impacts associated with Portland cement.

For example, in 2007, by recycling 13.7 million tons of fly ash and using it in place of Portland cement, the United States saved nearly 73 trillion BTUs of energy, equivalent to the annual energy consumption of more than 676,000 households. GHG emissions were also reduced by 12.4 million metric tons of carbon dioxide equivalent, equivalent to the annual GHG emissions of 2.3 million cars.

Conclusion

EPA will continue its oversight and technical assistance efforts associated with the Kingston coal ash release to help ensure protection of human health and the environment. The

Agency will continue to keep the Committee informed on progress related to the response and on its regulatory efforts related to power plant impoundments and coal combustion wastes.