

2016
COAL
COMBUSTION
RESIDUALS



INTRODUCTION

This is the seventh edition of the Southern Company Coal Combustion Residuals Report, which has been published and updated annually since 2010.

Coal combustion residuals (CCRs) include fly ash, bottom ash, boiler slag and flue gas desulfurization, or scrubber, materials such as synthetic gypsum, which are produced when coal is burned for electricity generation. Power plants referred to in this report as the “Southern Company system” are owned and/or operated by subsidiaries Alabama Power, Georgia Power, Gulf Power and Mississippi Power.

As part of our commitment to providing a balance of clean, safe, reliable and affordable energy for the customers we serve, the Southern Company system operates a rigorous program with the goal to safely and effectively manage coal ash resulting from power generation. A robust system is in place to comply with all regulations governing CCR management and ensure safe operation of company facilities. In addition, a significant amount of CCRs from the system's coal-based power generation plants is recycled for beneficial uses such as concrete production and road building.

LEADERSHIP

Southern Company's commitment to the environment, including responsible management of CCRs resulting from power generation, starts with top executives and extends throughout the company.

Southern Company's chief environmental officer, who is also the senior vice president of research and environmental affairs, is responsible for the Southern Company system's overall environmental programs. The chief environmental officer reports to Southern Company's chief operating officer (COO), who reports

to the chairman, president and chief executive officer (CEO) of Southern Company.

Overall leadership is provided by the Southern Company management council, a team of senior officers responsible for establishing corporate policies, reviewing key strategies and evaluating the company's performance. The management council is composed of Southern Company's CEO, COO, chief financial officer, president of external affairs, general counsel and the CEOs of each operating company and Southern Company Services. Also, the Southern Company board of directors reviews the company's environmental policy activities.

The environmental management council (EMC) is led by the chief environmental officer and consists of officers and senior management from Alabama Power, Georgia Power, Gulf Power, Mississippi Power, Southern Nuclear, Southern Power and Southern Company Services.

The primary functions of the EMC are to provide leadership and direction for environmental matters throughout the company. Specifically, the EMC ensures key objectives, policies, processes, programs and resources are in place to support an effective environmental management system and ensure all employees and business units understand and meet the requirements of the company's environmental policies, standards and goals.

A central tenet is that all operations assure compliance with local, state and federal regulatory and compliance obligations. Water, air and land governance teams provide support so that all elements of the environmental management system work effectively throughout the Southern Company system. In matters related to CCRs, the system's land governance team works closely to support development of strategies for compliance with existing and new environmental requirements for CCRs.



An ash pond in Alabama

A COMMITMENT TO SAFE AND SECURE MANAGEMENT OF CCRs

The Southern Company system, which serves more than 4.5 million customers, is committed to developing real, innovative solutions to shape America's energy future through the full portfolio of energy resources. Sometimes referred to as an "all of the above" strategy, the full portfolio includes nuclear, 21st century coal, natural gas, renewables and energy efficiency.

With its abundance and proven effectiveness as a low-cost and reliable energy source, coal in 2015 was used to generate approximately 33 percent of the electricity in the U.S.

When coal is burned to make the steam that drives electricity generators, ash is the noncombustible mineral matter left behind. Ash is the most prevalent of CCRs, taking the form of fly ash (fine, smaller particles) or bottom ash (coarse, larger particles that settle at the bottom of a boiler). Depending on the coal type, the amount of ash that remains is generally about 10 percent of the coal that is burned as fuel. Emission-control technologies collect ash and prevent particles from being emitted into the atmosphere.

Another type of CCR is gypsum, a byproduct from operating an emission-control technology called a scrubber. Because gypsum is not produced directly from coal, it is quite different from coal ash; it is similar in composition to naturally mined gypsum.

Some metals such as arsenic, mercury and lead that occur naturally in coal in trace amounts remain in the ash. By using appropriate procedures, the metals are contained within ash management facilities on site at the power plants. The two most common types of ash management facilities are landfills, which are used to dispose of dry ash, and surface impoundments, also called wet ponds, in which ash settles at the pond bottom. Ash collected for beneficial reuse is in some cases stored in dry ash silos. CCR surface impoundments have been a standard practice



New CCR landfill liner system installation at a Georgia Power plant

for managing fly ash and bottom ash, and the Southern Company system has been operating sites safely and effectively for decades.

A market exists for ash to be safely recycled for concrete, road building and other beneficial uses. Power plant gypsum also has a number of beneficial uses, most commonly as ingredients in commercial wallboard and cement manufacturing. Therefore, not all of the collected CCRs remain on site.

The Southern Company system produced 2.8 million tons of ash and about 1.8 million tons of gypsum in 2015. Southern Company’s regulated operating subsidiaries currently own and/or operate 22 power plants in four states (Alabama, Florida, Georgia and Mississippi) with CCR management facilities for fly ash and bottom ash and, in some cases, gypsum.

Regardless of the management technology utilized, public safety and the security of these facilities are the highest priorities. Plants comply with applicable state regulations, and the Southern Company system has a rigorous inspection program in place to help ensure its CCRs are safely managed.

2015 Southern Company System CCR Production (tons)

Fly Ash	Bottom Ash	Gypsum
2.2 million	640,000	1.8 million

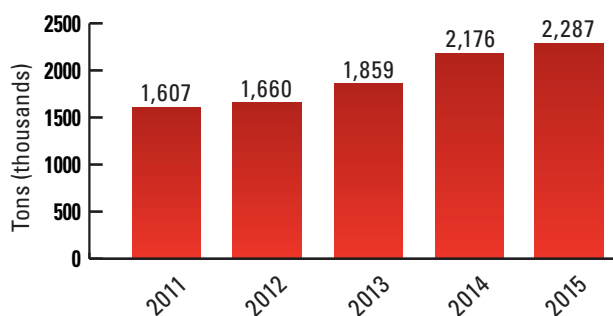
2015 Southern Company System Ash Managed (tons/percent of total)

Fly Ash	Bottom Ash
Wet - 925,926 / 42%	Wet - 460,205 / 72%
Dry - 1.29 million / 58%	Dry - 179,885 / 28%

REGULATORY COMPLIANCE

On April 17, 2015, the U.S. Environmental Protection Agency (EPA) published its final rule establishing comprehensive regulations for the disposal of CCRs from coal-fired power

Southern Company System CCR Recycling (e.g., ash, gypsum)



plants under subtitle D of the Resource Conservation and Recovery Act (RCRA), classifying CCRs as nonhazardous solid waste.

EPA issued the final rule under a self-implementing approach, because the agency lacks direct enforcement authority under RCRA subtitle D to administer the minimum federal criteria through permits. Therefore, beginning Oct. 19, 2015, EPA required the federal criteria to be administered by each owner and/or operator that manages CCRs in surface impoundments and landfills. The final rule continues to exclude the beneficial use of CCRs from regulation.

Under the final rule, the federal criteria include requirements for design and operating standards, structural stability inspections, groundwater monitoring, dike structural stability, location restrictions and closure and post-closure care for all existing and new surface impoundments and landfills. Furthermore, compliance with the federal criteria is measured through a record-keeping, notification and internet-posting requirement.

For each CCR unit subject to the final rule, the owner or operator will maintain the required compliance data in the facility’s operating record, notify the state’s environmental agency director of such information and publish the information on the company’s publicly available CCR Rule Compliance and Data Information website for five years. The table on page 4 provides a link to each operating company’s website.

CCR Rule Compliance Data and Information Websites

Alabama Power	http://www.alabamapower.com/about-us/ccr
Georgia Power	https://www.georgiapower.com/environment/ccr.cshtml
Gulf Power	http://www.gulfpower.com/about-us/background/coal-ash-rule.cshtml
Mississippi Power	http://www.mississippipower.com/about-energy/plants/coal-ash-rule

Prior to EPA's final rule, regulation of CCRs had been under the purview of the individual states, which have their own requirements. Under the new CCR rule, states retain their authority to incorporate the federal CCR requirements into their existing solid waste regulatory programs in the future, but are not required to do so. Some states may even require a change in state legislation allowing an update of applicable state regulations.

Southern Company supports implementation of the final rule through state solid waste management plans and will continue to work closely with its respective state environmental agencies to ensure continued compliance.

Southern Company continues to believe EPA should provide sufficient time and flexibility for the implementation of changes in CCR handling, management and disposal practices and surface impoundment closure options for compliance with new regulatory requirements.

RECENT ANNOUNCEMENTS

On March 29, 2016, Georgia Power announced that preparation activities are underway to permanently close all of its 29 ash ponds located at 11 coal-fired generation facilities across the state. Twelve ponds are scheduled for closure in less than two years; 16 are expected to close in less than 10 years; and one pond is expected to close in approximately 10 to 14 years. The decision to close the ponds

is in response to EPA's CCR rule as well as the final Steam Electric Power Effluent Limitation Guidelines (ELG).

The company is coordinating with the Georgia Environmental Protection Division (EPD) on the closure plan and will continue to work closely with EPD during the closure process. In addition, all ash pond closures will be certified by a professional engineer. The company's primary focus throughout the closure process is maintaining a reliable generation fleet, while conducting the closure process in the most efficient way possible.

Similarly, Alabama Power expects the regulation of CCR disposal in combination with the new ELG regulation will ultimately lead to the closure of its coal ash ponds.

Gulf Power uses dry ash management for the active coal generation it operates and is working with the Florida Department of Environmental Protection (FDEP) on closure plans for the ash ponds associated with recently retired generating plants. Gulf Power will continue to work closely with FDEP throughout the closure process.

Mississippi Power's Plant Watson units 4 and 5 began exclusive natural gas operation in March 2015. This change in fuel means the ash pond and landfill will no longer be receiving new coal ash. For this reason, the company has requested approval from the Mississippi Public Service Commission to close the ash pond at Plant Watson. The company is currently evaluating options at Plant Daniel.

ENSURING DAM INTEGRITY

A key to safe and secure CCR management is ensuring the integrity of the containment system. The Southern Company system's dam safety program is comprehensive and includes inspections, reporting, analysis, regulatory compliance, emergency response preparedness, routine maintenance and vegetation-control standards.

Inspections of dams and dikes are critical components that are conducted on a regular basis – at least weekly by trained plant personnel and annually by professional dam



Southern Company system employees inspect a dam, part of the regimen to ensure safety.

safety engineers. Additional inspections are performed after unusual events such as heavy storms. The inspections by dam safety professionals are in-depth and supplemented with engineering analyses, which together help ensure the integrity of the ash pond or impoundment is maintained and that action is taken, as needed, based on the findings.

Safety inspections include numerous checklist items. Specific items vary from site to site but may include observations of such things as pond levels, weather conditions, rainfall since the prior inspection, instrument readings, conditions of slopes and drains, erosion, animal damage, ant hills, alignment of retaining structures and more. Dam safety engineers assess instrument readings, inspect any maintenance or remediation performed since the previous inspection, check the status of work recommended at prior inspections, ensure the posting of emergency notification information is up to date and evaluate any items noted during plant personnel inspections.

In summary, major steps taken at Southern Company system plants to ensure dam safety include:

- **Emergency Response** – Each plant has a dedicated dam safety referral phone number to notify appropriate company personnel rapidly in the event of an emergency. Emergency equipment and materials are available at each plant to provide immediate repair work.

- **Training** – Plant personnel who conduct inspections are trained by dam safety experts annually.
- **Vegetation Control** – Vegetation must be maintained and managed properly to facilitate adequate inspections. Dikes are kept free of trees and woody brush unless specific exceptions are made for beneficial vegetation or other situations as determined by a dam safety engineer.
- **Instrumentation** – Dam safety instrumentation is installed at sites as needed and can provide early warning for potential problems. Water level and other readings are taken on a specific schedule by trained personnel. Any abnormal readings are evaluated immediately.
- **Structural Modifications** – Any proposed new structure, modification to an existing structure or change in the water level must be reviewed and approved by professional engineers prior to and during design and construction.

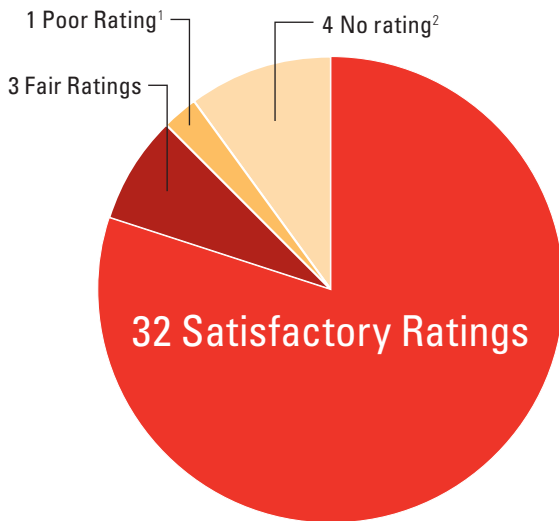
Although the Southern Company system's CCR management practices have proven to be effective for decades, they are regularly evaluated and refined as needed. In addition, following the incident at the Tennessee Valley Authority Kingston plant in 2008, the system's impoundments were reviewed by professional civil engineers from the company with expertise in dam and dike construction. And under direction from Southern Company's chief production officer, the system investigated its structures and reviewed its management practices and procedures. That process confirmed that all Southern Company system CCR impoundments were structurally sound and subject to procedures to ensure continued safe and effective operation.

EPA INSPECTIONS

In recent years, EPA has undertaken an extensive process to collect information and conduct on-site inspections of electric utility coal ash surface impoundments across the country. This effort included 40 wet CCR disposal facilities across the Southern Company system. EPA posted on its website the results of these inspections, including ratings – from

satisfactory, the highest possible, to unsatisfactory, the lowest – and any recommended actions needed. As seen in the chart below, the vast majority of Southern Company system facilities received the highest rating.

Southern Company System CCR Impoundment Inspections



TURNING CCRs INTO USEFUL PRODUCTS

There are many beneficial uses for coal ash, including concrete – to build sidewalks, roads, bridges and buildings – and manufacturing. Synthetic gypsum is reused in wallboard, agriculture and other applications. The beneficial reuse of coal ash conserves natural resources, reduces the amount of CCRs that must be managed at power plants and landfills and reduces utility rates for customers.

A strong market for recycled coal ash and power plant gypsum has developed over many years, and Southern Company, both independently and in partnerships, is involved in research to improve and expand beneficial reuse. Although the amount varies from year to year because of economic conditions and other factors, about 40 to 50 percent of the Southern Company system’s CCRs on average are sold for reuse.

In all cases, applications represent instances in which the CCR material provides equal or greater technical performance, value and safety compared with other natural and byproduct materials. The Southern Company system works to ensure the safe use of CCRs by targeting applications that have a proven safety record, and purchasers are bound by contract to use these products only for intended purposes.

In 2013, EPA released a risk evaluation methodology to evaluate various encapsulated uses for CCRs. EPA’s study concludes the uses of coal fly ash in concrete and synthetic gypsum in wallboard are safe and appropriate beneficial uses. EPA promotes these beneficial uses for sustainable materials management. The agency has future plans to develop similar methodology for evaluating risks from unencapsulated beneficial uses of CCRs, which include coal ash and synthetic gypsum.

CEMENT AND CONCRETE

The largest user of fly ash is the concrete industry. Concrete is the most widely used manmade building material in the world, used in sidewalks, roads, bridges, parking structures and building structures such as foundations, floors and walls. Concrete is a mix of gravel, sand, cement and water. Cement is the “glue” that binds the material together to form a hardened product. It is also the most expensive component in concrete as it is a manufactured product made by mining several raw materials burned in an energy-intensive process.

In cement manufacturing, fly ash is used to replace typical raw feed materials such as limestone, sand, clay and iron. Because fly ash is largely silica, alumina and iron (plus calcium in some cases), it can replace a portion of these raw materials, resulting in less mining of natural resources and avoiding the associated carbon footprint of mining equipment and quarrying activities.

According to EPA, one ton of fly ash used as replacement for cement conserves enough landfill space to hold approximately 1,200 pounds of waste (the same amount of solid waste produced by one American over 270 days), reduces the equivalent of two months of an automobile’s

¹ Poor rating at Georgia Power Plant Hammond Ash Pond 4 is conditional. EPA recommendations have been completed by Georgia Power, and the unit is considered satisfactory. ² No rating given due to “less-than-low” hazard potential or falls outside scope of assessment because EPA determined pond to not be a CCR surface impoundment.

carbon dioxide emissions and saves enough energy to provide electricity to an average American home for 19 days. (Source: Using Coal Ash in Highway Construction: A Guide to Benefits and Impacts, EPA-530-K-05-002, April 2005.)

Not only can fly ash be used in manufacturing cement, but it is commonly used to replace 15 to 20 percent of the cement in concrete and can be as much as 40 percent for some ashes.

Technical benefits include increased strength, workability and durability as well as lower cost. Gypsum constitutes approximately 5 percent of the weight of cement and helps keep the concrete from hardening too quickly. It is a standard component of cement manufacturing, and power plant gypsum is a well-established and cost-effective substitute for mined gypsum.

CONCRETE BLOCKS

Bottom ash is primarily used as a lightweight aggregate to replace expanded natural aggregates such as clay and shale. The use of bottom ash to replace these mined aggregates saves natural resources and provides another opportunity to reduce carbon dioxide emissions related to mining. This use also provides some of the same technical benefits seen in the use of fly ash for concrete.



Cement manufacturing is another key market for recycled CCRs.

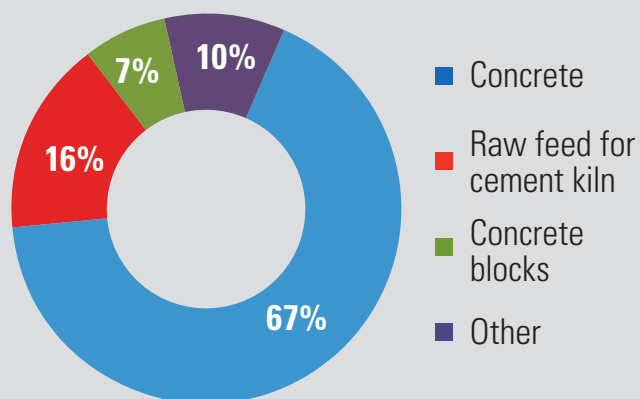
WALLBOARD

Gypsum represents more than 95 percent of the solids weight in wallboard. Use of synthetic gypsum to replace mined gypsum is an established technology, with scrubber gypsum having advantages such as comparable purity and finer particle size. Other environmental and economic benefits include reduced carbon dioxide emissions compared with mining natural gypsum and lower raw material and shipping costs.

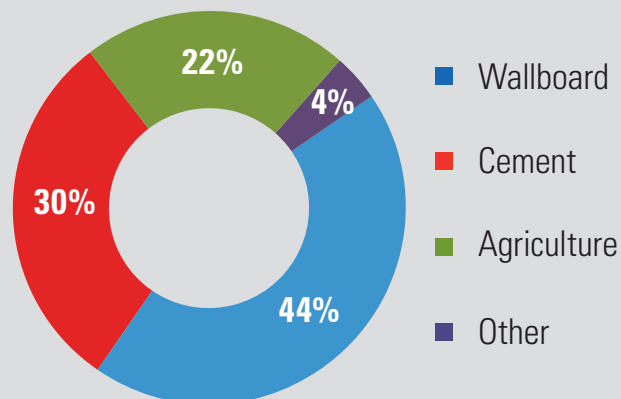
AGRICULTURE

Synthetic gypsum from scrubbers has a variety of acceptable uses as a soil additive for agricultural

Ash Sold in 2015 by the Southern Company System for Beneficial Reuse



Gypsum Sold in 2015 by the Southern Company System for Beneficial Reuse





The use of gypsum in agriculture is one of the areas of CCR research.

applications. For example, it has been demonstrated to safely promote the growth of certain plants such as turf grass, peanuts, cotton and a variety of vegetables. Among the proven benefits of synthetic gypsum are drought tolerance, increased water infiltration into soil, a source of calcium and sulfur for certain crops, increased root depth and mass and reduced soil erosion. The Southeast in particular has abundant soils, crops and businesses that can benefit from its use.

CONCLUSION

Safe management of CCRs is part of Southern Company's commitment to environmental responsibility. For decades, the Southern Company system has provided customers with clean, safe, reliable and affordable energy while safely maintaining surface impoundments that store CCRs at our coal-fired power plants. The system has a comprehensive, routine inspection program to help maintain the integrity of its CCR containment structures. The system is committed to continuous improvement through beneficial uses of CCRs and assessment programs for evaluating the safety and stability of the system's surface impoundments, and we enhance programs as necessary to maintain a high level of care.

We welcome your comments, questions and suggestions. Please send feedback about this report to CCRreport@southernco.com.



Wallboard manufacturing continues to be the largest market for recycled gypsum.

Cautionary Note Regarding Forward-Looking Statements

Certain information contained in this report is forward-looking information based on current expectations and plans that involve risks and uncertainties. Forward-looking information includes, among other things, statements concerning current and proposed environmental regulations and related compliance plans. Southern Company cautions that there are certain factors that can cause actual results to differ materially from the forward-looking information that has been provided. The reader is cautioned not to put undue reliance on this forward-looking information, which is not a guarantee of future performance and is subject to a number of uncertainties and other factors, many of which are outside the control of Southern Company; accordingly, there can be no assurance that such suggested results will be realized. The following factors, in addition to those discussed in Southern Company's Annual Report on Form 10-K for the fiscal year ended Dec. 31, 2015, and subsequent securities filings, could cause actual results to differ materially from management expectations as suggested by such forward-looking information: the impact of recent and future federal and state regulatory changes, including environmental laws regulating emissions, discharges and disposal to air, water and land, and also changes in tax and other laws and regulations to which Southern Company and its subsidiaries are subject, as well as changes in application of existing laws and regulations; current and future litigation, regulatory investigations, proceedings or inquiries; the ability to control costs and avoid cost overruns during the development and construction of facilities; the ability to construct facilities in accordance with the requirements of permits and licenses and to satisfy any environmental performance standards; advances in technology; state and federal rate regulations and the impact of pending and future rate cases and negotiations; catastrophic events such as fires, earthquakes, explosions, floods, hurricanes and other storms, droughts, pandemic health events such as influenzas, or other similar occurrences; and the effect of accounting pronouncements issued periodically by standard-setting bodies. Southern Company expressly disclaims any obligation to update any forward-looking information.

