Coal Combustion Residuals
Proposed Regulation

ASTSWMO Hazardous Waste Training Conference
June 29, 2010
Contents

- Overview
- Background
- Revisiting the May 2000 Regulatory Determination
- Elements of the Subtitle C Proposal
- Elements of the Subtitle D Proposal
- Comparison of the Subtitle C and Subtitle D Proposals
- Other Alternatives Considered
- Beneficial Use
Overview

- Coal Combustion Residuals (CCRs) are byproducts from the combustion of coal – fly ash, bottom ash, boiler slag, and flue gas desulfurization materials.

- CCRs contain contaminants such as mercury, cadmium, and arsenic. If not properly managed, can pose a threat to public health and the environment, primarily through leaching into groundwater.

- Proposal covers CCRs generated from the combustion of coal at electric utilities and independent power producers.

- EPA is proposing 2 approaches for regulating disposal of CCRs under the Resource Conservation and Recovery Act (RCRA)—one under Subtitle C and one under Subtitle D.
Overview (continued)

- Engineering requirements, such as liners, gw monitoring, and structural stability, of each option are virtually identical; differences are primarily in enforcement and implementation.

- Bevill exemption remains in place for beneficial uses of CCRs.

- Minefilling is not covered by the proposal.

- The proposal was published in the Federal Register on June 21 (75 FR 35128.) The comment period is 90 days (ends September 20, 2010). There will be public hearings on the rule - one in the Washington, DC area and several in other US cities.
Overview (continued)

- Principles for EPA decisions:
  - Protective of Public Health and Environment
  - Sound Science
  - Transparency and Greatest Degree of Public Participation
Revisiting the May 2000 Regulatory Determination

- EPA is revisiting its May 2000 regulatory determination for CCRs being disposed.

- In May 2000, EPA determined that:
  
  - Disposal of CCRs could pose significant risks if not properly managed, even though risk data were limited.
  
  - Significant improvements were being made in waste management practices due to increasing state oversight, although gaps remained in the current regulatory regime.
Revisiting the May 2000 Regulatory Determination (continued)

- The Bevill exemption should be retained.

- EPA would issue a regulation under Subtitle D of RCRA, establishing minimum national standards.

- EPA would continue to review information on CCRs.

- EPA has conducted considerable data gathering and analysis since the determination.

- There are differing views on the meaning of EPA’s information and the course EPA should take. This is driven in part by:
  - Complexity of the data and the analyses
  - Implications of the various options
Revisiting the May 2000 Regulatory Determination (continued)

- EPA will evaluate the 8 factors in RCRA Section 8002(n):

1. Source and volumes of CCRs generated per year
   - 136 million tons generated in 2008

2. Present disposal and utilization practices
   - 34% (46 million tons) landfilled
   - 22% (29.4 million tons) disposed of in surface impoundments
   - nearly 37% (50.1 million tons) beneficially used
   - nearly 8% (10.5 million tons) placed in mines

   Approximately 300 CCR landfills and 584 surface impoundments in use at approximately 495 coal-fired power plants

   Age of units varies - 75% of impoundments are greater than 25 years old; 10% greater than 50 years old.
Revisiting the May 2000 Regulatory Determination (continued)

- Significant increase in use of CCRs – commercial sectors depend on use of CCRs, used as ingredients in specific products; new applications.

3. Potential Danger, if any, to human health and the environment from disposal and use of CCRs.

- Contaminants include: antimony, arsenic, barium, beryllium, cadmium, chromium, lead, mercury, nickel, selenium, silver, and thallium.

- Exposure pathways are ground water ingestion, inhalation, and fish consumption.

- Ecological effects include contamination of surface waters and wetlands and exposure of aquatic life to contaminants of concern.
Revisiting the May 2000 Regulatory Determination (continued)

- Risks modeled often exceed EPA’s regulatory level of concern.

- Potential exists for chemical characteristics of CCRs to increase due to use or application of advanced air pollution control technologies.

- Of the 584 surface impoundments, a certain percent have a potential for loss of life and/or environmental damage in the event of failure
  - 109 have a high or significant hazard potential rating
  - Units are aging (56 older than 50 years; 96 over older than 40 years; and 340 between 26 and 40 years old.)

- No evidence of damages from beneficial uses identified in original determination; wide acceptance of encapsulated uses.
4. Documented cases in which danger to human health or the environment from surface runoff or leachate has been proved.
   - EPA Damage Case Analysis
   - Information submitted by other groups

5. Alternatives to current disposal methods.

6. Cost of such alternatives.

7. Impact of the alternatives on the use of coal and other natural resources.

Revisiting the May 2000 Regulatory Determination (continued)

- EPA seeks comments specifically on 3 areas of analyses:
  - Extent of existing damage cases
  - Extent of risks posed by mismanagement of CCRs
  - Adequacy of state programs to ensure proper management of CCRs
    - Key issue - under either alternative, States have key implementation roles
Major Elements of the Subtitle C Proposal

- CCRs will be listed as a “special waste subject to subtitle C” – S001.

- CCRs and the facilities that manage them will be subject to the existing Subtitle C requirements, e.g., generator, transporter, permitting, ground water monitoring, corrective action, and financial assurance.

- LDRs and treatment standards apply.

- Modifying certain requirements, using Section 3004(x)
  - Single composite liner.
  - 5 years for surface impoundments to comply with requirements; no requirement for annual dredging.
Structural Stability Requirements

Existing landfills must install groundwater monitoring within 1 year of effective date of rule, but do not need to install composite liners.

New landfills or lateral expansions of existing landfills must install composite liners, groundwater monitoring system, as well as meet the other technical requirements before they can accept CCRs.

Surface impoundments must meet LDRs and liner requirements within 5 years of effective date of rule or close within an additional 2 years.
Major Elements of Subtitle D Proposal

- CCRs remain classified as a “non-hazardous” waste.

- National minimum criteria governing facilities disposing of CCRs.

- Standard is “no reasonable probability of adverse effects on health or the environment” from disposal of solid waste at the facility.

- Many of the engineering requirements are virtually identical to the Subtitle C option, e.g., gw monitoring, liner and structural stability requirements.

- Requirements are self implementing.
Major Elements of Subtitle D Proposal (continued)

- Owner/operator required to obtain certifications by independent professional engineers/minimum qualification requirements for those who make certifications.

- Owner/operator required to document how various standards are met. Must be kept in the operating record and the State notified.

- Owner/operator required to maintain a web site available to the public that contains the documentation that the standard is met.
### Key Differences Between Subtitle C and Subtitle D Options

<table>
<thead>
<tr>
<th></th>
<th>Subtitle C</th>
<th>Subtitle D</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Effective Date</strong></td>
<td>Timing varies; states must adopt rule</td>
<td>Six months after promulgation; some provisions longer</td>
</tr>
<tr>
<td><strong>Enforcement</strong></td>
<td>State and federal enforcement</td>
<td>Enforcement through citizen suits; states can act as citizens</td>
</tr>
<tr>
<td><strong>Permit Issuance</strong></td>
<td>Federal requirements for State permits</td>
<td>Not required</td>
</tr>
<tr>
<td><strong>Financial Assurance</strong></td>
<td>Yes</td>
<td>Considering subsequent rule using CERCLA 108(b) authority</td>
</tr>
</tbody>
</table>
## Key Differences Between Subtitle C and Subtitle D Options

<table>
<thead>
<tr>
<th></th>
<th>Subtitle C</th>
<th>Subtitle D</th>
</tr>
</thead>
<tbody>
<tr>
<td>Storage requirements,</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>including containers,</td>
<td></td>
<td></td>
</tr>
<tr>
<td>tanks, containment</td>
<td></td>
<td></td>
</tr>
<tr>
<td>buildings; generator and</td>
<td></td>
<td></td>
</tr>
<tr>
<td>transportation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>requirements</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Structural Stability</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Landfills built before</td>
<td>GW monitoring - install 1 year from effective</td>
<td>GW monitoring - install 1 year from effective</td>
</tr>
<tr>
<td>effective date of rule</td>
<td>date; no liner required</td>
<td>date; no liner required</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## Key Differences between Subtitle C and Subtitle D Options (continued)

<table>
<thead>
<tr>
<th></th>
<th>Subtitle C</th>
<th>Subtitle D</th>
</tr>
</thead>
<tbody>
<tr>
<td>Landfills built after</td>
<td>Single composite liner &amp; GW monitoring</td>
<td>Single composite liner &amp; GW monitoring</td>
</tr>
<tr>
<td>effective date of rule</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SI's built before</td>
<td>Remove solids and meet LDRs; retrofit with liner within 5 years; effectively</td>
<td>Remove solids and retrofit SI with composite liner or cease receiving</td>
</tr>
<tr>
<td>effective date of rule</td>
<td>phases out use of existing SI's</td>
<td>waste within 5 years of effective date and close unit</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## Key Differences between Subtitle C and Subtitle D Options (continued)

<table>
<thead>
<tr>
<th></th>
<th>Subtitle C</th>
<th>Subtitle D</th>
</tr>
</thead>
<tbody>
<tr>
<td>SI's built after effective date of rule</td>
<td>Meet LDRs and liner requirements; effectively phases out use of new SI's</td>
<td>Composite liners</td>
</tr>
<tr>
<td>Closure and Post-Closure Care</td>
<td>Yes, monitored by States and EPA</td>
<td>Yes, self-implementing</td>
</tr>
<tr>
<td>Siting requirements</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>

20
Additional Options Considered

- D Prime -- Surface impoundments allowed to operate, even if unlined, until end of useful life; other requirements same as the D proposal.

- Wet-handled CCRs regulated under Subtitle C; Dry-handled under Subtitle D.

- Issue Subtitle C regulations, but they would not go into effect for a certain time. CCRs would be excluded from Subtitle C regulations if States developed enforceable Subtitle D regulations; submitted them to EPA for review within 2 years of promulgation of EPA’s rules; and EPA had approved within 1 year. If a state failed to develop a program within 2 years or EPA did not approve within the 1 year time, the federal listing would become effective.
“CKD Approach”
- Establish detailed management standards under Subtitle D.
- If CCR management was in egregious violation of the requirements, the CCRs would be considered “special wastes” under Subtitle C.

- Rely on NPDES Permits for structural integrity requirements
Beneficial Use

- EPA supports and encourages safe and environmentally appropriate beneficial uses.

- Beneficial use has significant benefits – conserves resources, provides improved material properties, reduces GHG emissions, lessens need for disposal units, and provides significant domestic economic benefits.

- EPA recognizes, however, important issues and uncertainties associated with specific uses, considerable recent and ongoing research, and that the composition of CCRs are likely changing as result of more aggressive air pollution controls.
Beneficial Use

- Background

  - EPA concluded federal regulation not warranted for the beneficial uses identified in the May 2000 Regulatory Determination because:
    
    - “(a) We have not identified any other beneficial uses that are likely to present significant risks to human health or the environment and (b) no documented cases of damage to human health or the environment have been identified.”

  - Identified uses of CCRs provide significant benefits.

  - No justification for regulating them at the Federal level.
Beneficial Use

- Background (continued)

- Since May 2000, EPA learned that:
  - Significant increase in use of CCRs and development of commercial sectors that depend on beneficial use of CCRs.
  - Beneficial use of CCRs provide significant environmental benefits, including reduction of GHG emissions.
  - New applications may provide even greater GHG benefits.
Beneficial Use

- Background (continued)

- New research indicates that standard tests, e.g., TCLP, may not represent leaching characteristics under various field conditions.

- New studies on use of CCRs have been and are being conducted: performance of CCR-derived materials in road construction, and agriculture and risks that may or may not be associated with different uses of CCRs.

- State “beneficial use” regulatory programs continue to develop.
Beneficial Use

- Observations

- Some of this new information confirms or strengthens EPA’s views on benefits of CCRs.

- On the other hand, unencapsulated uses raise concerns and merit attention. For example:
  - Unencapsulated CCR placement on land in road embankments or agricultural uses presents issues similar to disposal.

- Amounts and manner of CCR use – such as when subject to engineering specifications and material requirements – very different from landfilling.
Beneficial Use

- What is **not** Beneficial Use

  - EPA recognizes seven proven damage cases involving the large-scale placement of CCRs – akin to disposal.
    - Involved filling of old quarries and gravel pits, or landscaping with large quantities of CCRs.
    - EPA did not consider this use to be “beneficial” in our May 2000 Regulatory Determination.
    - In the proposed Preamble, explicitly removing large scale fill operations from being considered beneficial use – consider them subject to disposal management standards.
Beneficial Use

- General Conclusions

  - Proposal would leave in place the May 2000 Regulatory Determination that beneficially used CCRs do not warrant federal regulation.

  - Not able to identify damage cases in 2000 nor reason to believe true beneficial uses present significant risk to hh&e.

  - Some disagree with our findings but have provided no data that supports their position.

  - Additionally, no information provided that shows risk for agricultural uses.
**Beneficial Use**

- **General Conclusions (continued)**
  - EPA is not aware of any data or other information that shows environmental issues associated with beneficial uses identified in 2000 Regulatory Determination, including:

<table>
<thead>
<tr>
<th>Waste Stabilization</th>
<th><strong>Beneficial Construction Applications:</strong></th>
<th>Agricultural Applications</th>
<th><strong>Other Applications:</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Cement</td>
<td></td>
<td>Absorbents</td>
</tr>
<tr>
<td></td>
<td>Concrete</td>
<td></td>
<td>Filter Media</td>
</tr>
<tr>
<td></td>
<td>Brick</td>
<td></td>
<td>Paints</td>
</tr>
<tr>
<td></td>
<td>Concrete Products</td>
<td></td>
<td>Plastics</td>
</tr>
<tr>
<td></td>
<td>Road Bed</td>
<td></td>
<td>Metals Mfgr</td>
</tr>
<tr>
<td></td>
<td>Structural Fill</td>
<td></td>
<td>Snow &amp; Ice Control</td>
</tr>
<tr>
<td></td>
<td>Blasting Frit</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Wall Board</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Insulation</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Roofing Materials</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Beneficial Use

General Conclusions (continued)

- Therefore, the Preamble expresses conclusion that beneficial uses identified in 2000 Regulatory Determination do not pose risks of concern.

- Thus, EPA did not propose reversal of Bevill determination.

- Some Reservations:
  
  - Due to such issues as upgraded air pollution control technologies and new leaching data, EPA considering better defining beneficial use or developing detailed guidance.
Beneficial Use (continued)

General Conclusions (continued)

- The Preamble seeks information on unencapsulated uses.

- Seeking comment on standards allowing unencapsulated uses, based on site specific risk assessments and character and composition of CCRs, leaching potential, and how CCRs would be applied (e.g., location, volume, and application rate.)

- Other alternative approaches discussed include regulation of unencapsuled uses similar to “use constituting disposal” or banning unencapsulated uses found to warrant such treatment.
Beneficial Use (continued)

Summary

- EPA continues to believe that properly performed beneficial use is environmentally preferable outcome for CCRs
  - Concerned about regulatory decisions that limit beneficial uses
  - Thus, not proposing to modify the existing Bevill exemption

- Also recognize disparity in quality of state beneficial use programs, uncertainty in the future characteristics of CCRs, and uncertainty about risks associated with some beneficial uses.

- Also understand the potential environmental benefits of CCRs as substitutes for other materials.
Requests for Information Related to Beneficial Use

State Programs

- Information and data demonstrating where federal and state programs could improve on being environmentally protective and where states have developed, or are developing, increasingly effective beneficial use programs.

- Growth and maturation of state beneficial use programs and how to account for potentially changing composition of CCRs as a result of improved air pollution control and new science on metals leaching.

- State recognition of beneficial use of CCRs as a critical component in strategies to reduce GHG emissions.

- Appropriate means of evaluating CCR uses to determine if they are both protective of human health and the environment and provide benefits.
Requests for Information Related to Beneficial Use (continued)

- Unencapsulated Uses

- Information and data on the extent to which states request and evaluate CCR characterization data prior to allowing beneficial use of unencapsulated CCRs.

- Whether unencapsulated and other uses of CCRs warrant tighter control and why such tighter controls are necessary.

- Whether it is necessary to better define beneficial use or develop detailed guidance on the beneficial use of CCRs to ensure protection of hh&e, including whether certain unencapsulated uses should be prohibited.
Requests for Information Related to Beneficial Use (continued)

- Unencapsulated Uses (continued)
  
  - If EPA determines that regulations are needed for the beneficial use of unencapsulated CCRs, should EPA consider removing the Bevill exemption for such uses and regulate these uses under RCRA subtitle C or develop regulations under RCRA subtitle D or some other statutory authority, such as the Toxic Substances Control Act?

  - Information and data relating to the agricultural use of FGD gypsum, including the submission of historical data, taking into account the impact of pH on leaching potential of metals, the variable and changing nature of CCRs, and variable site conditions.
Requests for Information Related to Beneficial Use (continued)

- Regulations

  - Whether EPA should promulgate standards allowing uses on the land based on site-specific risk assessments, taking into consideration the composition of CCRs, their leaching potential under the range of conditions under which the CCRs would be managed, and the context in which CCRs would be applied, such as location, volume, rate of application, etc.; OR

  - Whether EPA should rely on implementing states to impose CCR site-specific limits based on front-end characterization that ensures individual beneficial uses remain protective.
Requests for Information Related to Beneficial Use (continued)

- New Uses and Incentives for New Uses
  - Information on new beneficial uses of CCRs that are coming into the marketplace.
  - Specific incentives that EPA could provide that would increase the amount of CCRs that are beneficially used.
  - Information and data on the best means for estimating future quantities and changes in the beneficial use of CCRs, as well as on the price elasticity of CCR applications in the beneficial use market.
Requests for Information Related to Beneficial Use (continued)

- Stigma

- If EPA were to regulate CCRs as a “special waste subject to subtitle C” and stigma turns out to be an issue, what could EPA do that could reduce any stigmatic impact that might arise. We are seeking concrete data on actual instances where “stigma” has adversely affected beneficial use of CCRs and the causes of these adverse effects.

- Specific information on how stigma could cause procedural difficulties for state beneficial use programs, and measures EPA might adopt to mitigate these effects.

- For those who believe that regulating CCRs under subtitle C would raise liability issues, describe the types of liability and the basis/data/information on which these claims are made.

- Ideas on how to best estimate stigma effects for purposes of conducting regulatory impact analyses and provide data or methods to assist EPA in this effort.
And Finally


- Comments?
- Questions??