



# Disposal of Coal Combustion Residuals (CCR) from Electric Utilities and Independent Power Producers

## Overview of Final Rule

March 4, 2015



# Webinar Logistics and Materials

- Attendee's telephone lines are muted; please use the question pane on your screen to ask a question at any time during the webinar.
- We will try to answer as many questions as possible at the end of our presentation, but we may not get to all your questions. If we don't get to your question, you can email Steve Souders at [Souders.steve@epa.gov](mailto:Souders.steve@epa.gov).
- Since this webinar is designed to be an overview of the rule, we are not responding to site specific questions.
- The webinar will be recorded and posted to the website [www2.epa.gov/coalash](http://www2.epa.gov/coalash) shortly after the webinar.
- Presentation slides will also be posted to the website: [www.2.epa.gov/coalash](http://www.2.epa.gov/coalash).



# Introduction

- On December 19, 2014, the Administrator signed the final CCR rule.
- The rule establishes nationally applicable minimum criteria for the safe disposal of CCR in landfills and surface impoundments.
- CCR, also known as coal combustion residuals, coal combustion waste or coal ash is generated from burning coal for the purpose of generating electricity by electric utilities and independent power producers.
- CCR includes fly ash, bottom ash, boiler slag, and flue gas desulfurization (FGD) materials.



## Basic Statistics

- CCR is one of the largest waste streams generated in the U.S.
- In 2012, over 470 coal fired facilities burned over 800 million tons of coal, generating approximately 110 million tons of CCR in 47 states and Puerto Rico.
- CCR may be generated wet or dry.
- CCR is sent off-site for disposal or beneficial use or disposed onsite in landfills and surface impoundments.
- In 2012, 40% of CCR was beneficially used with 60% disposed, mostly onsite.
- There are over 310 active CCR landfills and 735 active CCR surface impoundments.
- The average size of a CCR landfill is slightly over 120 acres, with an average depth of 40 feet; CCR surface impoundments average slightly over 50 acres with an average depth of 20 feet.



# Background

- The proposed rule was published in the Federal Register on June 21, 2010.
- Two regulatory options were proposed – regulate CCR as non-hazardous (subtitle D of RCRA) or as a special waste (subtitle C of RCRA).
- The Agency received over 450,000 comments, conducted eight public hearings and published three Notices of Data Availability (NODAs).
- EPA finalized rule under a subtitle D, the solid waste or non-hazardous waste provisions of RCRA.
- EPA also deferred a final Bevill Regulatory Determination for the disposal of CCR.
- EPA reaffirmed that CCR going for beneficial use (BU) remain Bevill exempt. The rule provides a definition of beneficial use to clarify the distinction between BU and disposal.



# Regulation of CCR under Subtitle D of RCRA

- Rule establishes national minimum criteria for the disposal of CCR in landfills and surface impoundments.
- It provides a comprehensive regulatory program to address risks posed by:
  - Groundwater contamination
  - Structural failures of CCR surface impoundments; and
  - Fugitive dust emissions
- CCR units posing an unacceptable risk must retrofit or close. Unacceptable risks are:
  - CCR surface impoundments failing to achieve or determine “factors of safety.” These units must close.
  - Improper siting of CCR landfills or surface impoundments, which includes the inability to make the required engineering demonstrations. These units must close.
  - Leaking unlined surface impoundments. These units must retrofit to a composite liner or close.



## Subtitle D Regulatory Approach

- Rule is self-implementing meaning facilities must comply with requirements without regulatory oversight.
- A state is not required to adopt or implement the regulations or to develop a permit program; however, states are strongly encouraged to adopt the federal minimum criteria into their regulations, to revise their Solid Waste Management Plan (SWMP), and to submit the plan to EPA for approval.
- A state or tribal program does not operate “in lieu of” the federal regulations.
- Citizens, states, and tribes can enforce the requirements under RCRA citizen suit authority.
- EPA can use RCRA Section 7003 to address “imminent and substantial endangerment” situations; however, EPA cannot enforce the CCR regulations.
- EPA has developed a very transparent rule:
  - Requires owner/operator (o/o) to develop a publicly accessible website, post compliance information, notify State Directors of actions taken to comply with requirements.
  - Requires a qualified Professional Engineer (PE) to certify that the technical requirements of the rule are being met.



# State Solid Waste Management Plans

- Critical Role of States
  - Strongly encouraging States to adopt at least the minimum federal criteria into their regulations and to revise the SWMPs to demonstrate how the new minimum criteria will be implemented in the State and how the State will use the information the facilities must provide.
  - Strongly encouraging States to submit revised SWMPs to EPA for approval under the procedures in 40 CFR Part 256.
    - Under these regulations, EPA approves plans that at a minimum “meet the requirements of EPA’s guidelines”
    - EPA regulations require states to develop their plans through a public notice and comment process
    - EPA’s action on the State SWMP provides EPA’s opinion of the State regulations and implementation plan. Although this opinion will not preclude a citizen suit to enforce the federal regulations, EPA expects a court will give it substantial weight.
  - Key incentive for States to submit and obtain EPA approval on revised SWMPs is that States with approved programs may extend compliance deadlines up to five years from rule promulgation.
  - EPA developed this process in response to State concerns.





# Implementation Timeframes

- The rule becomes effective six months from publication in the Federal Register.
- New CCR landfills, new CCR surface impoundments and all lateral expansions must meet the technical criteria before any CCR is placed into the unit.
- Existing CCR surface impoundments and existing CCR landfills are subject to implementation timeframes established in the rule for the individual technical criteria.
- EPA developed these timeframes taking into account:
  - Time necessary to implement the requirements (e.g., installing groundwater monitoring wells.)
  - Other EPA rulemakings affecting the power generation sector and CCR units:
    - Effluent Limitations Guidelines and Standards for the Steam Electric Power Generating Point Source Category or the ELG Rule;
    - Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units or Clean Power Plant Rule.
- Timeframes are designed so that an O/O will not have to make decisions about their CCR unit(s) without full knowledge of what the other rules will require.



# Key Technical Provisions of the Final Rule

- Applicability
- Definitions
- Location Restrictions
- Design Standards – Liners and Structural Integrity
- Operating Standards
  - Fugitive Dust Control
  - Run-on/Run-off for Landfills
  - Hydrologic and Hydraulic Capacity Requirements for Surface Impoundments
  - Inspections for Surface Impoundments and Landfills
- Groundwater Monitoring and Corrective Action
- Closure and Post-Closure Care
- Recordkeeping, Notifications and Internet Posting
- Beneficial Use



# Applicability

Rule applies to:

- New and existing CCR landfills, new and existing CCR surface impoundments and any lateral expansion of these units that engage in the disposal of CCR that is generated from the combustion of coal by electric utilities and independent power producers (North American Industry Classification System (NAICS) code 221112).
- CCR units located both on-site and off-site.
- Inactive CCR surface impoundments located at active electric utilities:
  - If an inactive unit completes closure within 36 months of publication of the rule in the Federal Register, it is excluded from further regulation.
  - If closure is not completed within this time frame, unit is subject to all applicable requirements of the rule.



# Applicability

Technical requirements of the rule do not apply to:

- CCR landfills that have stopped receiving CCR prior to the effective date of the rule.
- CCR units at facilities that have ceased producing electricity prior to the effective date of the rule.
- CCR generated from non-utility boilers, e.g., manufacturing facilities, universities, hospitals.
- CCR that is beneficially used.
- CCR placement at active or abandoned underground or surface coal mines.
- Municipal Solid Waste Landfills (MSWLFs) that receive CCR.



## Definitions

- The rule finalized numerous definitions, key among them are:
  - CCR landfill
  - CCR surface impoundment
  - Existing CCR landfill
  - Existing CCR surface impoundment
  - CCR pile
  - Inactive CCR Surface impoundment
  - Beneficial use



## Location Restrictions

- Rule establishes five location restrictions to ensure units are appropriately sited:
  - Placement above the uppermost aquifer
  - Wetlands
  - Fault areas
  - Seismic impact zones
  - Unstable areas
- Units are prohibited from being sited in these areas unless specific demonstrations can be made.
- Demonstrations must be certified by a qualified PE.



## Location Restrictions

### Placement above the uppermost aquifer-

- Applies to new CCR landfills, existing and new CCR surface impoundments and all lateral expansions.
- Must be constructed with a base located no less than 1.52 meters (five feet) above the uppermost aquifer.
- Or must demonstrate that there will not be an intermittent, recurring, or sustained hydraulic connection between any portion of the base of the CCR unit and the uppermost aquifer due to normal fluctuations in groundwater elevations (including groundwater elevations during the wet season).
- Existing surface impoundments have 42 months from the date of publication to complete the demonstration. Those that fail to comply with either standard must cease receiving CCR and close in accord with requirements in the rule.
- New CCR units and any lateral expansion must complete the demonstration no later than the date of initial receipt of CCR in the unit.



# Location Restrictions

## Wetlands-

- Applies to new CCR landfills, existing and new CCR surface impoundments and all lateral expansions.
- Cannot be located in wetlands absent a specific demonstration made by the owner or operator that ensure the CCR unit will not degrade sensitive wetland ecosystems.
- The term 'wetlands' refers to those areas defined in 40 CFR 232.2 (e.g., marshes, swamps, bogs).
- Existing surface impoundments have 42 months from the date of publication to complete the demonstration. Those that fail to achieve this standard must cease receiving CCR and close in accordance with requirements in the rule.
- New CCR units and any lateral expansion must complete the demonstration no later than the date of initial receipt of CCR in the unit.





# Location Restrictions

## Fault areas-

- Applies to new CCR landfills, existing and new CCR surface impoundments and all lateral expansions.
- Cannot be located within 60 meters (200 feet) of the outermost damage zone of a Holocene fault absent a demonstration that an alternative setback distance of less than 60 meters (200 feet) will prevent damage to the structural integrity of the CCR unit.
- Existing surface impoundments have 42 months from the date of publication to complete the demonstration. Those that fail to achieve this standard must cease receiving CCR and close in accordance with requirements in the rule.
- New CCR units and any lateral expansion must complete the demonstration no later than the date of initial receipt of CCR in the CCR unit.



# Location Restrictions

## Seismic impact zones-

- Applies to new CCR landfills, existing and new CCR surface impoundments and all lateral expansions
- Cannot be located in a seismic impact zone absent a demonstration that all structural components including liners, leachate collection and removal systems, and surface water control systems, are designed to resist the maximum horizontal acceleration in lithified earth material for the site.
- Existing surface impoundments have 42 months from the date of publication to complete the demonstration. Those that fail to achieve this location criteria standard must cease receiving CCR and close in accordance with requirements of the rule.
- New CCR units and any lateral expansion must complete the demonstration no later than the date of initial receipt of CCR in the unit.



# Location Restrictions

## Unstable areas-

- Applies to existing and new CCR landfills, existing and new CCR surface impoundments and all lateral expansions.
- Cannot be located in an unstable area absent a demonstration that recognized and generally accepted good engineering practices have been incorporated into the design of the CCR unit to ensure that the integrity of the structural components of the CCR unit will not be disrupted.
- Existing landfills and surface impoundments have 42 months from the date of publication to complete the demonstration. Those that fail to achieve this standard must cease receiving CCR and close in accordance with requirements of the rule.
- New CCR units and any lateral expansion must complete the demonstration no later than the date of initial receipt of CCR in the unit.



# Liners

- Rule requires new CCR units to have either a composite or alternative composite liner.
  - The composite liner must consist of a(n):
    - Upper component consisting of a 30 mil geomembrane (GM); and
    - Lower component of at least two feet of compacted soil with a hydraulic conductivity of no more than  $1 \times 10^{-7}$  cm/sec.
    - A GM of high density polyethylene (HDPE) must be at least 60 mil thick.
    - The upper and lower component must be installed in direct and uniform contact with one another.
  - The alternative composite liner must consist of a(n):
    - Upper component consisting of a 30 mil geomembrane (GM); and
    - Lower component that is not a GM, with a liquid flow rate of no more than two feet of compacted soil with a hydraulic conductivity of no more than  $1 \times 10^{-7}$  cm/sec using Darcy's law.
    - If the lower component is compacted soil, the GM or upper component must be installed in direct and uniform contact.
- New CCR landfills must also have a leachate collection and removal system that maintains less than 30 centimeter depth of leachate over the liner.



# Liners

- Existing CCR landfills, regardless of liner type, can continue to operate for the remainder of their useful life.
- Existing CCR surface impoundments can continue to operate but must identify liner design (composite, alternative composite, or two foot layer of compacted soil with hydraulic conductivity no more than  $1 \times 10^{-7}$  cm/sec) no later than 18 months from the date of publication.
- Existing CCR surface impoundments that do not meet any of these three criteria for liner types or fail to make the designation within the specified timeframe are to be designated as “unlined.”
- Existing “unlined” CCR surface impoundments that, as a result of leakage, exceed a groundwater protection standard must retrofit or close in accordance with requirements of the rule.



## Vertical Expansions

- Unlike lateral expansions which are considered new units, vertical expansions of existing CCR landfills and surface impoundments are not subject to the provisions governing new units.
- Vertical expansions of a CCR surface impoundment resulting in a change from a “small” impoundment to a “large” impoundment or from an incised unit to an embanked or diked unit will become subject to additional technical requirements.
- Rule allows one year from the completion of the vertical expansion for the unit to come into compliance with the additional requirements.



# Overfills

- Overfills are defined as new CCR landfills constructed over closed CCR surface impoundments.
- To prevent the creation of structurally unstable units, overfills cannot be constructed unless the underlying unit has been dewatered, capped and completely closed in accordance with the requirements of the rule.
- These new units must independently comply with the technical requirements addressing:
  - foundation settlement
  - overall and slide slope stability
  - side slope and subgrade reinforcement
  - leachate collection
  - groundwater monitoring system requirements.



## Structural Integrity

- Except for incised units, owners or operators of all CCR surface impoundments are required to comply with technical requirements designed to maintain the structural integrity of the unit.
- All CCR surface impoundments must:
  - Identify unit with a permanent ID marker.
  - Conduct periodic hazard potential classification assessment.
    - High hazard
    - Significant hazard
    - Low hazard
  - Develop an Emergency Action Plan (EAP) if unit is designated as a “high” or “significant” hazard.
  - Cover embankment or dike slopes with either vegetation or an alternative form of slope protection.





# Structural Integrity

- Additional structural integrity requirements apply to CCR surface impoundments that exceed a specified size threshold:
  - A height of five feet or more and a storage volume of 20 acre feet or more; or
  - A height of 20 feet or more
- These units are required to:
  - Compile a history of construction(existing units) or design and construction plans (new units).
  - Conduct periodic structural stability assessments:
    - Must identify any structural stability deficiencies and recommended fix
    - O/O must remedy situation as soon as feasible
  - Conduct periodic safety factor assessments to ensure that unit meets:
    - A calculated static factor of safety (FOS) under end-of construction loading must equal or exceed 1.30 (new units only).
    - A calculated static FOS under long-term, maximum storage pool condition must equal or exceed 1.50.
    - A calculated FOS under the maximum surcharge pool loading condition must equal or exceed 1.40.
    - A calculated seismic factor of safety must equal or exceed 1.00.
    - The calculated liquefaction FOS must equal or exceed 1.20.



## Structural Integrity

- Units that fail to meet FOS or fail to conduct the FOS assessment must stop receiving CCR and initiate closure.
- All assessments (i.e., Hazard Potential, Structural Stability, Factor of Safety) must be conducted and completed within every five years.
- Key Implementation Dates (existing units):
  - Install a permanent marker within eight months of rule publication.
  - Compile a history of construction within 18 months of rule publication.
  - Complete the initial hazard potential classification assessment, structural stability assessment, and safety factor assessment within 18 months of rule publication.
  - Prepare an EAP, if applicable, within 24 months of rule publication.
- New units must meet all structural integrity requirements prior to placing CCR in unit.



# Fugitive Dust Controls

- Owners or operators of CCR units must adopt measures that will effectively minimize CCR from becoming airborne at the facility by:
  - Developing and operating in accordance with a fugitive dust plan with adequate dust control measures for each site.
    - Examples of control measures include: conditioning CCR with water or other liquid, locating CCR inside an enclosure or partial enclosure; operating a water spray or fogging system; using wind barriers, compaction, or vegetative covers; paving and sweeping roads; covering trucks transporting CCR; reducing or halting operations during high wind events; or applying a daily cover.
    - Logging of citizen complaints about fugitive dust.
  - Annual CCR fugitive dust report must record:
    - Controls used
    - Any citizen complaints received
    - Summary of any corrective actions taken



## Run-on and Run-off (RORO) Controls for CCR Landfills

- All landfills must have a RORO control system to:
  - Prevent flow onto the active portion of the CCR unit during the peak discharge from a 24-hour, 25-year storm.
  - Collect and control at least the water volume from a 24-hour, 25- year storm.
- O/O must prepare an initial RORO control system plan within 18 months of rule publication and revise these plans at a frequency no greater than every five years.
- RORO control system plans must document system design and construction, including engineering calculations.



# Hydrologic and Hydraulic Capacity Requirements for CCR Surface Impoundments

- All surface impoundments must have an inflow design flood control system to manage flow into and from the unit during and following the peak discharge of the inflow design flood.
- The inflow design flood is determined based on the hazard potential rating.
- Incised units must design for a 25-year flood.
- O/O must prepare initial and periodic (every five years) inflow design flood control plans documenting how system has been designed and constructed, including engineering calculations.



## Inspection Requirements for CCR Surface Impoundments

- All CCR surface impoundments must be inspected weekly by a qualified person for:
  - Any signs of structural weakness or other conditions that are disrupting or have the potential to disrupt the operation or safety of the unit.
  - Abnormal discoloration, flow, or discharge of debris or sediment from all outlets of hydraulic structures that pass underneath the base of through the dike of the unit.
- All CCR surface impoundments must also be inspected monthly by a qualified person to monitor instrumentation.



# Inspection Requirements for CCR Surface Impoundments

- Any CCR surface impoundment exceeding: (1) a height of five feet or more and a storage volume of 20 acre feet or more; or (2) a height of 20 feet or more must be inspected annually by a qualified PE to ensure that the design, construction, operation, and maintenance of the unit is consistent with recognized and generally accepted good engineering practices.
- These annual inspections must include:
  - A review of all available information/documentation regarding the status and condition of the unit.
  - Visual inspection of the unit and appurtenant structures (including any hydraulic structure underlying the base or passing through the dike of the unit) for signs of distress or malfunction.
- Inspection results must be entered into the operating record.
- If a deficiency or release is identified during any inspection, the owner or operator must remedy the deficiency or release as soon as feasible.
- Weekly inspections must begin six months from rule publication. The initial annual inspection must be completed nine months from rule publication.



# Inspection Requirements for CCR Landfills

- All CCR landfills must be inspected weekly by a qualified person for any signs of structural weakness or other conditions that are disrupting or have the potential to disrupt the operation or safety of the unit.
- All CCR landfills must be inspected annually by a qualified professional engineer.
- These annual inspections must include:
  - A review of all available information/documentation regarding the status and condition of the unit.
  - Visual inspection of the unit for signs of distress or malfunction of the unit.
- Inspection results must be entered into the operating record.
- If a deficiency or release is identified during any inspection, the owner or operator must remedy the deficiency or release as soon as feasible.
- Weekly inspections must begin six months from rule publication. The initial annual inspection must be completed nine months from rule publication.





# Groundwater Monitoring

- All CCR surface impoundments, landfills and lateral expansions must install a groundwater monitoring system and conduct groundwater monitoring. This includes inactive surface impoundments at active facilities unless they are closing within the three year timeframe.
- Must be in compliance with requirements (up through detection monitoring and determination of background levels) within two years of effective date of the rule.
- Requires an annual report certifying compliance, including data, to be posted on facility's website.
- Groundwater requirements must be met throughout active life and closure/post closure period.



# Groundwater Monitoring

- System Requirements
  - Performance standard: must consist of a sufficient number of wells, installed at appropriate locations and depths to yield groundwater samples from the uppermost aquifer that accurately represent background quality and the groundwater passing the waste boundary.
  - Minimum of one upgradient and three down gradient wells. Must justify using the minimum.
  - May choose to install a multi-unit system. PE must certify system is equally as capable of detecting monitored constituents at the waste boundary of the CCR unit as the individual groundwater monitoring system.



# Groundwater Sampling and Analysis

- Must specify sampling and analysis procedures and test methods.
- Must establish background levels.
- Number of samples for background: minimum of eight.
- Must choose statistical procedure to compare background to upgradient concentrations.
- Number of samples for assessment and detection monitoring must be consistent with statistical procedure chosen.



# Groundwater Detection Monitoring

- Must monitor semi-annually for Appendix III parameters:
  - Boron
  - Calcium
  - Chloride
  - Fluoride
  - pH
  - Sulfate
  - TDS
- Must determine if there has been a “statistically significant increase” (SSI) over background for each parameter.
- Can demonstrate SSI due to sampling and analysis (S&A) or other source error.
- If SSI detected, must establish Assessment Monitoring within 90 days.



# Groundwater Assessment Monitoring

- Must analyze for both Appendix III and Appendix IV parameters and constituents, resample within 90 days.
  - Antimony
  - Arsenic
  - Barium
  - Beryllium
  - Cadmium
  - Chromium
  - Cobalt
  - Fluoride
  - Lead
  - Lithium
  - Mercury
  - Molybdenum
  - Selenium
  - Thallium
  - Radium 226 and 228 combined
- Must establish groundwater protection standards (GWPSs) for each Appendix IV constituent.
- GWPS is MCL or background, whichever is higher.



## Groundwater Assessment Monitoring, continued

- If any Appendix IV constituents are determined to have SSI above the GWPS, must:
  - Characterize the nature and extent of the release
  - Install additional monitoring wells
  - Within 90 days, initiate an assessment of corrective measures.
- Can demonstrate that contamination is attributable to other source or SSI is due to sampling and analysis error.



# Assessment of Corrective Measures, Selection of Remedy, and Implementation of the Corrective Action Program

- Must include analysis of effectiveness of potential corrective measures.
- Must discuss the assessment in a public meeting before selecting remedy.
- Remedies must attain the GWPS for three consecutive years and control the source(s) of release.
- Remedies also must remove from the environment as much of the contaminated material that was released from the CCR unit as is feasible.
- Must specify a schedule for implementing and completing remedial activities.
- Within 90 days of selecting a remedy, must initiate remedial activities.
- Must take interim measures as necessary.



# Closure

- O/O must prepare closure and post-closure care plans.
- Closure of a CCR unit must be completed either by:
  - Leaving the CCR in place and installing a final cover system; or
  - Removing the CCR and decontaminating the unit (clean closure).
- Rule establishes timeframes to initiate and complete closure activities, and authorizes the O/O to obtain time extensions due to circumstances beyond the facility's control:
  - CCR landfills must complete closure within six months, with the possibility of one two-year extension.
  - CCR surface impoundments must complete closure within five years, with the possibility of one two-year extension for units smaller than 40 acres and five two-year extensions for units greater than 40 acres.
- Rule also establishes alternative closure procedures in situations where an owner or operator has no alternative disposal capacity or is permanently closing the coal-fired boiler in the foreseeable future.
- Extensions are not available for units that fail to demonstrate or meet factors of safety.





# Closure

- Closure of a CCR unit is triggered in one of three ways:
  - When the unit fails to meet one or more specific technical criteria:
    - Location restrictions
    - Leaking, unlined CCR surface impoundments
    - Fails to demonstrate or meet factors of safety
  - When the known final waste shipment or when the last known volume of CCR for beneficial use is removed.
  - When a unit is “idle” for more than two years (no receipt of CCR or removal of CCR for beneficial use).
- Rule provides procedures to rebut the presumptions for idled units, and obtain additional time, provided the O/O can make the required demonstration.



## Post Closure

- Owners or operators must prepare a post closure plan.
- Following closure, the owner or operator must:
  - Maintain integrity and effectiveness of final cover system;
  - If applicable, maintain integrity and effectiveness of leachate collection and removal system; and
  - Maintain groundwater monitoring system and continue monitoring groundwater.
- Owners or operators must continue post-closure care for 30 years:
  - If, however at the end of 30 years, the unit is operating under assessment monitoring, the O/O must continue to conduct post closure care until the O/O returns to detection monitoring.
- Units that “clean close” are not subject to these provisions.
- Inactive units closed within three years of publication are not subject to these provisions.



## Recordkeeping, Reporting and the Publicly Accessible Internet Site

- Owners or operators are required to document how the provisions of the rule are being met by placing information in an operating record and providing notification of these actions to the State Director/or the appropriate Tribal authority.
- Owners or operators must also establish and maintain a publicly accessible internet site that posts documentation that has in many instances also been entered into the operating record.
- Most files must be maintained in the operating record and on the internet site for five years.
- As long as the facility remains active, the following documents must be maintained:
  - Emergency Action Plan
  - Fugitive Dust Control Plan
  - Closure Plan
- State Directors and/or appropriate Tribal authority may request any demonstration or documentation required by the rule if such information is not available via the facility's publicly accessible internet site.



## Beneficial Use Aspects of Final Rule

- Does not regulate CCR that is beneficially used; the Bevill Determination remains unchanged.
- Provides a comprehensive definition of beneficial use to distinguish between beneficial use and disposal.
- Beneficial uses started six months after publication of the rule need to determine if they comply with the criteria contained in the definition of “beneficial use of CCR.”
- Rule clarifies that a use of a CCR that does not meet the definition of a beneficial use is disposal.



## Types of Beneficial Uses

- **Encapsulated beneficial uses** bind the CCR into a solid matrix that minimizes mobilization to the surrounding environment.
  - Examples: filler or lightweight aggregate in concrete, replacement for, or a raw material used in, the production of cementitious components in concrete or bricks.
- **Unencapsulated beneficial uses** do not bind the CCR into a solid matrix.
  - Examples: flowable fill, structural fill, soil modification/stabilization.



# Beneficial Use of CCR

*The Criteria only apply to CCR subject to this rule.*

- (1) The CCR must provide a functional benefit;
- (2) The CCR must substitute for the use of a virgin material, conserving natural resources that would otherwise need to be attained through practices such as extraction;
- (3) The use of CCR must meet relevant product specifications, regulatory standards, or design standards when available, and when such standards are not available, CCR must not be used in excess quantities; and
- (4) When **unencapsulated** use of CCR involves placement on the land of 12,400 tons or more in **non-roadway applications**, the user must demonstrate and provide documentation upon request, that environmental releases to ground water, surface water, soil, and air are comparable to or lower than those from analogous products made without CCR, or that releases will be below relevant regulatory and health-based benchmarks for human and ecological receptors.



## ***Criteria 1: CCR must provide a functional benefit***

- Ensures the CCR performs a function in the product or use; CCR must be a necessary component of the product.
- Examples:
  - CCR provides a functional benefit when used as a replacement for cement in concrete, the CCR increases the durability of the concrete and is more resistant against the degradation from salt water.
  - FGD gypsum serves the same function in wallboard production as mined gypsum.
  - CCR can be used to adjust the pH of soils thereby increasing and promoting plant growth.



## ***Criteria 2: CCR must substitute for the use of a virgin material***

- Ensures the use is “beneficial” from an environmental perspective.
- Examples:
  - FGD gypsum used as a substitute for mined gypsum reduces the need to use virgin gypsum.
  - Fly ash used as a substitute for Portland cement reduces the overall need for cement.
  - CCR used as substitutes for quarried natural materials in roadbed applications reduces the need to use extracted virgin materials.





***Criteria 3: The use of CCR must meet relevant product specifications, regulatory standards, or design standards when available, and when such standards are not available, CCR must not be used in excess quantities.***

- Addresses both the legitimacy of the use and the potential environmental and human health impacts associated with the use of excess quantities of CCR, particularly for unencapsulated CCR.
- Examples:
  - Fly ash used as a stabilized base course in highway construction is subject to both regulatory standards under DOT/FHA, and engineering specifications, such as ASTM C593 test for compaction, ASTM D560 freezing and thawing test, and a seven day compressive strength above 2760 (400 psi).
  - ASTM Standard E2277-03 provides guidance and a methodology for using CCR in structural fill, includes a consideration of engineering properties and behaviors, testing procedures and design considerations relevant to constructing a structural fill project.
- These standards provide information on design and construction practices, including amounts, that are typically used throughout the industry.



***Criteria 4: When unencapsulated use of CCR involves placement on the land of 12,400 tons or more in non-roadway applications, the user must demonstrate and provide documentation upon request, that environmental releases to ground water, surface water, soil, and air are comparable to or lower than those from analogous products made without CCR or that releases will be below relevant regulatory and health-based benchmarks for human and ecological receptors.***

- Ensures that unencapsulated uses are conducted in an environmentally protective manner.
- Requires users to address potential risks from ground water, surface water, soil, and air.
- Demonstrations should account for a wide variety of factors, such as site characterization, characterization of the CCR, hydraulic conductivity of the area, proximity of the material to water, contact with water, etc.
- There are a number of existing (or soon to be) sources of guidance and standards available to provide useful assistance for the demonstration:
  - Examples: the Agency is developing a framework to address the risks associated with the beneficial use of unencapsulated materials, and updating the Industrial Waste Evaluation Model.



# Summary of Key Technical Requirements

- Inactive CCR Surface Impoundments.
  - Rule applies to inactive CCR surface impoundments that contain both CCR and liquid located at active facilities.
  - If unit closes within three years of publication of rule, it is excluded from further regulation.
  - Inactive CCR landfills are not subject to the rule.
- Location Restrictions
  - Rule establishes five location criteria: placement above the uppermost aquifer, in wetlands, in fault areas, in seismic impact zones, and in unstable areas.
  - O/O of existing CCR surface impoundments must show compliance with all five criteria or initiate closure. Existing CCR landfills must show compliance only with the unstable area requirement.
  - New units must be in compliance with all five criteria before CCR is accepted.



# Summary of Key Technical Requirements

## • Liners

- Existing CCR landfills and surface impoundments can continue to operate for the remainder of their useful life; CCR surface impoundments, however must identify liner type and place in operating record and internet site.
- Existing CCR surface impoundments that are not lined with either a composite, alternative composite, or two foot layer of compacted soil with hydraulic conductivity no more than  $1 \times 10^{-7}$  cm/sec or that fail to make liner designation within 18 months of rule publication are to be designated as “unlined.”
- All new units (this includes any lateral expansion) must have either a composite or alternative composite liner.

## • Structural Stability

- All surface impoundments must determine hazard potential classification, develop an Emergency Action Plan if appropriate, conduct weekly inspections and monthly instrumentation inspections.
- CCR surface impoundments exceeding a specified size threshold must conduct routine structural stability assessments (i.e., at least every five years) including meeting specified factors of safety, and conduct annual inspections.



# Summary of Key Technical Requirements

- **Groundwater Monitoring and Corrective Action**
  - Required at all surface impoundments and landfills.
  - Phased approach to monitoring.
  - Exceedances over background or MCL trigger Corrective Action (closure for unlined surface impoundments.)
  - Covers releases beyond detection in groundwater (i.e., other releases of contaminants to the environment.)
  - Corrective Action Completion includes demonstration of compliance with groundwater protection standards, source control, and removal of contaminated material from the environment.



# Summary of Key Technical Requirements

## • Closure

- CCR landfills must complete closure within six months, with the possibility of one two-year extension.
- CCR surface impoundments must complete closure within five years, with the possibility of one two-year extension for units smaller than 40 acres and five two-year extensions for units greater than 40 acres.
- If existing CCR unit cannot meet specified location criteria, unit must initiate closure.
- If existing unlined CCR surface impoundments exceeds any groundwater protection standard, it must initiate closure.
- If a CCR surface impoundments fails to conduct a Factor of Safety (FOS) assessment or fails to meet a FOS assessment, the unit must initiate closure.

## • Beneficial Use

- Rule does not regulate CCR that is beneficially used.
- Rule contains a definition of beneficial use to distinguish it from disposal.



# Short Break

We're taking a short break while we review your questions.



# Additional Questions?

Please submit additional questions to Steve Souders  
at [souders.steve@epa.gov](mailto:souders.steve@epa.gov).