

**COAL COMBUSTION PRODUCTS (CCPs):
OPPORTUNITIES FOR EXPANDED USE
IN THE MINING INDUSTRY**

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Abstract

Annually, more than 100 million tons of coal ash is produced in the USA. Approximately 30 percent of that amount is used in a variety of applications in the construction, mining and manufacturing sectors of our economy. The coal ash that is used in these ways is collectively known as coal combustion products (CCPs). This terminology is used worldwide in guidelines, specifications and related documents. The goal of increasing the use of CCPs in the USA by a factor of two or more during the next decade is technically within the grasp of CCP industry stakeholders. The challenge is defined by the formidable factors that the American Coal Ash Association (ACAA) and others have identified and continued to address over the years. This paper will address one such factor, which is the state and federal environmental framework governing the use of CCPs.

Introduction

ACAA's mission is to advance the management and use of coal combustion products (CCPs) in ways that are technically sound, commercially competitive and environmentally safe. ACAA and its members work to gain the recognition and acceptance of specifiers, designers, contractors, legislators, regulators and others for CCPs on par with competing engineering and manufactured materials. ACAA's work in support of its mission also serves the entire "CCP industry" which comprises: producers of CCPs, including coal-burning electric utilities, both within and outside the USA, and non-utility producers; marketers of CCPs; and organizations and individuals, including coal companies, allied trade groups, and others with commercial, academic, research and other interests in the management and use of CCPs.

Today, with reliable methods for assessing the quality of CCPs, marketers and

users of CCPs view coal-burning power plants as reliable sources of quality materials. CCPs, including fly ash, bottom ash, boiler slag, and flue gas desulfurization (FGD) material are: produced from the combustion of coal, the principal fuel source for today's energy needs; specified by engineers who rely on the availability of CCPs as mineral resources for today and the 21st century; marketed by companies with knowledge of CCPs as engineering and manufacturing materials; and used in numerous applications.

Federal Regulation of CCPs

The principal federal statute under which hazardous and solid wastes are regulated is the Resource Conservation and Recovery Act, 42 U.S.C. §6901-6991 (RCRA). RCRA establishes a comprehensive cradle to grave system for regulating hazardous wastes. Specifically, Subtitle C of RCRA and its implementing regulations impose requirements on the generation, transportation, storage, treatment and disposal of hazardous wastes. To trigger these requirements, a material must be a "solid waste" and the solid waste must be "hazardous."

Subtitle D of RCRA pertains to State or Regional Solid Waste Plans. Wastes that are not considered hazardous under Subtitle C fall under Subtitle D and are subject to regulation by the states as solid waste. As originally drafted, RCRA did not specifically address whether CCPs fell under Subtitle C as a hazardous waste or Subtitle D as a solid waste.

In 1980, Congress enacted the Solid Waste Disposal Act amendments to RCRA. Under the amendments, certain wastes, including CCPs, were temporarily excluded from Subtitle C regulation. This regulatory exemption is commonly referred to as the "Bevill Exemption." 42 U.S.C. §6921(b)(3)(A)(i). As a result, CCPs fell under Subtitle D and became subject to regulation under state law as solid waste.

As the Bevill Exemption was temporary, the amendments further directed that the U.S. Environmental Protection Agency (EPA) produce a report regarding CCPs and to pursue appropriate regulation. 42 U.S.C. §6982(n). In accord with this mandate, EPA issued its first report to Congress in 1988 titled Waste from the Combustion of Coal Electric Utility Power Plants (EPA/5-30-SW-88-002). This EPA report concluded that CCPs generally do not exhibit hazardous characteristics and that regulation of CCPs should remain under state Subtitle D authority.

Following litigation against EPA by the Bull Run Coalition, because EPA failed

to timely issue a regulatory determination as stated in its 1988 report to Congress, EPA entered into a consent decree with the Bull Run Coalition which included a time frame for EPA to issue a formal recommendation regarding regulation of CCPs. Pursuant to the consent decree, EPA issued a final regulatory determination, applicable to fly ash, bottom ash, boiler slag, and FGD material, that became effective September 2, 1993. 58 Federal Register 42, 466 (August 9, 1993). That rule stated that regulation of CCPs generated by coal fired electric utilities and independent power producers as hazardous waste was unwarranted and that the materials would remain exempt from regulation as a hazardous waste under RCRA.

EPA narrowly interpreted this exemption; and, according to EPA, the exemption applied only to coal fired electric utilities and independent power producers. It did not include CCPs generated at any other industrial activity. (In re: Wheland Foundry, EAB, No. 93-2, December 22, 1993). Further, fluidized bed combustion wastes, low volume wastes (boiler blowdown, coal pile runoff, cooling tower blowdown, demineralizer regenerant rinses, metal and boiler cleaning wastes), and pyrites and co-managed wastes (referred to as remaining wastes) were not covered by the rule. EPA decided that more study was needed on these remaining wastes before an exemption determination could be made.

EPA was initially scheduled to complete a study of remaining wastes by September 30, 1998 and issue a final regulatory determination regarding these wastes by April 1, 1999 pursuant to the consent decree in the Bull Run Coalition litigation. Based on this obligation, EPA's study of fluidized bed combustion wastes, low volume wastes (boiler blowdown, coal pile runoff, cooling tower blowdown, demineralizer regenerant rinses, metal and boiler cleaning wastes), and pyrites and co-managed wastes (referred to as remaining wastes) were subsequently discussed in a March 31, 1999 Report to Congress. The report indicated that fluidized bed combustion wastes, low volume wastes and remaining wastes should continue to maintain their "Bevill Exemption" and that regulation under Subtitle C was not warranted.

Based on extensions of the consent decree mentioned above, EPA was to issue a final regulatory determination addressing fluidized bed combustion wastes, low volume wastes and remaining wastes by April 10, 2000. In early March, EPA circulated a draft regulatory determination that indicated that, contrary to the 1999 Report to Congress, these wastes would be regulated under Subtitle C. EPA's stated basis for this shift in position was that remaining wastes did present environmental concerns, particularly concerns regarding groundwater leaching and

the effects on drinking water standards, as well as effects associated with mercury exposure. ACAA, as well as other stakeholder groups, did not agree that regulation of CCPs as hazardous was warranted and met with EPA to discuss their concerns associated with the draft approach.

After much debate and discussion between EPA, industry and environmental groups (as well as an extension of the consent decree), on April 25, 2000 EPA issued its final regulatory determination, which was published in the Federal Register on May 22, 2000 (65 Federal Register 32213).

The final regulatory determination states that fluidized bed combustion wastes, co-managed wastes, as well as coal combustion wastes from non-utilities, petroleum coke combustion wastes, wastes from the combustion of mixtures of coal and other fuels (i.e., co-burning of coal with other fuels where coal is at least 50% of the total fuel), wastes from the combustion of oil and wastes from the combustion of natural gas will not be regulated under Subtitle C and would continue to maintain their "Bevill Exemption."

However, in determining if low volume wastes are subject to Subtitle C regulation, EPA divided the low volume wastes into two new categories; uniquely associated wastes and non-uniquely associated wastes. EPA defined uniquely associated wastes to include coal pile runoff, coal mill rejects and waste coal, air heater and precipitator washes, floor and yard drains and sumps, wastewater treatment sludges and boiler fireside chemical cleaning wastes. EPA took the position that when uniquely associated wastes are co-managed, those wastes would continue to be exempt from regulation under Subtitle C. However, if these wastes are managed independently and if they are listed wastes or exhibit hazardous waste characteristics, they are subject to Subtitle C regulation.

EPA defined non-uniquely associated wastes as boiler blowdown, cooling tower blowdown and sludges, intake or makeup water treatment and regeneration wastes, boiler waterside cleaning wastes, laboratory wastes, general construction and demolition debris, and general maintenance wastes. Under EPA's final regulatory determination, if a waste is a non-uniquely associated and is a hazardous waste, co-management with a Bevill waste will result in loss of the Bevill exemption. The non-uniquely associated wastes would be subject to the RCRA characteristic standards and hazardous waste listings to determine if the waste is a hazardous waste. However, as a general matter, the wastes identified as non-uniquely associated do not tend to be hazardous.

The final regulatory determination also indicated that EPA would be looking to the states to ensure proper regulation for certain CCP applications. In particular, EPA expressed the view that the States should regulate CCPs disposed in landfills or surface impoundments, or used to fill surface or underground mines. Alternatively, EPA stated that it would develop national regulations of these applications under Subtitle D of RCRA. EPA indicated in the regulatory determination that in developing/reviewing regulations it would look at the extent to which CCPs caused actual or potential damage to human health and/or the environment, the environmental effects of filling mines with CCPs, the adequacy of existing regulations, and any potential future impacts which may result from the mercury content in coal ash. EPA further indicated any national regulations would be developed through notice and comment rulemaking and in consultation with states and other stakeholders.

EPA has not formally announced any proposed rulemaking for the Subtitle D regulations; however, the history of this process suggests that the rulemaking will be accompanied by much debate on both sides of the issue. For instance, on August 21, 2000, a coalition of environmental groups filed a “petition for review” challenging EPA's determination that fluidized bed combustion wastes, certain low volume wastes when co-managed and remaining wastes are not considered hazardous waste. *Citizens Coal Council v. EPA*, D.C. Cir. No. 00-1379. ACAA and others filed motions to intervene in the lawsuit and were granted intervenor status by the court. Upon consideration of EPA's motion to dismiss, the response thereto, and the reply; and the intervenors' motion to dismiss, the response thereto, and the reply, on January 19, 2001, the court ordered that the motions to dismiss be granted.

Federal Guidance for Use of CCPs

The federal government has promoted CCP reuse through a variety of initiatives. In 1983, EPA promulgated the first federal procurement guideline that required agencies using federal funds to implement a preference program favoring the purchase of cement and concrete containing fly ash. 48 Federal Register 4229 (January 28, 1983), codified at 40 C.F.R. Part 249. The EPA endorses the use of pozzolans, such as coal ash, as the preferred method for stabilizing certain metal bearing wastes. 52 Federal Register 29992.

EPA has also published a summary of information pertaining to CCP use in an "environmental fact sheet," Guideline for Purchasing Cement and Concrete

Containing Fly Ash [EPA/530-SW-91-086, January 1992].

In addition, Executive Order 12873, Federal Acquisition, Recycling and Waste Prevention, signed by President Clinton on October 20, 1993, directs federal agencies to develop affirmative procurement programs for environmentally preferable products and requires EPA to issue guidance on principles agencies should use in making determinations for the preference and purchase of environmentally preferable products. As part of this initiative, EPA proposed a Comprehensive Procurement Guideline ("CPG") designating items that can be made with recovered materials, including fly ash from the combustion of coal. 59 Federal Register 18852 (April 24, 1994). This CPG clarified the earlier 1983 CPG indicating that fly ash from the combustion of coal can be used as a recovered material. On January 19, 2000, EPA issued a final CPG indicating that flowable fill from the combustion of coal can be used as a recovered material. 65 Federal Register 3070. This CPG became effective January 19, 2001.

Utilization efforts have included federal agency initiatives. The first large volume use of coal fly ash was by the U. S. Army Corps of Engineers ("Army Corps") in construction of the Hungry Horse Dam in 1949. The Army Corps has since built several dams utilizing coal ash and continues to perform research on utilization of coal ash. Many Army Corps specifications for military and civil construction projects provide for fly ash use in concrete. (U.S. Army Corps of Engineers, Technical Letter 1110-1-127, 17 August 1984.) The Army Corps also allows fly ash use in subgrade stabilization, embankments, flowable fill, soil amendment, and asphalt filler.

Federal Aviation Administration standards expressly allow fly ash use in certain concrete products. (Standards for Specifying Construction of Supports, AC 150/5370-10A, February 17, 1989.) The U. S. Department of Agriculture is conducting research on the use of coal ash as a soil amendment. The U. S. Bureau of mines has expressed interest in utilization of coal ash in mine reclamation. State and federal departments of transportation have generally actively supported the utilization of CCPs.

According to a 1992 Office of Federal Procurement Policy report, however, federal agency compliance with guidelines on CCP use has been minimal. (Office of Federal Procurement Policy, Report to Congress, Dec. 1992.)

Production and Use of CCPs

ACAA conducts an annual survey of the production and use of CCPs to maintain and enlarge a unique database from which an annual report is issued. The participants in ACAA's annual survey are coal-burning electric utilities from throughout the USA. ACAA's series of annual surveys and reports since the late 1960s have been used extensively by producers and marketers of CCPs, federal- and state-level government agencies, engineers and contractors, allied industry groups and others who have an interest in CCP management and use.

A comprehensive report, Coal Combustion Byproduct ("CCB") Production and Use: 1966 - 1994 [Report for Coal-Burning Electric Utilities in the United States], was published by ACAA in 1995. According to the results of the most recent survey, conducted by ACAA for calendar-year 1999, some thirty-one percent of the more than one hundred seven million tons of CCPs produced in the USA was used.

Barriers to the Use of CCPs

The U. S. DOE report to Congress, Barriers to the Increased Utilization of Coal Combustion/Desulfurization Byproducts by Governmental and Commercial Sectors [DOE Office of Fossil Energy, July 1994], resulted from Section 1334 of the Energy Policy Act of 1992 [Public Law No. 102-486] in which DOE was charged with the task of conducting a detailed and comprehensive study on the "institutional, legal and regulatory barriers to increased utilization of CCPs."

The DOE "barriers report" addresses a network of related barriers which can be overcome only through cooperative efforts among federal and state governments and industry. The DOE report provides positive guidance for improving the management and use of CCPs. Recommendations from the DOE report have previously been incorporated into ACAA's long-range guidance document, Strategic Plan: 1995 - 2000.

Review of State Regulations

As stated, state law determines CCP reuse options. ACAA has sought to track the various state laws based on their principal role governing CCP reuse. During 1998, ACAA updated a 1996 review of state solid waste laws, regulations, policies and EPA guidance governing the reuse of CCPs. Based on regulatory changes occurring after 1998, ACAA determined this report should be updated again in 2000 to reflect the changes that have taken place. In particular, regulatory changes

and/or updated information are noted in Alaska, Connecticut, Delaware, Florida, Indiana, Maine, Minnesota, New Jersey, Oklahoma, South Carolina and Texas.

Use of this Report

The information in this report provides an overview of state solid waste laws, regulations, policies and EPA guidance governing reuse of CCPs. This report will be useful to those familiar with "beneficial use" regulations for CCPs in their particular state and will assist in the exchange of regulatory guidance to enhance the use of CCPs. This report is not intended to identify landfill or similar disposal requirements.

Limitations of this Report

The information presented in this report was obtained from numerous sources through August 2000. Although the report seeks to accurately describe authorized CCP reuses in the states, the reader is cautioned to seek appropriate technical, environmental and legal advice with respect to any actions that may be undertaken concerning the management and use of CCPs in any state. This report does not constitute legal or technical advice, nor is it intended to advise the reader regarding legal or regulatory requirements applicable to CCP reuse projects in any state and it should not be relied upon for this purpose.

The Report and Related Sources of Information

The full report, State and Federal Environmental Framework Governing the Use of Coal Combustion Products (CCPs) [ACAA, September 2000, 57 pages, plus Appendix], can be obtained from ACAA. Related information, and a state-by-state summary of CCP regulations, can be found on the web site of DOE's National Energy Technology Laboratory (NETL): < <http://www.netl.doe.gov/> >. After entering the NETL site, select the "search" function and enter the words "state regulations."

Opportunities for Expanded Use of CCPs in the Mining Industry

The opportunities for expanded use of CCPs in mining industry will continue to grow at the state level, with national guidelines to be developed at the federal level. As stated in the Bevill regulatory determination, EPA will be looking to the states to ensure proper regulation for such CCP applications. Each stakeholder in the CCP industry can become an active participant in ensuring that mining applications of

CCPs are developed to the fullest in ways that are supportive of ACAA's mission, which is to advance the use of CCPs in ways that are technically sound, commercially competitive and environmentally safe.