REGULATION AND POLICY CONCERNING MINE PLACEMENT OF COAL COMBUSTION WASTE IN SELECTED STATES

Final DRAFT
December 2002

DISCLAIMER:
This document is a working draft prepared by the U.S. Environmental Protection Agency (EPA). It is being shared with State and tribal mining regulatory authorities for their review and comment to EPA regarding completeness and accuracy. The information in this document is not for citation or attribution.

REGULATION AND POLICY CONCERNING MINE PLACEMENT OF COAL COMBUSTION WASTE IN SELECTED STATES

This report reviews and summarizes current State regulations and policy concerning the placement of coal combustion wastes (CCW) in surface and underground mines. Mine placement of CCW occurs most commonly in coal mines, but also occurs in noncoal mines (e.g., sand and gravel quarries, limestone mines, or clay mines). Mine placement may be conducted for two purposes:

- To dispose of the CCW as an alternative to disposal in a landfill or surface impoundment, and
- To achieve or assist in the reclamation of the mine, whether as part of ongoing operations or following the completion of mining (including abandoned mines).

Given these dual purposes, States may regulate the activity under mining and mine reclamation regulations, solid waste disposal regulations, or a combination of both. Therefore, this review examines both mining and solid waste regulatory programs and policy in the selected States. The review focuses on the following elements of State programs:

- Identification of the State agency(ies) with authority for overseeing the practice,
- The placement uses allowed or authorized,
- Whether the State makes a regulatory distinction between beneficial use and disposal at mine sites,
- Pre-placement site characterization requirements,
- Siting restrictions,
- Reclamation or placement plan requirements,
- Waste characterization requirements (both before and during placement),
- Waste characteristic limits,
- Whether (and how) operators are required to address acid-base balance issues,
- Whether regulatory approval is required for a project to proceed,
- Public participation requirements,
- Ground-water monitoring requirements (both during and after placement),
- Performance standards,
- Enforceable limits and corrective action provisions,
- Operational or placement engineering requirements,
- Performance bonding or financial assurance requirements, and

- Other closure and post-closure requirements.

The summary profiles of applicable State regulations, included herein for each State, often refer to the previous EPA report, titled *Regulation of Landfills and Surface Impoundments Managing Coal Combustion Waste in 26 States*, for greater detail in an effort to avoid redundancy. This report is referenced when the solid waste regulations pertaining to CCW placement in noncoal mines are similar to or the same as the solid waste regulations pertaining to CCW disposal in a landfill.

Research Methodology

This report combines the results of two parallel research efforts: one reviewing State regulations for coal mine placement of CCW and another reviewing State regulations for noncoal mine placement of CCW. States were selected for each effort using slightly differing methodologies. States reviewed for coal mine placement regulations were selected based on the number of coal mines in each State. States review for noncoal mine placement regulations were selected based on the estimated likelihood of CCW placement into noncoal mines within each State. This likelihood was estimated by establishing a ranking for each State which combined the number of noncoal mines within the State, the coal consumption by electric utilities within the State, and the regulatory requirements within each State. More specifically, SAIC obtained data from the United States Geological Service to create a ranking of States based on the number of sand, gravel, clay, and limestone mines in each of the 50 States. Data were taken from the Mineral Industry Survey Directories of Producers in the United States for each of the materials and a ranking of each State based on the number of noncoal mines was generated. Then, coal consumption data were obtained from the Energy Information Administration, Form EIA-759, "Monthly Power Plant Report" (1998). A combination of the two sets of data produced a ranking of the States believed to most likely have placement of CCW in noncoal mines. Finally, the ranking was adjusted to account for ten States that EPA was aware of from previous research to have specific regulations pertaining to placement of CCW in noncoal mines or loopholes in their solid waste regulations pertaining to "fill" projects that may allow the unregulated placement of CCW in noncoal mines.

There was considerable overlap in the list of States reviewed for each effort. Therefore, regulations for both types of mine placement (i.e., coal and noncoal) were reviewed for most of the States covered by this report. For a few States, however, regulations for only one type of mine placement were reviewed. In these States, the other type of placement is not known to be occurring or likely to occur in the future, based on EPA's estimates. For example, coal mine placement is not known to have occurred in Massachusetts and is not likely to occur in the future. Therefore, the review of Massachusetts' regulations focused on noncoal mine placement only. **Table 1** lists the States covered by this report and identifies the focus of the review for each State.

Table 1. States Reviewed for this Report		
Reviewed for both coal and noncoal mine placement regulations:	**Reviewed for coal mine placement regulations only:**	**Reviewed for noncoal mine placement regulations only:**
Alabama Arizona Colorado Illinois Indiana Kansas Kentucky Maryland Missouri Montana North Dakota Ohio Oklahoma Pennsylvania Tennessee Texas West Virginia	Alaska Arkansas Louisiana New Mexico Utah Virginia Washington Wyoming	Florida Georgia Iowa Massachusetts Michigan Minnesota Nebraska New York Wisconsin

For both efforts, the regulatory review was conducted primarily using the ENFLEX Federal and State Regulations and Federal and State Statutes databases. These databases contain the full text of the environment, health, safety, and hazardous materials transportation regulations and statutes for the Federal Government, all 50 States, the District of Columbia, and Puerto Rico. The databases are updated monthly. The review also utilized previous research and information obtained in support of EPA's Regulatory Determination on Wastes from the Combustion of Fossil Fuels (65 FR 32214, May 22, 2000), information available on State web sites, and information provided by State contacts. Where clarification of the regulatory language was necessary, appropriate State regulatory authorities were contacted. Citations to the specific regulatory sections reviewed and identification of any contacts made are included with each State summary.

Summary Tables

Where State coal mining regulations are applied to CCW placement, these regulations frequently are promulgated under the authority of the Federal Surface Mining Control and Reclamation Act of 1977 (SMCRA). In fact, many States' mining regulations are substantively similar or identical to Federal SMCRA regulations. As a result, an understanding of the Federal SMCRA regulations and their applicability to CCW placement is critical to this review of State programs. To assist with this understanding, **Table 2** summarizes SMCRA regulations and guidance from the implementing agency, the U.S. Department of Interior Office of Surface Mine Reclamation and Enforcement (OSM), applicable to CCW placement with regard to the review elements. It is important to note that because the Federal SMCRA regulations apply only to coal mines, many State programs similarly address CCW placement only in coal mines.

Table 3 summarizes the structure of the State regulations pertaining to mine placement of CCW in both coal and noncoal mines. A companion to this report, entitled *Mine Placement of Coal Combustion Waste: State Program Elements Analysis*, provides additional summary tables that identify program elements pertaining to mine placement oversight in each State.

The pages following the tables include State profiles that more fully describe each State's applicable policy and regulatory requirements. Where a State has programs for CCW placement in coal and noncoal mines, the programs are summarized in separate profiles.

Table 2. Federal SMCRA Regulations/Guidance Applicable to the Mine Placement of Coal Combustion Wastes	
Applicability	• Placement for reclamation of surface coal mines. • Placement for stabilization of underground mines. • Discharge into underground mines (fly ash and flue gas desulfurization sludge only). • Disposal at coal mine sites.
Before Placement	
Distinction Between Beneficial Use and Disposal	None specified
Site Characterization	The reclamation plan (see below) must include: • Geologic and hydrologic information. • Land use information. • Information on siltation, structures, impoundments, banks, dams, and diversions. • Protection of public parks and historic places. • Relocation or use of public roads. • Disposal of excess spoil. • Road systems. In addition, a probable hydrologic consequences (PHC) determination is required. *Under OSM guidance, the PHC should specifically address coal combustion waste placement.* The PHC must: • Determine the consequences of the proposed mining and reclamation operation upon the quality and quantity of surface and ground water. • Consider seasonal flow conditions for the proposed permit area and adjacent areas. • Be based on baseline hydrologic, geologic, and other information collected for the permit application • Must include findings on whether any adverse impacts may occur.
Siting Restrictions	Noncoal mine waste may not be disposed in a refuse pile or impounding structure. Noncoal mine waste disposal sites may not be located within 8 feet of any coal outcrop or coal storage area. (States vary in their interpretation of whether CCW is categorized as a noncoal mine waste.) In addition, unless the operator qualifies for an exemption, surface coal mining operations in general may not be conducted: • On any lands within the boundaries of the National Park System, the National Wildlife Refuge System, the National System of Trails, the National Wilderness Preservation System, the Wild and Scenic Rivers System, or National Recreation Areas. • On any Federal lands within a national forest. • On any lands where the operations would adversely affect parks or any place in the National Register of Historic Places. • Within 100 feet of any public road or cemetery. • Within 300 feet of occupied dwellings, parks, or public buildings.
Reclamation Plan	A reclamation plan that provides for protection of the environment, public safety, and, ideally, a new beneficial

Table 2. Federal SMCRA Regulations/Guidance Applicable to the Mine Placement of Coal Combustion Wastes	
	land use is required. *Under OSM guidance, the reclamation plan should address coal combustion waste placement.* The reclamation plan must include, at a minimum a: • Detailed timetable. • Detailed estimate of the cost. • Plan for backfilling, soil stabilization, compacting, and grading. • Plan for removal, storage, and redistribution of topsoil, subsoil, and other material. • Plan for revegetation. • Description of the measures to be used to maximize the use and conservation of the coal resource. • Description of measures to be employed to ensure that all debris, acid-forming and toxic-forming materials, and materials constituting a fire hazard are disposed of in accordance with 30 CFR 816.89 and 816.102. • Description, including appropriate cross sections and maps, of the measures to be used to seal or manage mine openings, and to plug, case, or manage exploration holes, other bore holes, wells, and other openings within the proposed permit area, in accordance with 30 CFR 816.13 through 816.15. • Description of steps to be taken to comply with the requirements of the Clean Air Act , the Clean Water Act, and other applicable air and water quality laws and regulations and health and safety standards. A hydrologic reclamation plan that is specific to the local hydrologic conditions also is required. The plan must contain the steps to be taken during the mining and reclamation through bond release to: • Minimize disturbances to the hydrologic balance within the permit and adjacent areas; to prevent material damage outside the permit area. ("Material damage" is not defined as it might apply to water resources.) • Meet the applicable Federal and State water quality laws and regulations. • Protect the rights of present water users. • Avoid acid or toxic drainage. • Prevent, to the extent possible using the best technology currently available, additional contributions of suspended solids to stream flow. • Provide water-treatment facilities when needed. • Control drainage. • Restore approximate pre-mining recharge capacity and protect or replace rights of present water users. *Under OSM guidance, the hydrologic reclamation plan and PHC determination (see above) should address coal combustion waste placement, including:* • *The probability of adverse impacts on the hydrologic balance.* • *Contamination of surface or ground-water supplies.* • *The time for manifestation of impacts to surface or ground-water supplies.*
Waste Characterization	Not required. The operator, however, must ensure that leachate and drainage from noncoal mine waste disposal

Table 2. Federal SMCRA Regulations/Guidance Applicable to the Mine Placement of Coal Combustion Wastes	
	areas does not degrade surface or ground water, which may necessitate performing waste characterization. (States vary in their interpretation of whether CCW is categorized as a noncoal mine waste.)
Waste Characteristic Limits	None specified
Address Acid-Base Balance/Acid Mine Drainage	Operators must handle earth materials, ground-water discharges, and runoff in a manner that minimizes the formation of acid or toxic drainage. (No specific methodology for addressing this is prescribed.)
Regulatory Approval Required to Proceed	A permit, issued by the SMCRA permitting authority, covering all coal mining operation and reclamation activities is required. The permit must be renewed every 5 years and is reviewed by the permitting authority at the middle of the permit term. *Under OSM guidance, the permit application should include identification of coal combustion waste placement areas.* Final disposal of noncoal mine waste shall be in a designated disposal site in the permit area or a State-approved solid waste disposal area. (States vary in their interpretation of whether CCW is categorized as a noncoal mine waste.)
Public Participation	SMCRA provides citizens with the right to petition the OSM to initiate a proceeding for the issuance, amendment, or repeal of any regulation under SMCRA. SMCRA also has public participation provisions for an application for a permit, a major revision of a permit, or a renewal of a permit. These provisions require public notice by the operator, allow the submission of public comments within 30 days of notice, and require public accessibility to the application, comments, and the final written decision of the permitting authority (the permitting authority must also notice their decision to the applicant, commenters, and local government officials). *Under OSM guidance, any permit revision application proposing coal combustion waste placement is a major permit revision subject to these requirements.*
During Placement	
Ongoing Waste Characterization	Not required. The operator, however, must ensure that leachate and drainage from noncoal mine waste disposal areas does not degrade surface or ground water, which may necessitate performing waste characterization. (States vary in their interpretation of whether CCW is categorized as a noncoal mine waste.)
Ground-water Monitoring	A ground-water monitoring plan based upon the PHC determination is required. The plan shall provide for: • Monitoring of parameters that relate to the suitability of the ground water for current and approved post-mining land uses and to the objectives for protection of hydrologic balance (see below under performance standards). • At a minimum, monitoring for TDS or specific conductance, pH, total iron, total manganese, and water levels. • Submission of data every three months. The regulatory authority may require additional monitoring.

Table 2. Federal SMCRA Regulations/Guidance Applicable to the Mine Placement of Coal Combustion Wastes	
Performance Standards	All surface mining and reclamation activities shall be conducted to: • Minimize disturbance to the hydrologic balance within the permit and adjacent areas. • Prevent material damage to the hydrologic balance outside the permit area. • Ensure protection or replacement of water rights. • Support approved post-mining land uses. *Under OSM guidance, these performance standards should be specifically applied to coal combustion waste placement.* For disposal of noncoal mine waste, placement and storage shall ensure that leachate and surface runoff do not degrade surface or ground water. (States vary in their interpretation of whether CCW is categorized as a noncoal mine waste.)
Enforceable Limits	Compliance with all applicable Federal and State water quality requirements, Federal and State air quality requirements, and Endangered Species Act provisions is required. Operations of noncoal mine waste disposal sites shall be conducted in compliance with all local, State, and Federal requirements. (States vary in their interpretation of whether CCW is categorized as a noncoal mine waste.)
Corrective Action	Each permit shall be subject to the following condition: the permittee shall take all possible steps to minimize any adverse impact to the environment or public health and safety resulting from noncompliance with any term or condition of the permit including, but not limited to: • Any accelerated or additional monitoring necessary to determine the nature and extent of noncompliance and the results of the noncompliance. • Immediate implementation of measures necessary to comply. • Warning, as soon as possible after learning of such noncompliance, any person whose health and safety is in imminent danger due to the noncompliance.
Operational Requirements/ Placement Engineering	Surface mining operators must develop an operation plan, air pollution control plan, and fish and wildlife protection and enhancement plan. The operation plan must include a description of the operation of facilities, such as impoundments, overburden and topsoil storage areas, and noncoal waste disposal areas. *Under OSM guidance, the operation plan should address coal combustion waste placement. Also under OSM guidance, the air pollution control plan should specifically address coal combustion waste placement operations, including fugitive dust control during transport and placement within the permit area.* Disturbed areas shall be backfilled and graded to: • Achieve the approximate original contour.

Table 2. Federal SMCRA Regulations/Guidance Applicable to the Mine Placement of Coal Combustion Wastes	
	• Eliminate all high walls, spoil piles, and depressions. • Achieve an appropriate post-mining slope. • Minimize erosion and water pollution. • Support the approved post-mining land use. *Under OSM guidance, coal combustion waste placement should comply with the backfill, grading, and approximate original contour requirements.* *Also under OSM guidance:* • *Coal combustion waste should not be disposed in mined-out areas if spoil would be displaced and disposed as excess spoil.* • *The timing of coal combustion waste placement operations should be based on completion of mining and reclamation operations in accordance with contemporaneous reclamation performance standards.* For noncoal mine waste disposal areas, wastes shall be routinely compacted and covered to prevent wind-borne waste. (States vary in their interpretation of whether CCW is categorized as a noncoal mine waste.)
Closure/Post Closure Care	
Ongoing Ground-water Monitoring	Ground-water monitoring as described above must proceed through the mining period and continue during reclamation until bond release.
Performance Bonding or Financial Assurance	A performance bond is required. • The bond(s) must cover the entire permit area. • The operator must file additional bonds to cover succeeding increments. • The operator must file both cumulative and incremental bond schedules. • Release of the performance bonds are contingent upon the successful completion of the reclamation plan (including revegetation). • The period of liability extends through the duration of the surface mining operation and through the "period of extended responsibility" for successful revegetation or until achievement of the reclamation requirements of the Act, regulatory programs, and permit, whichever is later. The "period of extended responsibility for successful revegetation" is defined as 5 years in areas of 26 inches or more rainfall (2 years if the lands are suitable for remining) and 10 years in areas of less than 26 inches of rainfall (5 years if the lands are suitable for remining).

Table 2. Federal SMCRA Regulations/Guidance Applicable to the Mine Placement of Coal Combustion Wastes	
Other Closure/Post-closure Requirements	Final disposal of noncoal mine wastes requires: • A minimum of 2 feet of soil cover. • Slope stabilization. • Revegetation. (States vary in their interpretation of whether CCW is categorized as a noncoal mine waste.)

Table 3. Summary of Structure of State Regulatory Programs for Mine Placement of CCW: Coal and Noncoal Mines

State	Coal Mine Placement				Noncoal Mine Placement			
	Currently Occurring	Applicable Mining Regulations	Applicable Solid Waste Regulations	Beneficial Use/ Disposal Distinction	Currently Occurring	Applicable Mining Regulations	Applicable Solid Waste Regulations	Beneficial Use/ Disposal Distinction
Alabama		X				X		
Alaska	X	X	X			NR	NR	NR
Arkansas		X	X			NR	NR	NR
Arizona	X	X(federal)	X				X	
Colorado	X	X	X		X	X	X	
Florida		NR	NR	NR			X	
Georgia		NR	NR	NR		X	X	
Illinois	X	X	X	X (based on purpose)		X	X	X (based on purpose)
Indiana	X	X		X (based on purpose)	X		X	X (based on purpose)
Iowa		NR	NR	NR		X	X	X (based on purpose)
Kansas		X	X		X		X	
Kentucky	X	X	X	X (based on purpose)			X	
Louisiana		X	X			NR	NR	NR
Massachusetts		NR	NR	NR	X		X	
Maryland	X	X	X		X	X		
Michigan		NR	NR	NR	X		X	
Minnesota		NR	NR	NR			X	

Key:
X Yes/applicable
NR Not Reviewed. This type of mine placement is not occurring and is not likely to occur in the future in this State. Therefore, applicable regulatory requirements were not reviewed for this report.
Blank No/Not-applicable

Table 3. Summary of Structure of State Regulatory Programs for Mine Placement of CCW: Coal and Noncoal Mines

State	Coal Mine Placement				Noncoal Mine Placement			
	Currently Occurring	Applicable Mining Regulations	Applicable Solid Waste Regulations	Beneficial Use/ Disposal Distinction	Currently Occurring	Applicable Mining Regulations	Applicable Solid Waste Regulations	Beneficial Use/ Disposal Distinction
Missouri	X	X	X	X (based on purpose & ecological risk)		X	X	X (based on purpose & ecological risk)
Montana	X	X			X	X	X	
Nebraska		NR	NR	NR			X	
New Mexico	X	X				NR	NR	NR
New York		NR	NR	NR	X	X	X	
North Dakota	X		X	X (based on purpose)			X	
Ohio	X	X	X	X (based on volume)		X	X	X (based on volume)
Oklahoma	X	X		X	X	X		X
Pennsylvania	X	X	X	X (based on environmental benefit)	X	X	X	
Tennessee		X(federal)	X			X	X	
Texas	X	X	X	X (based on purpose)			X	X (based on purpose)
Utah		X				NR	NR	NR
Virginia		X		X (based on purpose)		NR	NR	NR
Washington	X	X (federal)	X			NR	NR	NR
Wisconsin		NR	NR	NR	X	X	X	X (based on purpose)
West Virginia	X	X	X	X (based on volume)		X	X	
Wyoming	X	X	X			NR	NR	NR

Key:
X Yes/applicable
NR Not Reviewed. This type of mine placement is not occurring and is not likely to occur in the future in this State. Therefore, applicable regulatory requirements were not reviewed for this report.
Blank No/Not-applicable

ALABAMA: Coal Mines

In Alabama, the placement of CCW in mines is subject to applicable State mining regulations, which are substantively identical to the Federal SMCRA regulations. In addition, the Alabama Surface Mining Commission (SMC) has internal policy that specifically addresses CCW placement. This policy, among other things, requires that disposal of CCW in mine pits requires a permit from the Alabama Department of Environmental Management's Solid Waste Division (SWD). Alabama's solid waste program regulations, however, specifically EXCLUDE wastes which result from the combustion of coal at electric generating plants from the definition of industrial solid waste. For this reason, as stated by Andy Baker (DEM), CCW could not be considered a special waste either.[1] Therefore, any placement or disposal of CCW would not fall under the solid waste regulations or the authority of DEM.

References

Alabama Regulations: §§ 335-13-1-.03(12), (63), and (134)

AAC Chapter 880-X

Randall Johnson, Director, Surface Mining Commission (personal communication, 4/26/01)

Andy Baker, Waste Management, Department of Environmental Management (personal communication, 11/1/01)

[1] This is a different interpretation than originally reported in *Regulation and Policy Concerning Mine Placement of Coal Combustion Waste in 26 States (10/26/01 - working draft)*. In that report it was stated that CCW was exempt as an industrial solid waste but still could be considered a special waste.

ALABAMA	
Regulatory Agency Oversight	• Alabama Surface Mining Commission (SMC) • Alabama Department of Environmental Management, Solid Waste Division (SWD)
Allowed Uses	• Disposal in mine pits. • Placement on the surface of reclaimed sites.
Before Placement	
Distinction Between Beneficial Use and Disposal	None specified.
Site Characterization	*Substantively similar to federal SMCRA, no additional requirements.*
Siting Restrictions	*Substantively similar to federal SMCRA, no additional requirements.*
Reclamation Plan	*Substantively similar to federal SMCRA, no additional requirements.*
Waste Characterization	The SMC allows disposal of CCW on the surface of reclamation areas if tests are conducted demonstrating that it is suitable as a soil amendment and it does not contain toxic or hazardous materials which will contaminate ground or surface water. The internal policy does not prescribe specific procedures for this testing.
Waste Characteristic Limits	
Address Acid-Base Balance/Acid Mine Drainage	*Substantively similar to federal SMCRA, no additional requirements.*
State Approval Required to Proceed	SMC requires a major modification to the mining permit for CCW placement in mine pits (while use as a soil amendment would be a minor amendment). In addition, disposal in mine pits requires a solid waste disposal permit from SWD.
Public Participation	*Substantively similar to federal SMCRA, no additional requirements.*

ALABAMA	
During Placement	
Ongoing Waste Characterization	*Substantively similar to federal SMCRA, no additional requirements.*
Ground-water Monitoring	*Substantively similar to federal SMCRA, no additional requirements.*
Performance Standards	*Substantively similar to federal SMCRA, no additional requirements.*
Enforceable Limits	*Substantively similar to federal SMCRA, no additional requirements.*
Corrective Action	*Substantively similar to federal SMCRA, no additional requirements.*
Operational Requirements/ Placement Engineering	*Substantively similar to federal SMCRA, no additional requirements.*
Closure/Post Closure Care	
Ongoing Ground-water Monitoring	*Substantively similar to federal SMCRA, no additional requirements.*
Performance Bonding or Financial Assurance	*Substantively similar to federal SMCRA, no additional requirements.*
Other Closure/Post-closure Requirements	*Substantively similar to federal SMCRA, no additional requirements.*

ALABAMA: Noncoal Mines

In Alabama, CCW placement in a noncoal mine has yet to occur. If it were to occur, the Alabama Department of Industrial Relations (DIR), which is responsible for the abandoned mine and noncoal mining programs, would have sole jurisdiction over the activity. The concern would be that such an activity comply with mine reclamation guidelines. All surface mining operations must:

- Obtain a permit
- Leave at least a 50 foot setback, with no disturbance. The setback must have lateral support graded to a 3:1 slope or flatter, stabilized, mulched, fertilized, and planted in native grasses and legumes.
- Conduct surface mining operations in such a manner as to minimize their impact on water quality and ensure compliance with water quality standards
- Provide to the DIR a pollution abatement and/or prevention plan that includes the following:
  - < A plan for diverting surface water
  - < A narrative account of operations
  - < A plan to eliminate or minimize sediment
  - < The location of all streams in or adjacent to the mining area for determining the need for setbacks, buffer strips, or screens.
  - < Measures to minimize effects of any non-point source pollution
  - < Whether the mining operation will be in the watershed of a public water supply
- Comply with effluent limitations and monitoring requirements, if specified in the permit conditions
- Develop and implement a comprehensive reclamation plan.
- Grade and backfill highwalls to a 3:1 or flatter slope and provide soil stabilization and drainage control.
- Reclaim affected land through revegetation (at least 75% of affected land must have local, permanent-type grass coverage)
- Provide a reclamation bond. Bonds may be surety, negotiable, or cash.

The Department of Environmental Management's (DEM) solid waste program exempts CCW as a solid waste and, for this reason, as stated by Andy Baker (DEM), CCW could not be considered a special waste either.[2] Therefore, any placement or disposal of CCW would not fall under the solid waste regulations or the authority of DEM.

[2] This is a different interpretation than originally reported in *Regulation and Policy Concerning Mine Placement of Coal Combustion Waste in 26 States (10/26/01 - working draft)*. In that report it was stated that CCW was exempt as an industrial solid waste but still could be considered a special waste.

References

Alabama Statute: Act 99-579, Amendments to the Alabama Surface Mining Act of 1969 (effective10/1/99)

Alabama Regulations: 335-6-9; 335-13-1-.03; 480-3-6

Andy Baker, Waste Management, Department of Environmental Management (personal communication, 11/1/01)

Walter Cartwright, Surface Mining of Non-fuel Minerals, State Programs Division, Department of Industrial Relations (personal communication 11/5/01)

ALASKA: Coal Mines

In Alaska, the placement of CCW in mines is subject to applicable State mining regulations, which are substantively identical to the Federal SMCRA regulations. In addition, under the solid waste program, CCW is regulated as inert waste and, when placed in mines, is subject to applicable solid waste regulations. These regulations require a permit and include the following:

- Siting restrictions,
- State approval process,
- Ground-water monitoring (during and after placement) on a case-by-case basis,
- Corrective action, and
- Financial assurance.

Currently, all coal ash in Alaska comes from a single source – the Usibelli Coal Mine in Healy. They minefill the ash generated from their own operations.

References

Alaska Regulations: 18 AAC 60.990(64); 18 AAC 60.460; 11 AAC Chapter 90

Bruce Buzby, Division of Mining, Land, and Water, Alaska Department of Environmental Conservation (personal communication, 4/23/01)

Heather Stockard and Nancy Sonafrank, Solid Waste Management, Division of Environmental Health, Alaska Department of Environmental Conservation (personal communication, 4/20/01)

ALASKA	
Regulatory Agency Oversight	Alaska Department of Environment Conservation: • Division of Mining, Land, and Water • Division of Environmental Health, Solid Waste Management (SWM)
Allowed Uses	Mine placement.
Before Placement	
Distinction Between Beneficial Use and Disposal	None specified.
Site Characterization	*Substantively similar to federal SMCRA, no additional requirements.*
Siting Restrictions	*Substantively similar to federal SMCRA, plus:* • Not on slopes greater than 10% grade or on unstable soils. • Floodplain restrictions. • Not within 10 feet of highest measured level of an aquifer.
Reclamation Plan	*Substantively similar to federal SMCRA, no additional requirements.*
Waste Characterization	Not required *(as per federal SMCRA)*.
Waste Characteristic Limits	None specified *(as per federal SMCRA)*.
Address Acid-Base Balance/Acid Mine Drainage	*Substantively similar to federal SMCRA, no additional requirements.*
State Approval Required to Proceed	*Substantively similar to federal SMCRA, plus*: A standard inert waste disposal permit is required.
Public Participation	*Substantively similar to federal SMCRA, no additional requirements.*

ALASKA	
During Placement	
Ongoing Waste Characterization	Not required *(as per federal SMCRA).*
Ground-water Monitoring	*Substantively similar to federal SMCRA, plus:* Monitoring specific to CCW placement is required if SWM: • Determines that non-inert waste is or has been present at the site. • Detects evidence of a spill or ground-water contamination. • Finds unexplained contamination in nearby wells. If such monitoring is needed: • Must establish background water quality. • Detection monitoring required—must determine whether there is a statistically significant increase over background values. If so, assessment monitoring must be performed.
Performance Standards	*Substantively similar to federal SMCRA, no additional requirements.*
Enforceable Limits	*Substantively similar to federal SMCRA, no additional requirements.*
Corrective Action	*Substantively similar to federal SMCRA, plus:* Corrective measures must be performed if detection monitoring determines there is a statistically significant increase over background (see above).
Operational Requirements/ Placement Engineering	*Substantively similar to federal SMCRA, plus:* • No placement within 10 feet of highest measured level of an aquifer. • Compaction or other waste conditioning, as applicable, on a case-by-case basis.

ALASKA	
Closure/Post Closure Care	
Ongoing Ground-water Monitoring	*Substantively similar to federal SMCRA, plus:* If additional ground-water monitoring is required by SWM for the disposal period, it must continue through the post-closure care period.
Performance Bonding or Financial Assurance	*Substantively similar to federal SMCRA, plus:* SWM requires proof of financial responsibility for disposal area to cover closure and post-closure care using self-insurance, insurance, surety, or other guarantee approved by SWM.
Other Closure/Post-closure Requirements	*Substantively similar to federal SMCRA, no additional requirements.*

ARIZONA: Coal Mines

In Arizona, the placement of CCW in mines is subject to applicable Federal mining regulations – the mining program is administered by the US Department of the Interior's Office of Surface Mine Reclamation and Enforcement (OSM) rather than the State. Under the State's solid waste program, if CCW is classified as inert material by the Arizona Department of Environmental Quality (ADEQ), it is exempt from State solid waste permitting regulations. Inert material is defined as material that: 1) is not flammable, 2) will not decompose, 3) will not leach substances in concentrations that exceed applicable aquifer water quality standards when subjected to a water leach test that is designed to approximate natural infiltrating waters. If CCW is not classified as inert, the disposal of it would require the mine operator to provide ADEQ with a notice, operate in accordance with 40 CFR 257, and obtain an Aquifer Protection Permit (APP) (see *Regulation of Landfills and Surface Impoundments Managing Coal Combustion Waste in 26 States*, December 14, 2000). Specifically, the requirements address:

- Waste characterization,
- State approval process,
- Ground-water monitoring (during and after placement) on a case-by-case basis,
- Enforceable limits,
- Corrective action,
- Operational requirements/placement engineering,
- Financial assurance, and
- Closure

References

Arizona Statutes: ARS §§ 49-241, 49-701(15), 49-701.01(B)(17), 49-762.07(A), and 49-762.07(E)

Barry Abbott, Arizona Department of Environmental Quality, Waste Programs Division (personal communication, 5/4/01)

ARIZONA	
Regulatory Agency Oversight	• US Department of the Interior OSM • Arizona Department of Environmental Quality, Waste Programs Division
Allowed Uses	Mine placement.
Before Placement	
Distinction Between Beneficial Use and Disposal	None specified.
Site Characterization	*Regulated by OSM under federal SMCRA, no additional requirements.*
Siting Restrictions	*Regulated by OSM under federal SMCRA, no additional requirements.*
Reclamation Plan	*Regulated by OSM under federal SMCRA, no additional requirements.*
Waste Characterization	Characterization using a water leach test that is designed to approximate natural infiltrating waters is required to determine if the waste is subject to ADEQ permitting requirements.
Waste Characteristic Limits	None specified *(as per federal SMCRA)*.
Address Acid-Base Balance/Acid Mine Drainage	*Regulated by OSM under federal SMCRA, no additional requirements.*
State Approval Required to Proceed	*Regulated by OSM under federal SMCRA, plus:* If the CCW does not meet the definition of inert, an Aquifer Protection Permit from ADEQ would be required, and additional operating requirements would apply.
Public Participation	*Regulated by OSM under federal SMCRA, no additional requirements.*

ARIZONA	
During Placement	
Ongoing Waste Characterization	Not required *(as per federal SMCRA)*.
Ground-water Monitoring	*Regulated by OSM under federal SMCRA, plus:* If the CCW does not meet the definition of inert, additional ground-water monitoring may be required under the Aquifer Protection Permit.
Performance Standards	*Regulated by OSM under federal SMCRA, no additional requirements.*
Enforceable Limits	*Regulated by OSM under federal SMCRA, plus:* If the CCW does not meet the definition of inert, the Aquifer Protection Permit would establish a compliance boundary and alert levels that may trigger corrective action.
Corrective Action	*Regulated by OSM under federal SMCRA, plus:* If the CCW does not meet the definition of inert, Aquifer Protection Permit corrective action provisions would apply.
Operational Requirements/ Placement Engineering	*Regulated by OSM under federal SMCRA, plus:* If the CCW does not meet the definition of inert, additional operating requirements may be established under the Aquifer Protection Permit.
Closure/Post Closure Care	
Ongoing Ground-water Monitoring	*Regulated by OSM under federal SMCRA, plus:* If the CCW does not meet the definition of inert, additional ground-water monitoring may be required under the Aquifer Protection Permit.
Performance Bonding or Financial Assurance	*Regulated by OSM under federal SMCRA, plus:* If the CCW does not meet the definition of inert, Aquifer Protection Permit financial assurance requirements would apply.
Other Closure/Post-closure Requirements	*Regulated by OSM under federal SMCRA, plus:* If the CCW does not meet the definition of inert, closure and post-closure plans would be required under the Aquifer Protection Permit, with additional closure requirements determined on a case-by-case basis.

ARIZONA: Noncoal Mines

In Arizona, the placement of CCW in noncoal mines is not controlled by the State's mining program, which deals only with safety concerns. Rather, the Arizona Department of Environmental Quality (ADEQ)'s solid waste program has sole authority and applies the same requirements for CCW placement in noncoal mines as it does for coal mines. Under the State's solid waste program, if CCW is classified as inert material by the Arizona Department of Environmental Quality (ADEQ), it is exempt from State solid waste permitting regulations. Inert material is defined as material that: 1) is not flammable, 2) will not decompose, 3) will not leach substances in concentrations that exceed applicable aquifer water quality standards when subjected to a water leach test that is designed to approximate natural infiltrating waters. If CCW is not classified as inert, the disposal of it would require the mine operator to provide ADEQ with a notice, operate in accordance with 40 CFR 257, and obtain an Aquifer Protection Permit (APP) (see the Arizona summary profile for coal mines, found above, for more information).

References

Arizona Statutes: ARS §§ 49-701(15), 49-762.07(A), and 49-762.07(E)

Paul Catanzariti, Reclamation Specialist, Arizona State Mine Inspector's Office (personal communication, 10/18/01)

ARKANSAS: Coal Mines

In Arkansas, there is currently no placement of CCW in active mines. If placement were to occur, it would be subject to applicable State mining regulations, which are substantively similar to the Federal SMCRA regulations. In addition, since CCW is defined as industrial solid waste, a solid waste disposal permit would be required for mine placement, with review and approval from the Mining Division. According to Jerry Delavan of the Arkansas Department of Environmental Quality, internal policy would apply additional requirements to mine placement projects in the following areas:

- Waste characterization (pre-placement and during placement),
- Waste characteristic limits,
- State approval process,
- Ground-water monitoring, and
- Operational requirements/placement engineering.

References

Arkansas Statutes: ACA 15-58-101 to 15-58-510

Arkansas Regulations: APC & EC Solid Waste Regulation No. 22 §102; APC & EC Surface Coal Mining and Reclamation Code No. 20

Jerry Delavan, Arkansas Department of Environmental Quality, Solid Waste Management Division (personal communication, 4/24/01)

ARKANSAS	
Regulatory Agency Oversight	Arkansas Department of Environmental Quality: • Mining Division • Solid Waste Management Division
Allowed Uses	Mine placement.
Before Placement	
Distinction Between Beneficial Use and Disposal	None specified.
Site Characterization	*Substantively similar to federal SMCRA, no additional requirements.*
Siting Restrictions	*Substantively similar to federal SMCRA, no additional requirements.*
Reclamation Plan	*Substantively similar to federal SMCRA, no additional requirements.*
Waste Characterization	Under the solid waste program's internal policy, the CCW would need to pass a TCLP test prior to placement.
Waste Characteristic Limits	
Address Acid-Base Balance/Acid Mine Drainage	*Substantively similar to federal SMCRA, no additional requirements.*
State Approval Required to Proceed	*Substantively similar to federal SMCRA, plus:* A solid waste permit would be required, with review and approval by the Mining Division.
Public Participation	*Substantively similar to federal SMCRA, no additional requirements.*

ARKANSAS	
During Placement	
Ongoing Waste Characterization	Under the solid waste program's internal policy, the CCW would need to pass a TCLP test during active disposal.
Ground-water Monitoring	*Substantively similar to federal SMCRA, plus:* Under the solid waste program's internal policy, additional monitoring might be required.
Performance Standards	*Substantively similar to federal SMCRA, no additional requirements.*
Enforceable Limits	*Substantively similar to federal SMCRA, no additional requirements.*
Corrective Action	*Substantively similar to federal SMCRA, no additional requirements.*
Operational Requirements/ Placement Engineering	*Substantively similar to federal SMCRA, plus:* Under the solid waste program's internal policy, the site would need to meet an in-situ hydraulic conductivity standard of $1.0 \times 10^{-5.}$
Closure/Post Closure Care	
Ongoing Ground-water Monitoring	*Substantively similar to federal SMCRA, no additional requirements.*
Performance Bonding or Financial Assurance	*Substantively similar to federal SMCRA, no additional requirements.*
Other Closure/Post-closure Requirements	*Substantively similar to federal SMCRA, no additional requirements.*

COLORADO: Coal Mines

In Colorado, the Colorado Department of Natural Resources, Division of Minerals and Geology (CDMG) has dual jurisdiction with the Colorado Department of Public Health and the Environment, Solid Waste Division (CDPHE) for the disposal of CCW in mines. The activity is subject to applicable State mining regulations, which are substantively similar to the Federal SMCRA regulations. Specific requirements are determined on a site-by-site basis. CDMG, however, generally considers requirements in the following areas:

- Site characterization,
- Siting restrictions,
- Waste characterization (pre-placement and during placement),
- State approval process,
- Public participation,
- Ground-water monitoring,
- Enforceable limits,
- Operational requirements/placement engineering, and
- Financial assurance.

In addition, CCW is defined as industrial solid waste and its disposal in a mine requires a solid waste permit – issued by the local governmental entity under the authority of the CDPHE – called the Certification of Designation (see *Regulation of Landfills and Surface Impoundments Managing Coal Combustion Waste in 26 States*, December 14, 2000). The issuance of the Certificate of Designation involves coordination between CDMG, CDPHE, and the local government authority. The solid waste program could apply additional requirements to CCW placement projects under the Certificate of Designation, but has thus far deferred to CDMG's requirements.

References

Colorado Statutes: CRS 34-33-101

Colorado Regulations: 2 CCR 407-2; 6 CCR 1007-2-1.2

David Berry, Coal Program, Colorado Division of Minerals and Geology, Colorado Department of Natural Resources (personal communication, 4/26/01)

Glenn Mallory, Solid Waste Division, Colorado Department of Public Health and the Environment (personal communication, 5/21/01)

Mike Long, Division of Minerals and Geology, Colorado Department of Natural Resources. Presentation at IMCC Intergovernmental Forum on Mine Placement of Coal Combustion Wastes. May 15-16, 2001. St. Louis, Missouri.

Mike Long, Division of Minerals and Geology, Colorado Department of Natural Resources (written comments to EPA, 2/11/02)

COLORADO	
Regulatory Agency Oversight	• Colorado Department of Natural Resources, Division of Minerals and Geology (CDMG) • Colorado Department of Public Health and the Environment, Solid Waste Division (CDPHE) • Local governmental entities
Allowed Uses	Mine placement.
Before Placement	
Distinction Between Beneficial Use and Disposal	None specified.
Site Characterization	*Substantively similar to federal SMCRA, plus:* Requirements specific to CCW placement determined on a site-by-site basis. The two active CCW placement projects required a minimum of 12 months of background monitoring, plus geologic background data.
Siting Restrictions	*Substantively similar to federal SMCRA, plus:* Requirements specific to CCW placement determined on a site-by-site basis. The two active CCW placement projects required no disposal in the flood plain. Also, generally, placement of ash in coal mines is conducted to ensure isolation from the hydrologic system.
Reclamation Plan	*Substantively similar to federal SMCRA, no additional requirements.*
Waste Characterization	A detailed materials analysis is required. TCLP testing was required at one of the two active CCW placement projects.
Waste Characteristic Limits	None specified *(as per federal SMCRA)*.
Address Acid-Base Balance/Acid Mine Drainage	*Substantively similar to federal SMCRA, no additional requirements.*
State Approval Required to Proceed	*Substantively similar to federal SMCRA, plus:* In addition to permitting under the Colorado Surface Mining Reclamation Act, a Certificate of Designation is required. The process involves coordination between CDMG, CDPHE, and the local government authority responsible for issuing the Certificate of Designation for disposal.
Public Participation	Public notice and involvement are required under the Certificate of Designation and SMCRA programs. Citizen suits are allowed.

COLORADO	
During Placement	
Ongoing Waste Characterization	Required, details determined on a site-specific basis.
Ground-water Monitoring	*Substantively similar to federal SMCRA, plus:* Requirements specific to CCW placement determined on a site-by-site basis. The two active CCW placement projects require quarterly monitoring for all parameters, and monthly monitoring for indicators.
Performance Standards	*Substantively similar to federal SMCRA, no additional requirements.*
Enforceable Limits	*Substantively similar to federal SMCRA, plus:* Requirements specific to CCW placement determined on a site-by-site basis. The two active CCW placement projects have zero degradation standards for ground water.
Corrective Action	*Substantively similar to federal SMCRA, no additional requirements.*
Operational Requirements/ Placement Engineering	*Substantively similar to federal SMCRA, plus:* Requirements specific to CCW placement determined on a site-by-site basis. Generally: • Placement of ash in coal mines is conducted to ensure isolation from both the hydrologic system and with extensive cover to isolate the materials from any root zone. • CCW volume restrictions are determined on a site-by-site basis. • Annual hydrology and reclamation reports are required at the two active CCW placement projects.
Closure/Post Closure Care	
Ongoing Ground-water Monitoring	*Substantively similar to federal SMCRA, plus:* Additional monitoring requirements may be applied on a case-by-case basis.
Performance Bonding or Financial Assurance	*Substantively similar to federal SMCRA, plus:* Additional financial assurance requirements may be applied on a case-by-case basis.
Other Closure/Post-closure Requirements	*Substantively similar to federal SMCRA, no additional requirements.*

COLORADO: Noncoal Mines

As with coal mines, the Colorado Department of Natural Resources, Division of Minerals and Geology (CDMG) has dual jurisdiction with the Colorado Department of Public Health and the Environment, Solid Waste Division (CDPHE) for the disposal of CCW in noncoal mines. There is currently one placement project in a gravel pit.

CDMG has a mining regulatory program applicable to noncoal mines that is substantively similar to the SMCRA-based program for coal mines and the requirements for CCW placement in noncoal mines are implemented similarly to those described for coal mines (see the Colorado summary profile for coal mines, found above).

CDPHE applies the same requirements to CCW placement in noncoal mines as it does for coal mines. CCW is defined as industrial solid waste and its disposal in a mine requires a solid waste permit – issued by the local governmental entity under the authority of the CDPHE – called the Certification of Designation (see *Regulation of Landfills and Surface Impoundments Managing Coal Combustion Waste in 26 States*). The issuance of the Certificate of Designation involves coordination between CDMG, CDPHE, and the local government authority. The solid waste program could apply additional requirements to CCW placement projects under the Certificate of Designation, but has thus far deferred to CDMG's requirements.

References

Colorado Statutes: CRS 34-33-101

Colorado Regulations: 2 CCR 407-2; 6 CCR 1007-2-1.2

David Berry, Coal Program, Colorado Division of Minerals and Geology, Colorado Department of Natural Resources (personal communication, 4/26/01)

Glenn Mallory, Solid Waste Division, Colorado Department of Public Health and the Environment (personal communication, 5/21/01)

Mike Long, Division of Minerals and Geology, Colorado Department of Natural Resources. Presentation at IMCC Intergovernmental Forum on Mine Placement of Coal Combustion Wastes. May 15-16, 2001. St. Louis, Missouri.

FLORIDA: Noncoal Mines

In Florida, the placement of CCW at a noncoal mine site would fall under the sole jurisdiction of Bureau of Solid and Hazardous Waste (BSHW) and permitted as a solid waste disposal facility. The Bureau of Mine Reclamation (BMR) has regulatory authority for the reclamation of mines but the laws of the State of Florida do not provide for a mining permit. An operator of a mine must provide a Notice of Mining containing a reclamation plan to BMR. This notice is not a permit application and, in most cases, it is not officially approved by BMR. If the reclamation plan includes the use of the mine as a waste disposal facility, the statutes and rules that regulate waste disposal facilities would take precedence.

The applicable solid waste disposal permit requirements are as follows:

- Permit term of 5 years
- Public notice and comment
- Contingency plan

Performance Standards
- A landfill must be designed, constructed, operated, maintained, closed, and monitored throughout its design period to control the movement of waste and waste constituents into the environment so that water quality standards and criteria and air quality standards will not be violated.

Location
- Must provide adequate structural support for the total wastes to be disposed and the structures to be built.
- Can not be located in the 100-year floodplain.
- Minimum of 100 feet separation between waste deposits in the landfill and the boundary of the landfill property.
- Must be screened from public view where possible.
- The zone of discharge can not exceed 100 feet from the edge of the solid waste disposal unit.

Design
- Composite or double liners
- Leachate collection and removal system
- Surface water management system

Site Characterization
- Direction and rate of ground water and surface water flow
- Background quality of ground water and surface water
- Topography, solid types and characteristics, and surface water drainage systems of the site
- An inventory of all public and private water wells within a 1-mile radius of the site
- Geotechnical site investigation
  - < Evaluate and address fault areas, seismic impact zones, and unstable areas
  - < Estimate the average and maximum high ground-water table across the site

Operation
- Operation plan
- Waste compaction and daily application of cover
- Storm water and erosion controls
- Dust controls

Water Quality Monitoring
- Water quality monitoring plan describing ground-water (2 or more detection wells downgradient), surface water, and leachate monitoring systems
- Sample and analyze monitoring wells semi-annually.
- Evaluation monitoring, prevention measures, and corrective action required as necessary.

Closure
- Closure design plan (includes a description of any proposed final use of the site), closure operation plan, and closure procedures
- Final cover within 180 days afer the final waste deposit
- Revegetation

Post-closure
- Long-term care plan for 30 years from date of closing
- Continued water quality monitoring (plan may be modified)

Financial Assurance
- Financial assurance required for operation, corrective action, closure, and long-term care

References

Florida Regulations: Chapter 62-701 *et seq*.

Howard J. Hayes, Environmental Administrator, Bureau of Mine Reclamation (personal communication, 12/3/01)

Richard Tedder, Administrator of the Solid Waste Program, Bureau of Solid and Hazardous Waste (personal communication, 11/16/01)

GEORGIA: Noncoal Mines

Although it has yet to occur in Georgia, the disposal of CCW in noncoal mines would be controlled under both the mining and solid waste regulations. The mining and solid waste programs are administered together out of one office—the Solid Waste Management Program, Georgia Department of Natural Resources. The disposal of CCW, regulated as an industrial solid waste, in a noncoal mine would require a solid waste permit as described in *Regulation of Landfills and Surface Impoundments Managing Coal Combustion Waste in 26 States*. The activity would also have to be covered under the mining permit, requiring a minor amendment to the reclamation plan. A solid waste permit must be obtained before DNR will amend the mining plan to allow the activity.

The standards and criteria included in the mining permit regulations are as follows:

- Must submit a Mining Land Use Plan with:
  - < Provisions for protection of the environment and resources of the State (including historic places) and reclamation of affected lands in a reasonable period of time.
  - < A specific plan of action for accomplishing the reclamation objective and for protection of adjacent watershed from the effects of erosion and siltation.
  - < Measures for protecting the health and welfare of the people from the adverse effects of surface mining.
  - < Measures to provide protective barriers, such as dams and berms, between the lands to be affected and the waters or watersheds involved.
  - < A plan to alleviate and/or mitigate any adverse effects of impacts to adjacent lands containing natural or other resources.
  - < Grading to original elevation and plane.
  - < A description of any bodies of water to be altered in course or relocated
  - < A location map, land use map, and aerial photographs.
- May substitute and reclaim a previously mined site for lands currently being mined
- Final acceptable reclamation will be in conformance with Mining Land Use Plan and result in a neat, clean appearance with a high quality, permanent vegetative cover.
- Must have financial assurance in the form of a performance bond, governmental securities, irrevocable letter of credit, or cash. Amount required is between $1,000 and 2,500 per acre, to be determined by DNR. Release of the bond is contingent upon satisfactory reclamation in conformance with the Mining Land Use Plan, as determined by DNR.
- DNR is required to review and reevaluate, every five years, the site operation, the objectives of the land use plan, and estimated cost factors for completion of the plan and will make adjustments to bonding amount as necessary.

References

Georgia Regulations: Chapter 391-3-3

Georgia Statute: Sections 12-4-70 through 12-4-75

Harold Gillespie, Manager of the Solid Waste Management Program, Land Protection Branch, Environmental Protection Division, Georgia Department of Natural Resources (personal communication, 10/30/01)

Jeff Cown, Manager of the Surface Mining Unit, Solid Waste Management Program, Land Protection Branch, Environmental Protection Division, Georgia Department of Natural Resources (personal communication, 11/2/01)

ILLINOIS: Coal Mines

The Illinois Department of Natural Resources Office of Mines and Minerals (IOMM) has dual jurisdiction over disposal and beneficial use of CCW on abandoned and active mine sites with the Illinois Environmental Protection Agency (IEPA). The Illinois Environmental Protection Act allows for disposal of CCW in an active coal mine facility if the activity is provided for in the approved refuse disposal plan under the existing National Pollutant Discharge Elimination System (NPDES) and/or Subtitle D solid waste permits. Alternatively, the Act allows for disposal of CCW at an active coal mine if IOMM's CCW-specific disposal requirements are satisfied.

IOMM's CCW-specific disposal requirements (both law and policy) satisfy both the mining and the solid waste programs for CCW disposal. These requirements specify the need for separate approvals from IOMM and IEPA (which can be accomplished through a mining permit application or major revision) and include the following:

- Site characterization,
- Waste characterization (both pre-placement and during placement),
- Acid mine drainage
- State approval process,
- Ground-water monitoring,
- Performance standards,
- Enforceable limits,
- Corrective action, and
- Operational requirements/placement engineering.

These requirements apply to active mines only, the requirements for CCW minefilling in abandoned mines are coordinated by IOMM and IEPA on a case-specific basis.

In addition, the beneficial reuse of CCW is statutorily allowed by IOMM for several purposes including mine subsidence control, mine fire control, mine sealing, and mine reclamation. IOMM policy regarding such uses is included in the table below.

References

Illinois Statutes: 415 ILCS 5/21(r); 415 ILCS 5/3.94 (P.A. 89-93); 225 ILCS 720

Illinois Regulations: 62 Ill. Adm. Code 1700 - 1850

Land Reclamation Memorandums 92-11, 95-8, and 95-9

Dan Wheeler, Office of Mines and Minerals, Illinois Department of Natural Resources and Larry Crislip, Mine Pollution Program, Illinois Environmental Protection Agency. Presentation at IMCC Intergovernmental Forum on Mine Placement of Coal Combustion Wastes. May 15-16, 2001. St. Louis, Missouri.

Draft Final Report on Mine Placement Information Collection Visit to Illinois. December 11, 2002. U.S. EPA Office of Solid Waste.

ILLINOIS		
	Disposal	**Beneficial Use**
Regulatory Agency Oversight	• Illinois Office of Mines and Minerals (IOMM) • Illinois Environmental Protection Agency (IEPA)	
Allowed Uses	• Disposal in active mines.	• Mine subsidence control. • Mine fire control. • Mine sealing. • Mine reclamation.
Before Placement		
Distinction Between Beneficial Use and Disposal	To be classified as a beneficial use, the applicant must demonstrate that the CCW is being used beneficially.	
Site Characterization	*Substantively similar to federal SMCRA, plus:* A summary of ground-water monitoring data for wells in the vicinity of the disposal area needs to be submitted in application.	*Substantively similar to federal SMCRA, no additional requirements.*
Siting Restrictions	*Substantively similar to federal SMCRA, plus:* The proposed disposal site must be adjacent to/on the mine site.	*Substantively similar to federal SMCRA, no additional requirements.*
Reclamation Plan	*Substantively similar to federal SMCRA, plus:* The disposal plan proposal must include: • An accurate topographic map showing the proposed limits of the disposal area. • A detailed description of the storage, handling, and placement operations.	*Substantively similar to federal SMCRA, no additional requirements, plus:* Request for use of CCW must include: • A description of the CCW including the type and its source and an estimate of the quantity to be used. • A detailed description of the application demonstrating that the CCW is being used beneficially. • A reclamation plan for the CCW site. Any modifications to soil grading, covering and/or amendment, seeding and mulching activities related specifically to the application area shall be described.

ILLINOIS		
	Disposal	**Beneficial Use**
Waste Characterization	• Lab analysis for pH, alkalinity, acidity and TDS. • TCLP for 19 metals and appropriate leaching procedure for chloride, cyanide, fluoride, and sulfate. • A representative weighted composite for all constituents noted here, plus antimony, beryllium, and thallium.	• Evaluation for 19 constituents utilizing ASTM method D3987-85.
Waste Characteristic Limits	None specified *(as per federal SMCRA)*.	• May not exceed Class I Ground-water Standards for metals.
Address Acid-Base Balance/Acid Mine Drainage	pH must be maintained so as to prevent excessive leaching of metal ions. If co-disposed with refuse in an active pit, representative mixtures are analyzed and the composite leachate tests should have a pH between 6 and 9.	*Substantively similar to federal SMCRA, no additional requirements.*
State Approval Required to Proceed	*Substantively similar to federal SMCRA, plus:* Separate approvals (and separate permits) from IOMM and IEPA required. However, may be applied to jointly through an IOMM permit application or a major revision of an existing mining permit.	*Substantively similar to federal SMCRA, plus:* Beneficial uses may be applied for through a permit application, major or minor permit revision, or incidental boundary revision depending on the situation and magnitude of the changes proposed.
Public Participation	*Substantively similar to federal SMCRA, no additional requirements.*	*Substantively similar to federal SMCRA, no additional requirements.*
During Placement		
Ongoing Waste Characterization	• Quarterly sampling and reporting on each CCW source to establish baseline. Once baseline waste characteristics are consistently established, operator may request a modification of monitoring plan. • Any changes in CCW source materials or mixture requires notification and submission of chemical analysis of the alternative waste source material or mixture.	May be required on a case-by-case basis, depending on the source variability/consistency and the proposed beneficial use.
Ground-water Monitoring	*Substantively similar to federal SMCRA, plus:* IOMM or IEPA require additional parameters to be added to the plan based on the potential for leaching as determined	*Substantively similar to federal SMCRA, no additional requirements.*

ILLINOIS		
	Disposal	**Beneficial Use**
	by waste mixture testing.	
Performance Standards	Must demonstrate adequate measures will be used to protect surface water and ground water from contamination at levels prohibited by the Illinois Environmental Protection Act and the Illinois Ground-water Protection Act.	Must demonstrate that the use of the CCW will have no adverse impacts to the environment.
Enforceable Limits	*Substantively similar to federal SMCRA, plus:* May not exceed storm water and ground-water contamination levels established by the Illinois Environmental Protection Act and Ground-water Protection Act. If exceeded, corrective action requirements will apply.	*Substantively similar to federal SMCRA, no additional requirements.*
Corrective Action		
Operational Requirements/ Placement Engineering	*Substantively similar to federal SMCRA, plus:* • CCW must come from a company that has purchased coal from the mine. • The amount of CCW disposed may not exceed 35% of annual coal sales. • Adequate protection from wind and water erosion required, including: goal of no visible emissions, and minimize contact with surface water and direct precipitation. • Liners may be required for disposal in certain ground-water classes. In-situ fire clay can meet the liner requirement.	*Substantively similar to federal SMCRA, plus:* • CCW cannot be mixed with hazardous waste. • Erosion control measures. • Dust control measures. • Maps of application areas. • Speculative accumulation is not permitted. • Notification, documentation of quality, and certification of compliance are required.
Closure/Post Closure Care		
Ongoing Ground-water Monitoring	*Substantively similar to federal SMCRA,* plus: Additional monitoring may be required on a case-by-case basis by IOMM/IEPA.	*Substantively similar to federal SMCRA, no additional requirements.*
Performance Bonding or Financial Assurance	*Substantively similar to federal SMCRA, no additional requirements.*	*Substantively similar to federal SMCRA, no additional requirements.*

ILLINOIS		
	Disposal	**Beneficial Use**
Other Closure/Post-closure Requirements	*Substantively similar to federal SMCRA, plus:* For either disposal or beneficial use, final cover must be adequate to support continuous vegetation. Generally, this is four feet of final cover.	

ILLINOIS: Noncoal Mines

The placement of CCW in noncoal mines has yet to occur, but such an activity would be controlled under Illinois' mining program if considered a beneficial use and controlled under the solid waste program if considered disposal. Illinois statutorily defines CCW placement as beneficial use when used for mine subsidence, mine fire control, mine sealing, and mine reclamation. According to Ted Dragovich, Illinois Environmental Protection Agency (ILEPA), any use of CCW on a noncoal mine site that is covered by a permit from the Mines & Minerals Office is considered a beneficial use and does not require a solid waste permit. However, if the use is not covered under a mining permit, the use is considered disposal and a solid waste permit is required. The solid waste requirements are detailed in *Regulation of Landfills and Surface Impoundments Managing Coal Combustion Waste in 26 States*. The mining requirements and beneficial use conditions are described below.

A surface mining permit is required only where:

- Overburden exceeds ten feet in depth, or
- Where the surface mining and overburden area will affect more than 10 acres during the period of 1 year which shall be measured from July 1 to June 30 of the following year.

A surface mining permit requires the following:

- Public notice and comment
- Reclamation
  - < Reclamation planning
  - < Reclamation must be completed within 11 months after June 30th of the fiscal year in which the mining occurred
  - < Grading specifications (percentage requirements depends on original contour and post-mining land use)
  - < All runoff water must be impounded, drained, or treated so as to reduce soil erosion, damage to unmined lands and the pollution of streams and other waters.
  - < Acid forming materials present in the exposed face of the mined mineral seam(s) must be covered with not less than 4 feet of water or other materials.
  - < Suitable vegetative cover
  - < Compliance with criteria for each of three types of land reclamation: reforestation, pasture or crop, and recreational developments
- Financial assurance
  - < The amount of the security (i.e., surety bond, cash account, negotiable government securities, irrevocable letter of credit, or a CD) must be from $600 to $5,000 per acre with the exact amount determined by the State.

< The security remains in effect until the affected lands have been reclaimed, approved, and released by the State. The operator must complete and submit the "Notice of Completed Reclamation" form.

When CCW is beneficially used, as noted above, on a mine site the following conditions apply:

- The CCW must not be mixed with hazardous waste prior to use
- The CCW must not exceed Class I Ground-water Standards for metals when tested using test method ASTM D3987-85.
- Users of CCW must provide notification to the State documenting the quality of CCW used and certification of compliance with the two conditions above. Notification is not required for projects using less than 100 tons of CCW.
- Users of CCW must use dust controls
- CCW is not to be accumulated speculatively

References

Illinois Statutes: 415 ILCS 5/3.94 (9); 415 ILCS 5/21(r)

Illinois Regulations: 62 Ill. Adm. Code 300.10 - 300.180

Larry Crislip, Mine Pollution Program, Bureau of Water, Illinois Environmental Protection Agency (personal communication, 11/1/01)

Ted Dragovich, Manager of Disposal Alternatives Unit, Permits Section, Bureau of Land, Illinois Environmental Protection Agency (personal communication, 11/6/01)

Chris Liebman, Manager of Solid Waste Unit, Permits Section, Bureau of Land, Illinois Environmental Protection Agency (personal communication, 11/6/01)

Draft Final Report on Mine Placement Information Collection Visit to Illinois. December 11, 2002. U.S. EPA Office of Solid Waste.

INDIANA: Coal Mines

The Indiana Department of Natural Resources, Reclamation Division (DNR-RD) has sole jurisdiction over the disposal and beneficial use of CCW on active mine sites and has developed policies addressing both. The disposal of CCW at mining facilities regulated by DNR-RD (under the IC 14-34 mining regulations) and the beneficial uses of CCW (as defined by DNR-RD policy) are exempt from the State's solid waste regulations. Under Indiana statutes, DNR-RD's regulation of mine sites can be no more stringent than federal SMCRA regulations. However, this limitation does not apply to the oversight of mine placement of CCW. DNR-RD has adopted policy that specifically details how its SMCRA program requirements apply to the mine placement of CCW but more stringent requirements also apply.

The DNR-RD preliminarily adopted in November 1998 a proposed coal combustion waste disposal rule (published in the Indiana Register on February 1, 1999). However, it was determined that due to lack of statewide ground-water standards that would be part of the rule, it did not attain final adoption. The Indiana Department of Environmental Management (DEM) recently adopted ground-water standards. The DNR-RD has attained preliminary adoption to a rule that will implement these ground-water standards at mine sites, including those with the presence of CCW. Until such time, DNR-RD's CCW disposal program will continue to fall under the authority of DNR's policy Memorandum 92-1. This policy addresses the following:

- Site characterization,
- Siting restrictions,
- Reclamation plan,
- Waste characterization (both pre-placement and during placement),
- Waste characteristic limits,
- State approval process,
- Ground-water monitoring (both during and after placement),
- Operational requirements/placement engineering, and
- Closure requirements.

The DNR-RD's beneficial use policy (DNR Memorandum 99-2) allows for several beneficial uses of CCW at mine sites, including: mine subsidence, mine fire control, and mine sealing. These uses are not regulated by DNR (under either the mining or solid waste programs), but written notification must be provided to DNR-RD prior to the planned use.

References

Indiana Statutes: IC 13-19-3-3; IC 14-34

Indiana Regulations: 312 IAC 25

DNR Memorandum 92-1: Disposal of Coal Combustion Waste on Surface Coal Mines. June 8, 1992.

DNR Memorandum 99-2: Beneficial Use of Coal Combustion Waste. July 12, 1999.

Bruce Stevens, Director, Reclamation Division, Indiana Department of Natural Resources (personal communication, 4/30/01)

Bruce Stevens, Director, Reclamation Division, Indiana Department of Natural Resources. Presentation at IMCC Intergovernmental Forum on Mine Placement of Coal Combustion Wastes. May 15-16, 2001. St. Louis, Missouri.

Paul Ehret, Reclamation Division, Indiana Department of Natural Resources (written comments to EPA, 1/3/02)

Bruce Stevens, Director, Reclamation Division, Indiana Department of Natural Resources (written comments to EPA, 11/20/02)

INDIANA		
	Disposal	**Beneficial Use**
Regulatory Agency Oversight	• Indiana Department of Natural Resources, Reclamation Division (DNR-RD)	
Allowed Uses	• Disposal in active surface mines.	• Mine subsidence. • Mine fire control. • Mine sealing. • Road base • Anti-skid material
Before Placement		
Distinction Between Beneficial Use and Disposal	Any activity that is not listed in DNR's beneficial use policy (Memorandum 99-2) is considered disposal.	
Site Characterization	*Substantively similar to federal SMCRA, plus*: A minimum of six months of baseline monitoring for surface and ground water (within 1,000 feet of the permit area) is required.	*Substantively similar to federal SMCRA, no additional requirements.*
Siting Restrictions	*Substantively similar to federal SMCRA, plus*: • The evaluation of a proposal to dispose CCW on surface mines considers the proximity of public and private water supplies or other critical off-site features. • No disposal is permitted below the 100 year flood elevation.	*Substantively similar to federal SMCRA, no additional requirements.*
Reclamation Plan	*Substantively similar to federal SMCRA, plus*: • A description of how minimization of adverse impacts upon the prevailing hydrologic balance will be accomplished. • A description of approximate original contour, post-mining land use, and revegetation. • A description of the type of disposal operation (i.e., backfill, monofill). • Explain types of CCW to be disposed (e.g., fly ash, bottom ash, etc.).	*Substantively similar to federal SMCRA, plus:* The notification must: • describe the use so that DNR-RD can determine if it is a legitimate beneficial use in accordance with state law. • describe or provide a map of the area in which CCW is to be utilized. • identify the estimated proposed volume of CCW to be utilized. • provide an estimated timetable for the proposed usage.

INDIANA		
	Disposal	**Beneficial Use**
	• Provide total volume of CCW to be disposed.	
Waste Characterization	Bulk analysis, short- and long-term leaching tests that meet ASTM standards, includes 26 different constituents and parameters.	Not required *(as per federal SMCRA).*
Waste Characteristic Limits	Leach test concentrations must not be greater than one-quarter the RCRA limit.	None specified *(as per federal SMCRA).*
Address Acid-Base Balance/Acid Mine Drainage	While acid mine drainage is not problematic at permanent program sites, there are requirements for acid base accounting results to be reported for each waste stream proposed for disposal and for each stratum down to, and including, the stratum beneath the lowest coal seam to be mined.	*Substantively similar to federal SMCRA, no additional requirements.*
State Approval Required to Proceed	Disposal of CCW requires a significant permit revision, with full public notice and appeal procedures. Also, notification is provided to each landowner within the proposed permit area and within 300 feet outside the permit area.	Written notification is required, but no permit revision. The notifications are reviewed and if they are determined to be a legitimate beneficial use, a written acknowledgement is provided to the permittee within fifteen (15) days of receipt of the notification.
Public Participation	*Substantively similar to federal SMCRA, no additional requirements.*	
During Placement		
Ongoing Waste Characterization	Quarterly monitoring is required. Sampling frequency may later be reduced.	Not required *(as per federal SMCRA).*
Ground-water Monitoring	*Substantively similar to federal SMCRA, plus:* • Testing must be conducted for 33 parameters. • Ground water must be monitored at both upgradient and downgradient locations with at least one monitoring well in the expected path of leachate migration. • Results of the monitoring plan must be submitted in accordance with an approved schedule.	*Substantively similar to federal SMCRA, no additional requirements.*

INDIANA		
	Disposal	**Beneficial Use**
	Also, surface water monitoring is required to take place both upstream and downstream of the operation during and after placement of CCW and continues until total bond release. The monitoring is in addition to NPDES requirements.	
Performance Standards	*Substantively similar to federal SMCRA, no additional requirements.*	
Enforceable Limits	The Indiana Department of Environmental Management has recently adopted a ground-water standards rule. This rule is not yet in effect. The DNR-RD has attained preliminary adoption to a rule that will implement these ground-water standards. The DNR-RD's rulemaking will make the ground-water standards applicable to operations disposing of coal combustion waste.	*Substantively similar to federal SMCRA, no additional requirements.*
Corrective Action	*Substantively similar to federal SMCRA, no additional requirements.*	
Operational Requirements/ Placement Engineering	*Substantively similar to federal SMCRA, plus*: • Limited to CCW generated in Indiana or from coal mined in Indiana. • Can not exceed 10 feet of thickness unless approved as a monofill. • Can require a liner, but do not allow disposal in areas that would require a liner. DNR-RD maintains that in-situ fire clays almost universally meet liner equivalency requirements. • CCW volume restrictions can be incorporated on a site-specific basis. (Proposed requirements would implement a volume restriction of 50% of coal removed.) Operational plan must include: • Description of proposed compaction. • Description of the methods to reduce infiltration or contact with water (e.g., liners, caps, co-disposal with coal processing waste, etc.). Liners, in most	*Substantively similar to federal SMCRA, no additional requirements.*

INDIANA		
	Disposal	**Beneficial Use**
	circumstances, are not required. • Detailed maps, plans, and cross-sections. • A dust control plan.	
	Closure/Post Closure Care	
Ongoing Ground-water Monitoring	*Substantively similar to federal SMCRA, plus:* Monitoring for the additional parameters continues through bond release.	*Substantively similar to federal SMCRA, no additional requirements.*
Performance Bonding or Financial Assurance	*Substantively similar to federal SMCRA, no additional requirements.*	
Other Closure/Post-closure Requirements	*Substantively similar to federal SMCRA, plus*: Minimum final soil cover of five feet of non-toxic earthen material.	*Substantively similar to federal SMCRA, no additional requirements.*

INDIANA: Noncoal Mines

The Indiana Department of Environmental Management (IDEM) is the sole permitting authority for the placement of CCW on noncoal mine sites. CCW placement that constitutes disposal is regulated as a restricted waste landfill. Under Indiana's restricted waste regulations, there are four classifications of landfills. Based on the available characterization data, most coal combustion wastes would be amenable to management in Type III or IV landfills. Type IV landfills do not require a permit and the standards applicable to such landfills are limited to location standards and fugitive dust controls. Type III landfills do require a permit. The applicable solid waste regulations, found at 329 IAC 10, are summarized in *Regulation of Landfills and Surface Impoundments Managing Coal Combustion Waste in 26 States*.

The solid waste statutory language, under IC 13-19-3-3(2), also allows for the beneficial use of CCW for mine subsidence, mine fire control, and mine sealing. Such uses do not require a solid waste permit but written notification must be provided to IDEM prior to the planned use.

References

Indiana Statute: IC 13-19-3-3(2)

Indiana Regulations: 329 IAC 10

Bruce Palin, Assistant Commissioner, Indiana Department of Environmental Management (personal communication, 10/21/01)

Bruce Stevens, Director, Reclamation Division, Indiana Department of Natural Resources (personal communication, 10/15/01)

IOWA: Noncoal Mines

The Iowa Department of Natural Resources, Land Quality and Waste Management Assistance Division (DNR) is the sole permitting authority for the disposal of coal combustion waste in noncoal mines. If the mine is in operation, the Iowa Department of Agriculture and Land Stewardship, Division of Soil Conservation (IDALS) would be responsible for the operational part of the mine (i.e., registering, bonding, erosion controls, final grading and vegetation) but DNR would be responsible for the CCW disposal. According to IDALS, they would want to confer with DNR regarding the CCW disposal but would not move to issue any type of joint permit.

For disposal, DNR requires a solid waste permit as detailed in *Regulation of Landfills and Surface Impoundments Managing Coal Combustion Waste in 26 States*. If CCW is used for fill as part of mine reclamation, however, it would be considered beneficial reuse of solid waste and a solid waste permit would not be required. In such a case, the generator of the waste must have a solid waste reuse plan (with oversight by IDALS).

References

Kenneth Tow, Acting Director, Division of Soil Conservation, Iowa Department of Agriculture and Land Stewardship (personal communication, 10/15/01)

Lavoy Haage, Solid Waste Permitting Team Leader, Land Quality and Waste Management Assistance Division, Iowa Department of Natural Resources (personal communication, 10/17/01)

KANSAS: Coal Mines

In Kansas, there is currently placement of CCW in one limestone mine but no active coal mines. If CCW mine placement were to occur in an active coal mine, it would be subject to applicable State mining regulations, which are substantively similar to the Federal SMCRA regulations. According to Murray Balk of the Bureau of Environmental Remediation, Surface Mining Section, internal policy would apply additional requirements to mine placement projects in the following areas:

- Site characterization,
- Reclamation plan,
- Operational requirements/placement engineering, and
- Financial assurance.

In addition, since CCW is defined as industrial solid waste, a solid waste disposal permit would be required for mine placement activity. Kansas' solid waste permit requirements are summarized in *Regulation of Landfills and Surface Impoundments Managing Coal Combustion Waste in 26 States*, December 14, 2000. Because details regarding the applicability of these requirements to mine placement projects have not yet be tested through implementation, the requirements are not summarized here.

References

Kansas Statutes: KSA 65-3402(x); KSA 49 *et seq.*

Kansas Regulations: KAR 47-1 to 47-16

Murray Balk, Section Chief, Surface Mining Section, Bureau of Environmental Remediation, Kansas Department of Health and the Environment (personal communication, 4/24/01)

Stacey Balman, Bureau of Waste Management, Kansas Department of Health and the Environment (personal communication, 4/20/01)

KANSAS	
Regulatory Agency Oversight	Kansas Department of Health and the Environment: • Bureau of Environmental Remediation, Surface Mining Section (SMC) • Division of Environment, Bureau of Waste Management (BWM)
Allowed Uses	Mine placement.
Before Placement	
Distinction Between Beneficial Use and Disposal	None specified.
Site Characterization	*Substantively similar to federal SMCRA, plus:* Consideration would be made by the SMC as to the affect disposing of CCW would have on the hydrology and vegetation of the site.
Siting Restrictions	*Substantively similar to federal SMCRA, plus:* Additional restrictions may be imposed by the solid waste disposal permit.
Reclamation Plan	*Substantively similar to federal SMCRA, plus:* • Consideration would be made by the SMC as to the affect disposing of CCW would have on the reclamation plan. • SMC would also look at whether the additional material may cause excess spoil problems which may cause difficulty meeting the "approximate original contour" requirements.
Waste Characterization	Not required *(as per federal SMCRA).*
Waste Characteristic Limits	None specified *(as per federal SMCRA)*.
Address Acid-Base Balance/Acid Mine Drainage	*Substantively similar to federal SMCRA, no additional requirements.*
State Approval Required to Proceed	*Substantively similar to federal SMCRA, plus:* Solid waste disposal permit required.
Public Participation	*Substantively similar to federal SMCRA, no additional requirements.*

KANSAS	
During Placement	
Ongoing Waste Characterization	Not required *(as per federal SMCRA)*.
Ground-water Monitoring	*Substantively similar to federal SMCRA, plus:* Additional monitoring might be required under the solid waste permit.
Performance Standards	*Substantively similar to federal SMCRA, no additional requirements.*
Enforceable Limits	*Substantively similar to federal SMCRA, no additional requirements – Note that there are no specific standards or mechanisms for corrective action embodied in Kansas' solid waste regulations.*
Corrective Action	
Operational Requirements/ Placement Engineering	*Substantively similar to federal SMCRA, plus:* • Consideration would be made by the SMC as to the affect disposing of CCW would have on the operation plan. • Additional operational requirements might be imposed by the solid waste disposal permit.
Closure/Post Closure Care	
Ongoing Ground-water Monitoring	*Substantively similar to federal SMCRA, no additional requirements.*
Performance Bonding or Financial Assurance	*Substantively similar to federal SMCRA, plus:* Additional financial assurance requirements might be imposed by the solid waste disposal permit.
Other Closure/Post-closure Requirements	*Substantively similar to federal SMCRA, plus:* Additional closure/post-closure requirements might be imposed by the solid waste disposal permit.

KANSAS: Noncoal Mines

The Kansas Department of Health and the Environment's Bureau of Waste Management (KDHE) is the sole permitting authority for the placement of CCW in a noncoal mine. The Kansas State Conservation Commission is responsible for issuing mining permits and overseeing reclamation activity on noncoal mine sites but delegates responsibility for any disposal activity to KDHE. KDHE's solid waste permit requirements for CCW (as industrial solid wastes) are summarized in *Regulation of Landfills and Surface Impoundments Managing Coal Combustion Waste in 26 States*. Currently, there is placement of CCW in one limestone mine.

Reference

Dennis Baker, Land Reclamation Program Manager, State Conservation Commission (personal communication, 10/25/01)

KENTUCKY: Coal Mines

Currently, there are only two sites authorized for CCW mine placement in Kentucky. The Kentucky Department for Surface Mining, Reclamation and Enforcement (DSMRE) addresses the disposal of CCW at surface mines with specific statutory provisions (found at 28 KRS Chapter 350.270). The regulations require a modification of the mining permit and include the following:

- Site characterization,
- Siting restrictions,
- Reclamation plan,
- Waste characterization (both pre-placement and during placement),
- Waste characteristic limits,
- State approval process,
- Public participation,
- Ground-water monitoring (both during and after placement),
- Enforceable limits (determined on a site-by-site basis),
- Operational requirements/placement engineering,
- Financial assurance, and
- Closure requirements.

Kentucky's Department for Environmental Protection, Division of Waste Management (DWM) classifies CCW as special waste, but allows for reuse and beneficial uses of CCW under a solid waste permit-by-rule (found at 401 KAR 45:060). One reuse option includes disposal at active surface coal mining operations if the operator has a mining permit issued under 28 KRS Chapter 350 that includes the disposal of special waste. In such a case, the solid waste permit-by-rule defers entirely to the mining permit. In addition, the beneficial use of CCW as mine stabilization and reclamation material may be authorized under the solid waste permit-by-rule provided that:

- The use of CCWs does not result in a nuisance condition,
- Erosion and sediment controls are undertaken,
- The use is at least 100 feet from a stream and 300 feet from potable wells, wetlands or flood plains,
- The generator characterizes the nonhazardous nature of the CCWs, and
- The generator submits an annual report identifying characteristics about the ash reused and where it is reused.

No beneficial uses of CCW at mine sites have occurred yet, but, according to Carole Ball (DSMRE), it is anticipated that such uses will occur in the future in the areas of abandoned lands for reclamation, stabilization, and acid mine drainage control.

References

Kentucky Statutes: 28 KRS 350.270; 28 KRS 350

Kentucky Regulations: 401 KAR 45:010 and 45:060

Carol Ball, Kentucky Department for Surface Mining, Reclamation and Enforcement (personal communication, 4/18/01)

Karl Campbell, Kentucky Department for Surface Mining, Reclamation and Enforcement. Comments at IMCC Intergovernmental Forum on Mine Placement of Coal Combustion Wastes. May 15-16, 2001. St. Louis, Missouri.

KENTUCKY	
Regulatory Agency Oversight	Kentucky Natural Resources and Environmental Protection Cabinet: • Department for Surface Mining, Reclamation and Enforcement (DSMRE) • Department for Environmental Protection, Division of Waste Management (DEP-DWM)
Allowed Uses	Mine placement.
Before Placement	
Distinction Between Beneficial Use and Disposal	DEP-DWM permit-by-rule regulations classify use for mine stabilization and reclamation as beneficial use.
Site Characterization	*Substantively similar to federal SMCRA, plus:* • Application must include baseline data to characterize ground and surface water quality. • Maps are required showing each disposal location.
Siting Restrictions	*Substantively similar to federal SMCRA, plus:* • May be placed only in the pit or extraction area from which coal has been removed by surface mining (can go elsewhere if demonstrate no adverse impacts will occur). • Select area that will minimize water contact with the CCW. • Place CCW at least 4 feet above seasonal high water table that is proposed after mining. • Do not place CCW within 4 feet of final high wall, exposed coal seam, or coal outcrop. • For beneficial use under DEP-DWM permit-by-rule, the use must be at least 100 feet from a stream and 300 feet from potable wells, wetlands or flood plains.
Reclamation Plan	*Substantively similar to federal SMCRA, plus:* Application for disposal must include: • Legal right to conduct activity. • A public notice of the application. • Annual volume of CCW. • Description of proposed handling and disposal methods/operational procedures. • Description of measures to assure disposal won't threaten public health or disturb hydrologic balance.
Waste Characterization	Results of representative sampling and lab analysis of each component of the CCW is required. The analysis must include testing for 19 metals (specified in the statutory provisions), and the neutralization potential and potential acidity.

KENTUCKY	
Waste Characteristic Limits	• Must be non-hazardous as defined by KRS Chapter 224 and RCRA. • Must demonstrate that the CCW does not contain any contaminant at a concentration that meets or exceeds limits pursuant to KRS Chapter 224 and RCRA. • Additional limits determined on a site-by-site basis.
Address Acid-Base Balance/Acid Mine Drainage	*Substantively similar to federal SMCRA, no additional requirements.*
State Approval Required to Proceed	Amendment or a major permit revision application is required to include disposal of CCW in the surface mining permit, if the activity wasn't included in the original permit application. The activity is also covered under a solid waste permit-by-rule which defers entirely to the mining permit.
Public Participation	*Substantively similar to federal SMCRA, plus:* Public notice of disposal of CCW in the mining permit area is required.
During Placement	
Ongoing Waste Characterization	The generator must obtain and submit an annual laboratory analysis characterizing the CCW.
Ground-water Monitoring	*Substantively similar to federal SMCRA, plus:* Additional parameters determined by the DSMRE based on demonstrated characteristics of the CCW.
Performance Standards	*Substantively similar to federal SMCRA, no additional requirements.*
Enforceable Limits	*Substantively similar to federal SMCRA, plus:* Enforceable limits determined by DSMRE on a site-by-site basis.
Corrective Action	*Substantively similar to federal SMCRA, no additional requirements.*
Operational Requirements/ Placement Engineering	*Substantively similar to federal SMCRA, plus:* • Cannot mix CCW with low volume waste or material with hazardous waste characteristics. • CCW generated prior to a certain date may not be used, except on a case-by-case basis. • Place CCW at least 4 feet above seasonal high water table that is proposed after mining. • Do not place CCW within 4 feet of final high wall, exposed coal seam, or coal outcrop. • Prevent CCW from becoming airborne. • Keep records of the source and amount of CCW received. • Maintain accurate maps showing each location where CCWs have been disposed of, and the volumes disposed of at

KENTUCKY	
	each location. • Any material that is not the CCW approved for disposal must be removed. • Volume disposed can not exceed the in-place volumes of the marketable coal seams. • Can not result in greater amounts of excess spoil than if were not disposing CCW in mines. • Thickness shall not exceed 40 feet at any point.
Closure/Post Closure Care	
Ongoing Ground-water Monitoring	*Substantively similar to federal SMCRA, plus:* • Monitoring for the additional parameters is required until final bond release. • The monitoring must be conducted quarterly, except monitoring for the extra parameters due to disposal of CCW must be conducted semi-annually. • Monitoring for extra parameters may be reduced if those parameters show no increases of regulated levels after 4 monitoring events.
Performance Bonding or Financial Assurance	*Substantively similar to federal SMCRA, plus:* The performance bond required under the standard mining permit must cover disposal of CCW.
Other Closure/Post-closure Requirements	*Substantively similar to federal SMCRA, plus:* After disposal, CCW must be covered with at least 4 feet of non-acid forming spoil material.

KENTUCKY: Noncoal Mines

Kentucky's Department for Environmental Protection, Division of Waste Management (DWM) has sole jurisdiction over the disposal of CCW in noncoal mines. This activity would fall under the special waste landfill permitting program as detailed in *Regulation of Landfills and Surface Impoundments Managing Coal Combustion Waste in 26 States*[3].

References

Ron Gruzesky, Manager, Solid Waste Branch, Division of Waste Management, Kentucky Department of Environmental Protection (personal communication, 10/16/01)

Carol Ball, Kentucky Department for Surface Mining, Reclamation and Enforcement (personal communication, 10/16/01)

[3]The referenced report omits mention of the design criteria of a liner, leachate control system, and run-off control system that may be required on a case-by-case basis.

LOUISIANA: Coal Mines

In Louisiana, mine placement of CCW is not currently being done – one coal-burning power plant in the State disposes of its ash onsite. If CCW mine placement were to occur, it would be subject to applicable State mining regulations, which are substantively similar to Federal SMCRA regulations. Louisiana's solid waste program defines CCW as an industrial solid waste. According to the Office of Environmental Services' Permits Division, at present, the disposal of CCW is only allowed in permitted landfills and surface impoundments – not in mines.

References

Louisiana Regulations: 43 LAC 15

Tony Duplechin, Chief, Surface Mining Section, Injection & Mining Division, Louisiana Department of Natural Resources (personal communication, 4/30/01)

Tony Duplechin, Chief, Surface Mining Section, Injection & Mining Division, Louisiana Department of Natural Resources. Presentation at IMCC Intergovernmental Forum on Mine Placement of Coal Combustion Wastes. May 15-16, 2001. St. Louis, Missouri.

Thea Johnson, Louisiana Department of Environmental Quality, Office of Environmental Services, Permits Division (personal communication, 5/11/01)

MARYLAND: Coal Mines

CCWs are currently being used for reclamation activity at six coal mines and two non coal mines in Maryland. The Maryland Department of the Environment (MDE), Bureau of Mines has sole jurisdiction over the use/minefilling of CCW on mine sites. In such cases, the State's mining regulations, which are substantively similar to the federal SMCRA regulations, apply. In addition, the Bureau of Mines has issued policy guidelines for the use of CCW for mine reclamation. These guidelines require approval from the Bureau of Mines, but not a separate permit[4], and address the following for coal mines and aggregate mines:

- Site characterization,
- Reclamation plan,
- Waste characterization (pre-placement),
- Waste characteristic limits,
- State approval process, and
- Closure requirements.

MDE's Solid Waste Program allows the beneficial use of "pozzolans," including for the reclamation of mines. According to MDE, most coal ash (both fly ash and bottom ash) generated by pulverized coal plants operating in Maryland meets the definition of a pozzolan under Maryland law. Such ash is exempt from the requirement to obtain a solid waste disposal permit if the following beneficial use conditions are met:

- Sound engineering practices followed,
- Dust and wind erosion minimized, and
- All silt control regulations and permit requirements of the MDE met.

[4] For aggregate mine reclamation: In locations where there may be a threat to water quality, an NPDES or State permit to protect ground water may be necessary.

References

Maryland Statutes: MD ANN.CODE 15-407

Maryland Regulations: COMAR 26.04.07.04(C)(7); COMAR 26.20.01 *et seq.*

MDE Bureau of Mines Memo: Ash Utilization/Disposal Requests. March 10, 1997.

MDE Bureau of Mines Coal Ash Utilization/Disposal Request (form)

Mark Carney, Coal Mining Division, Bureau of Mines, Maryland Department of the Environment (personal communication, 4/30/01 and 6/15/01)

Edward Dexter, Chief, Field Operations & Projects Division, Solid Waste Program, Maryland Department of the Environment (personal communication, 5/4/01)

Connie Lyons, Mining Program, Maryland Department of the Environment. Presentation at IMCC Intergovernmental Forum on Mine Placement of Coal Combustion Wastes. May 15-16, 2001. St. Louis, Missouri.

MARYLAND	
Regulatory Agency Oversight	Maryland Department of the Environment: • Bureau of Mines, Coal Mining Division (coal mines) • Bureau of Mines, Minerals, Oil, and Gas Division (aggregate mines) • Solid Waste Program
Allowed Uses	• Aggregate mine reclamation or coal mine reclamation.
Before Placement	
Distinction Between Beneficial Use and Disposal	None specified.
Site Characterization	*Substantively similar to federal SMCRA, plus:* Water quality analysis for the mine permit drainage control system is required for 20 parameters.
Siting Restrictions	*Substantively similar to federal SMCRA, no additional requirements.*
Reclamation Plan	*Substantively similar to federal SMCRA, plus:* For coal mine reclamation, the following information is required: • General information from the applicant's coal mine permit. • A general disposal plan, including a map and narrative description of site handling, storage, and application procedures. Explanation of how dust will be controlled and how contamination of surface and ground water will be prevented. For aggregate mine reclamation, requirements are established on a site-by-site basis.
Waste Characterization	For coal mine reclamation: • Identification of the type and source of CCW. • Solids analysis for 14 parameters. • Leachate analysis (TCLP) for 11 parameters. For aggregate mine reclamation, requirements are established on a site-by-site basis.
Waste Characteristic Limits	For coal mine reclamation, CCWs must be nonhazardous, as demonstrated by TCLP analyses. For aggregate mine reclamation, limits are established on a site-by-site basis.
Address Acid-Base Balance/Acid Mine Drainage	*Substantively similar to federal SMCRA, no additional requirements.*

MARYLAND	
State Approval Required to Proceed	Must obtain approval from MDE through a minor amendment to the existing mining and reclamation permit.
Public Participation	*Substantively similar to federal SMCRA, no additional requirements.*
During Placement	
Ongoing Waste Characterization	Not required *(as per federal SMCRA)*
Ground-water Monitoring	*Substantively similar to federal SMCRA, no additional requirements.*
Performance Standards	*Substantively similar to federal SMCRA, no additional requirements.*
Enforceable Limits	*Substantively similar to federal SMCRA, no additional requirements.*
Corrective Action	*Substantively similar to federal SMCRA, no additional requirements.*
Operational Requirements/ Placement Engineering	*Substantively similar to federal SMCRA, no additional requirements.*
Closure/Post Closure Care	
Ongoing Ground-water Monitoring	*Substantively similar to federal SMCRA, no additional requirements.*
Performance Bonding or Financial Assurance	*Substantively similar to federal SMCRA, no additional requirements.*
Other Closure/Post-closure Requirements	*Substantively similar to federal SMCRA, no additional requirements.*

MARYLAND: Noncoal Mines

As with coal mines, the Maryland Department of the Environment (MDE), Bureau of Mines has sole jurisdiction over the use/minefilling of CCW on noncoal (aggregate) mine sites. CCWs are currently being used for reclamation activity at two aggregate mines. MDE regulates the activity through the aggregate mine's mining and reclamation permit, NPDES permit (through the required pollution prevention plan), and CCW-specific policy. MDE's policy guidelines for the use of CCW for aggregate mine reclamation are currently unwritten, internal guidelines but are similar to the 1997 Ash Utilization/Disposal Requests policy guidelines applicable to coal mines (detailed above in Maryland's summary profile for coal mines). Some policy considerations include:

- Location (placement must occur at least 4 feet above the ground-water table),
- Ground-water monitoring,
- Reclamation plan,
- Waste characterization,
- Waste characteristic limits, and
- Closure requirements.

The mining and reclamation permit regulations for aggregate mines require the following:

Setback Requirements
- At least 25 feet from any property line, but a greater distance may be required if adjacent to any school, hospital, church, cemetery, river, stream, or similar area.
- At least 100 feet from scenic and wild rivers or any parcel of land designated as an area of critical State concern.

Reclamation Plan and Schedule
- Completion within two years of final mineral extraction (extensions may be requested)
- Grading and sediment control plan
- Backfilling and grading
  - < Compaction of the fill materials in conformance with good engineering practices, if the post-mining land use includes roads, building sites, or other improvements
  - < Proper final slope gradient
- Revegetate all affected areas

Financial Assurance

- Liability under the bond is for the duration of the mining permit and for a period of 5 years after the permit's expiration date.
- The bond may be released before the time specified above if the State determines that the reclamation has been completed in accordance with the permit, the approved mining and reclamation plan, and the topographic map.
- The State may make partial release of the bond in proportion to the amount of land reclaimed. The regulations specify the reclamation conditions that must be met for partial release.

In addition to the mining and reclamation permit and the CCW mine placement policy, MDE's Solid Waste Program has guidelines for the beneficial use of "pozzolans," including for the reclamation of mines. According to MDE, most coal ash (both fly ash and bottom ash) generated by pulverized coal plants operating in Maryland meets the definition of a pozzolan under Maryland law. Such ash is exempt from the requirement to obtain a solid waste disposal permit if the following beneficial use conditions are met:

- Sound engineering practices followed,
- Dust and wind erosion minimized, and
- All silt control regulations and permit requirements of the MDE met.

References

Maryland Statutes: MD ANN.CODE 15-407

Maryland Regulations: COMAR 26.04.07.04(C)(7); COMAR 26.21.01 *et seq.*

MDE Bureau of Mines Memo: Ash Utilization/Disposal Requests. March 10, 1997.

MDE Bureau of Mines Coal Ash Utilization/Disposal Request (form)

Edward Dexter, Chief, Field Operations & Projects Division, Solid Waste Program, Maryland Department of the Environment (personal communication, 5/4/01)

Ed Larrimore, Mining Program, Maryland Department of the Environment (personal communication, 2/11/01)

Connie Lyons, Mining Program, Maryland Department of the Environment. Presentation at IMCC Intergovernmental Forum on Mine Placement of Coal Combustion Wastes. May 15-16, 2001. St. Louis, Missouri.

MASSACHUSETTS: Noncoal Mines

In Massachusetts, CCW placement in noncoal mines is under the sole jurisdiction of the Massachusetts Department of Environmental Protection (DEP). However, Massachusetts law at M.G.L. 111, Section 150A, exempts the beneficial use of CCW as fill from solid waste permitting and other regulatory requirements. All CCW placement in noncoal mines in Massachusetts to date has occurred under this provision. However, a bill is pending that will preclude the use of CCW as fill without getting a permit and will require a permit for all CCW disposal. According to Paul Emond, DEP, the bill will likely be passed but DEP will retain the authority to waive some requirements on a single-waste landfill on a case-by-case basis.

References

Massachusetts Statute: M.G.L. 111, Section 150A

Paul Emond, Solid Waste Program, Massachusetts Department of Environmental Protection (personal communication, 10/15/01)

MICHIGAN: Noncoal Mines

There is currently CCW placement in one limestone mine in Michigan. The State's mineral mines regulatory programs do not contain provisions specifically addressing the placement of CCW. The Michigan Department of Environmental Quality, Waste Management Division, however, manages CCW under solid waste regulations that specifically address its use as the sole material in a depository designed to reclaim, develop, or otherwise enhance land. The regulations require reclamation plan approval rather than a solid waste disposal permit (CCW is exempt as a solid waste if used and approved in accordance with the CCW-specific regulations) and include the following:

Site characterization:
- Must include topographic maps, and documentation of landowner authorization.
- Must demonstrate that site conditions are sufficient to prevent the migration of ash constituents in a manner that will violate water quality performance standards.
- Non-inert ash projects must include engineering plans and hydrogeological report demonstrating certain water quality performance standards.

Siting restrictions:
- No closer than 100 ft. to adjacent property lines, road rights-of-way, or lakes and perennial streams closer than 300 ft. to domiciles (greater distances required in certain situations).
- Not within a floodplain or wetland (some possible exceptions).

Reclamation plan:
- Must be approved by the DEQ. It will be approved if the rule requirements and any other applicable State law are followed and the activity is demonstrated to not create a nuisance.
- Describes how the proposed use will reclaim, develop, or enhance the land.
- Demonstrates that the ash is either inert, that the site conditions are sufficient to prevent the migration of constituents, or that the plan is otherwise protective of human health and the environment.

Waste characterization and waste characteristic limits:
- Must demonstrate ash is inert (non-inert ash may still be disposed but with additional requirements). Ash is considered inert if the generator notifies DEQ of the reuse, maintains characterization records for at least 3 years, and demonstrates that the concentration of hazardous substances in the CCW is below one of the following criteria: (1) the background concentration of the substance(s) in

question, (2) the method detection limit for the substance(s), and (3) the Type B criteria for soil (which means the concentrations must be at levels as required to protect surface and ground water and against unacceptable risk through direct contact, and TCLP testing must demonstrate compliance with ground-water criteria.)
- Additional limits established on a site-by-site basis.

Closure requirements:
- Closure plan required, including overall description of the methods, procedures, processes, and schedule that will be used; and description of final cover, including engineering plans and specifications.
- Restrictive covenant.
- Restrictions on post-closure use.

References

Michigan Regulations: Solid Waste Management, General Provisions, R 299.4113- 4119, 4305, 4446, and 5711.

Joan Peck, Michigan Department of Environmental Quality, Waste Management Division (personal communication, 6/11/01)

MINNESOTA: Noncoal Mines

In Minnesota, CCW placement on noncoal mines has yet to occur. If it were to occur, the Minnesota Pollution Control Agency (MPCA) would be the lead permitting authority and a solid waste disposal permit would be required. The solid waste regulations for disposal of municipal solid waste combustor ash would be applied to the CCW activity. The applicable regulations are outlined below. According to Jim Chiles (MPCA), however, the State's noncoal mines would most likely not ever be used for disposal.

A solid waste permit for CCW mine placement would require:

- Public notice and comment

Location
- Not in a floodplain
- Not within a shoreland or wild and scenic river land use district
- Not within a wetland
- Not within a location where emissions of air pollutants would violate the ambient air quality standards
- Must be in an area where the topography, geology, and ground-water conditions allow the facility to be designed, operated, constructed, ad maintained in a manner that minimizes environmental impacts
- Must be in an area where it is feasible to construct a monitoring system and where pollutants can be contained and corrective actions.

Design. Must include:
- A liner system. Liner standards depend on waste analysis leach results.
- A leachate collection and treatment system
- A water monitoring system. Required for ground water, on a case-by-case basis for surface water.

Waste Characterization
- Must sample at least quarterly for a set of parameters and annually for a second set of parameters
- The samples must be analyzed for total composition, leaching potential, and physical characteristics (includes EPA Methods 1311 and 1312 leach tests)
- Must comply with specified maximum leachable contaminant levels

Facility Operation
- Intermittent cover (at least once every 48 hours)
- Fugitive dust controls
- Ash must be spread and compacted in layers which are one foot or less in depth before compaction.
- Leachate must be sampled and analyzed.
- Ground water must be sampled and analyzed.
- Surface water is to be sampled and analyzed on a case-by-case basis.
- If necessary, corrective actions must be taken to prevent adverse impacts on water supplies and to return the facility to compliance with ground-water and surface water quality standards.

Closure
- Closure of each fill phase must be started within 30 days of reaching final permitted waste elevations.
- Final cover consisting of a barrier layer, a drainage layer, and a top revegetated layer.
- Submit a closure certification. The certification must contain: a completed and signed Site Closure Record and as-built plans showing changes from the original design plans; testing results indicating compliance with final cover, waste removal, equipment decontamination, and other closure requirements; and other forms of documentation such as pictures showing the construction techniques used during closure

Post-closure
- Post-closure care must continue for at least 20 years after the date of completing closure.
- Maintain the integrity of the final cover. Prevent run-on and run-off from damaging the cover.
- Continue to operate the leachate collection and removal system
- Continue to monitor

Financial Assurance
- Required for closure and post-closure care and any corrective action.
- Can use trust fund, surety bond, letter of credit, or self-insurance

References

Minnesota Regulations: Chapter 3035, sections 0300, 2555, 2625, 2635, 2645, 2655, 2695, 2815, 2885, and 2910

Jim Chiles, Solid Waste Division, Minnesota Pollution Control Agency (personal communication, 10/23/01)

Arlo Knoll, Mineland Reclamation, Lands and Minerals Division, Minnesota Department of Natural Resources (personal communication, 10/22/01)

MISSOURI: Coal Mines

The Missouri Department of Natural Resources (DNR) Land Reclamation Program (LRP) regulates placement of CCW in coal and noncoal mines only when the Solid Waste Management Program (SWMP) grants a beneficial use/reclamation exemption (see below). In such a case, the State mining regulations, which are substantively similar to the Federal SMCRA regulations, apply and a major revision of the coal mining and reclamation permit would be required (there are separate applicable noncoal regulations). In amending the permit to account for CCW placement, the LRP addresses the following:

- Reclamation plan,
- State approval process,
- Ground-water monitoring (both during and after placement), and
- Closure requirements.

Under DNR's Solid Waste Management Program, a beneficial use/reclamation exemption from having to obtain a solid waste permit may be granted for certain uses of CCW. A beneficial use exemption would be granted only after consultations with other interested programs within DNR, including LRP. For CCW mine uses with a beneficial use exemption, the solid waste regulations impose requirements in the following areas:

- Site characterization,
- Reclamation plan,
- Waste characterization (both pre-placement and during placement),
- State approval process, and
- Operational requirements/placement engineering

In addition to the beneficial use exemption described here, there is also a provision exempting from solid waste permitting requirements fly ash produced by coal combustion in certain counties "if such ash is constructively reused or disposed of by a grout technique in any active or inactive noncoal, non-open-pit mining operation located in a city having a population of at least three hundred fifty thousand located in more than one county and is also located in a county of the first class without a charter form of government with a population of greater than one hundred fifty thousand and less than one hundred sixty thousand, provided said ash is not considered hazardous waste under the Missouri hazardous waste law." (RSMo 16-260.242).

If a beneficial use exemption is not granted, a solid waste disposal permit would be required for mine placement activity. Missouri's solid waste permit requirements are summarized in *Regulation of Landfills and Surface Impoundments Managing Coal Combustion Waste in 26 States*, December 14, 2000. Because details regarding the applicability of these requirements to mine placement projects have not yet be tested through implementation, the requirements are not summarized here.

References

Missouri Statutes: RSMo 16-260.242; RSMo Chapters 444.800 - 444.970

Missouri Regulations: 10 CSR 80-2.020(9); 10 CSR 40 *et seq.*

US EPA OSMRE COALEX Report 245

Brian Hicks, Land Reclamation Program, Missouri Department of Natural Resources (personal communication, 4/27/01 and 7/2/01, and written comments to EPA, 2/14/02)

Scott Waltrip, Solid Waste Program, Missouri Department of Natural Resources (personal communication, 6/11/01)

Scott Waltrip, Solid Waste Program, Missouri Department of Natural Resources and Brian Hicks, Land Reclamation Program, Missouri Department of Natural Resources. Presentation at IMCC Intergovernmental Forum on Mine Placement of Coal Combustion Wastes. May 15-16, 2001. St. Louis, Missouri.

MISSOURI	
Regulatory Agency Oversight	Missouri Department of Natural Resources (DNR): • Land Reclamation Program (LRP) • Solid Waste Management Program (SWMP)
Allowed Uses	Beneficial uses as authorized by the SWMP as part of mine reclamation.
Before Placement	
Distinction Between Beneficial Use and Disposal	The use CCW on a mine site is considered beneficial use provided beneficial use and/or reclamation can be demonstrated and provided that pollution, a public nuisance, or a health hazard will not be created.
Site Characterization	*Substantively similar to federal SMCRA, plus:* • Analysis of the physical and chemical characteristics of water quality and background soils is required. • Verification by certified hydrogeologist that placement is above the water table.
Siting Restrictions	*Substantively similar to federal SMCRA, plus:* CCW must be placed above the seasonal high ground-water table unless a variance is obtained.
Reclamation Plan	*Substantively similar to federal SMCRA, plus:* • Explanation of the beneficial use or reclamation. • Documentation identifying the site location, surrounding land use, and site characteristics. • An estimate of the quantity of CCW to be disposed and the time required for disposal procedures. • Management plan. • Contingency plan. • CCW handling plan – in part addressing where the materials will be placed in relation to the expected water table in the backfilled spoil.
Waste Characterization	If placement is covered by an engineered clay cap, the only characterization requirement is to show the CCW is non-hazardous using TCLP. If there is any potential for ground-water contact or no cap, ASTM characterization is required.
Waste Characteristic Limits	
Address Acid-Base Balance/Acid Mine Drainage	*Substantively similar to federal SMCRA, no additional requirements.*
State Approval Required to Proceed	*Substantively similar to federal SMCRA, plus:* A request for a beneficial use/reclamation exemption must be approved by SWMP, and a major revision of the mining and reclamation permit must be obtained.

MISSOURI	
Public Participation	*Substantively similar to federal SMCRA, no additional requirements.*
During Placement	
Ongoing Waste Characterization	Quarterly TCLP test of each CCW source (and TCLP test run whenever power plant changes fuel source or other conditions that may affect the quality of CCW).
Ground-water Monitoring	*Substantively similar to federal SMCRA, plus:* Annual ground-water monitoring for 16 parameters.
Performance Standards	*Substantively similar to federal SMCRA, no additional requirements.*
Enforceable Limits	*Substantively similar to federal SMCRA, no additional requirements.*
Corrective Action	*Substantively similar to federal SMCRA, no additional requirements.*
Operational Requirements/ Placement Engineering	*Substantively similar to federal SMCRA, plus:* • Must include a description of the proposed operational procedures for waste disposal (including compaction, dust control, and erosion control) and procedures for any complications that may arise. • CCW must be placed above the seasonal high ground-water table unless a variance is obtained.
Closure/Post Closure Care	
Ongoing Ground-water Monitoring	*Substantively similar to federal SMCRA, plus:* Ongoing ground-water monitoring may be required if deemed necessary.
Performance Bonding or Financial Assurance	*Substantively similar to federal SMCRA, no additional requirements.*
Other Closure/Post-closure Requirements	*Substantively similar to federal SMCRA, no additional requirements.*

MISSOURI: Noncoal Mines

As with coal mines, the Missouri Department of Natural Resources Land Reclamation Program (LRP) regulates placement of CCW in noncoal mines only when the Solid Waste Management Program (SWMP) grants a beneficial use/reclamation exemption. The placement of CCW on a mine site is considered beneficial use provided beneficial use and/or reclamation can be demonstrated and provided that pollution, a public nuisance, or a health hazard will not be created.

In the case of beneficial use of CCW, the State noncoal mine regulations apply and a major revision of the mining and reclamation permit would be required. The noncoal mine regulations are similar to the Federal SMCRA regulations for coal mines, except there is no site characterization or water monitoring. In addition, the LRP cannot require testing for CCW solutes at noncoal mine operations. The factors addressed by the LRP in amending the noncoal mine permit to account for CCW placement are detailed in the Missouri summary profile for coal mines, found above. The summary profile for coal mines, therefore, also describes the SWMP's beneficial use requirements as they pertain to CCW placement in noncoal mines.

Where a beneficial use exemption is not granted, a solid waste disposal permit is required and the SWMP has sole jurisdiction over the activity. The report entitled *Regulation of Landfills and Surface Impoundments Managing Coal Combustion Waste in 26 States* details the solid waste disposal requirements for CCW mine placement

References

Missouri Statutes: RSMo 16-260.242

Missouri Regulations: 10 CSR 40-10 *et seq*.; 10 CSR 80-2.020(9)

Brian Hicks, Land Reclamation Program, Missouri Department of Natural Resources (personal communication, 4/27/01 and 7/2/01)

Scott Waltrip, Solid Waste Program, Missouri Department of Natural Resources (personal communication, 6/11/01)

Scott Waltrip, Solid Waste Program, Missouri Department of Natural Resources and Brian Hicks, Land Reclamation Program, Missouri Department of Natural Resources. Presentation at IMCC Intergovernmental Forum on Mine Placement of Coal Combustion Wastes. May 15-16, 2001. St. Louis, Missouri.

MONTANA: Coal Mines

Montana's Department of Environmental Quality, Industrial and Energy Minerals Bureau has sole jurisdiction over the disposal of CCW in permitted mines. Montana has developed specific mining regulations that apply to the use of CCW as fill material or for disposal in permitted strip or underground mines. These regulations, require that the mine operator obtain approval for the CCW activity as part of the mining permit and address the following:

- Site characterization,
- Reclamation plan,
- Performance standards,
- Waste characterization
- Waste characteristic limits,
- State approval process,
- Ground-water monitoring (both during and after placement),
- Enforceable limits,
- Operational requirements/placement engineering,
- Financial assurance, and
- Closure requirements.

Montana's solid waste regulations include CCW in the definition of an industrial solid waste. However, a solid waste disposal permit is not required for CCW mine placement if the mine is permitted by the Industrial and Energy Minerals Bureau.

References

Montana Statutes: MCA 82-4 *et seq.*

Montana Regulations: ARM 17.24.510; ARM 17.24

Neil Harrington, Industrial and Energy Minerals Bureau, Coal and Uranium Program (personal communication, 4/23/01 and 6/28/01)
Rick Thompson, Community Services Bureau, Waste Management Section (personal communication, 4/24/01)

MONTANA	
Regulatory Agency Oversight	Montana Department of Environmental Quality, Industrial and Energy Minerals Bureau
Allowed Uses	Fill material or disposal in strip or underground mines.
Before Placement	
Distinction Between Beneficial Use and Disposal	None specified.
Site Characterization	*Substantively similar to federal SMCRA, no additional requirements.*
Siting Restrictions	*Substantively similar to federal SMCRA, no additional requirements.*
Reclamation Plan	*Substantively similar to federal SMCRA, plus:* Must specify disposal procedures, the hydrological means, and the chemical and physical analyses that will be conducted to demonstrate that will not adversely affect water quality, public health or safety, or other environmental resources, and will not cause instability in the backfilled area.
Waste Characterization	Chemical and physical analyses as necessary to support demonstration above.
Waste Characteristic Limits	The CCW cannot exceed hazardous waste characteristic limits.
Address Acid-Base Balance/Acid Mine Drainage	*Substantively similar to federal SMCRA, no additional requirements.*
State Approval Required to Proceed	Prior approval from IEMB is required as a component of the mining permit. The relative significance of the proposal would dictate whether a minor or a major modification of the permit would be necessary. A major revision is any change in the mining or reclamation plan that: (1) results in a significant change in the postmining drainage plan; (2) results in a change in the postmining land use; (3) results in a significant change in the bonding level within the permitted area; or (4) results in a change that may affect the reclaimability of the area or the hydrologic balance on or off of the permitted area.
Public Participation	*Substantively similar to federal SMCRA, no additional requirements.*

MONTANA	
During Placement	
Ongoing Waste Characterization	Not required *(as per federal SMCRA)*
Ground-water Monitoring	*Substantively similar to federal SMCRA, plus:* • Ground-water levels, infiltration rates, subsurface flow and storage characteristics, and the quality of ground water must be monitored, and in a manner approved by IEMB. • Must include the measurement of the quality and quality of water in all disturbed or potentially affected geologic strata within and adjacent to the permit area. • IEMB may require an expansion of the ground-water monitoring system whenever a significant impact is likely. • Results must be reported semiannually and data kept current at the mine office for inspection.
Performance Standards	*Substantively similar to federal SMCRA, no additional requirements.*
Enforceable Limits	*Substantively similar to federal SMCRA, no additional requirements.*
Corrective Action	*Substantively similar to federal SMCRA, no additional requirements.*
Operational Requirements/ Placement Engineering	*Substantively similar to federal SMCRA, plus:* • Must conduct operations so as to minimize water pollution and, where necessary, use treatment methods to control water pollution, for example: divert runoff, use temporary vegetation, line drainage channels with rock or vegetation, or use mulching. • Backfilled materials must be placed to minimize adverse effects on ground-water flow and quality, to minimize off-site effects, and to support approved post-mining land use. • Compaction, contamination, and degradation of stockpiles must be minimized and the biological properties of the soil maintained.
Closure/Post Closure Care	
Ongoing Ground-water Monitoring	*Substantively similar to federal SMCRA, plus:* Expanded ground-water monitoring, if required, must continue until bond release.
Performance Bonding or Financial Assurance	*Substantively similar to federal SMCRA, no additional requirements.*
Other Closure/Post-closure Requirements	*Substantively similar to federal SMCRA, no additional requirements.*

MONTANA: Noncoal Mines

In Montana, CCW disposal is currently taking place at one limestone mine. Unlike coal mines, the placement of CCW in a noncoal mine falls under the shared jurisdiction of the mining programs and solid waste program.

Under the mining program, regulation of noncoal mines is divided into two mining programs: Opencut (includes sand, gravel, bentonite, clay, scoria, soil materials, and peat) and Hard Rock (includes all other non-opencut minerals[5]). Each mining program requires a permit mandating a reclamation plan. The reclamation plan would need to address any CCW placement taking place on the mine site but the regulations do not include any special conditions. According to internal policy, the focus of a decision to allow CCW placement would be on protection of hydrologic resources, the reclaimed vegetation, and the post-mining land use. The main elements of these noncoal mine programs are described below.

In addition to mining permit coverage, CCW placement requires coverage under a solid waste disposal permit. The applicable elements of the solid waste program are also included below, assuming the classification of CCW as Waste Group II and the classification of the noncoal mine as a Class II landfill. Montana has three solid waste groups (none include hazardous wastes): Group II wastes include decomposable wastes and mixed solid wastes (e.g., municipal and household solid wastes, commercial and industrial solid wastes such as ashes); Group III wastes include wood wastes and non-water soluble solids (e.g., dirt, rock, brush, industrial mineral wastes); and Group IV wastes include construction and demolition wastes and asphalt. The disposal facilities are similarly classified with a Class II landfill being able to accept Group II, Group III, and Group IV wastes. Class III landfills may accept only Group III wastes, but Class IV landfills may accept both Group III and Group IV wastes.

The Opencut mining regulations require the following:

Site Information

- A map identifying areas to be disturbed, topographic features, boundaries of proposed reclamation, waterways and wells, future locations of stockpiles and disposal sites
- Narrative of the pre-existing condition, including land use, estimated depth of water table, description of surface water features or wells, dominant vegetation, and any significant use by wildlife
- May require a standard soil survey of the proposed mine site

[5] except uranium which must met the same requirements as coal.

Mining and Reclamation Plan

- Designation of a postmining land use that is in conformance with local zoning
- Description of structures to control flooding, sedimentation, or erosion
- Appropriate measures to protect surface water and ground water from deterioration of water quality or quantity from mining and reclamation activities. Data may be required regarding water quality and quality before, during, and after mining.
- Description of post-mining topography and the methods that will be used to achieve contours. Surfaces must be at least 3 feet above the seasonal water table.
- A disposal plan that requires a cap of at least 3 feet of suitable plant growth material, disposal in accordance to solid waste rules, and placement in an area where it could not be encountered by future mining operations. The disposal of waste not generated on site must be approved by the State.
- A revegetation plan, if the postmining land use requires it
- A statement that reclamation will be completed within 1 calendar year after mining operations have ceased

Financial Assurance

- For operations and reclamation (at least $200/acre of disturbed land)

The Hard Rock mining regulations require the following:

- Notice and comment on the new permit and major amendments

Reclamation Plan

- The mining area must be reclaimed for one or more uses specified in the regulations. The areas does not need to be reclaimed to a better condition or a different use than pre-existing.
- Describe proposed topography of reclaimed land
- Establish vegetative cover commensurate with the proposed post-mining land use
- Provisions for construction of devices to control water drainage if there is a need to prevent acid drainage or sedimentation
- Must comply with all applicable laws regarding solid waste disposal. All refuse must be disposed of in a manner that will prevent water pollution or deleterious effects upon the revegetation efforts.
- All final grading must be made with non-noxious, nonflammable, noncombustable solids unless approval has been granted for a supervised sanitary fill
- Install controls to reduce or prevent siltation, erosion or other water pollution damage to streams and natural water courses

- Dust and airborne detritus controls
- Reclamation must be concurrent with mining operations and completed within a specified reasonable amount of time
- Inspections at least once per year

Financial Assurance
- Amount determined by the State

The solid waste landfill regulations require the following:

Location Restrictions
- Not within a 100 year floodplain
- Only in areas which will prevent the pollution of ground and surface waters and public and private water supply systems
- Not where geological formations contain rock fractures or fissures which may lead to pollution of the ground water
- Must be located to allow reclamation and reuse of the land
- Not within wetlands
- Not within 200 feet of a fault
- Not within seismic impact zones or unstable areas

Design Requirements
- Drainage structures must be installed
- Adequate separation of waste from underlying or adjacent water must be provided, the extent of which to be decided on a case-by-case basis
- Designed to ensure that concentration values for parameters will not be exceeded in the uppermost aquifer
- Composite liner (30-mil flexible membrane liner and 2 foot layer of compact soil, with hydraulic conductivity no more than $1x10^{-7}$ cm/sec)
- Leachate collection system
- Must be designed, constructed, and operated in a manner to prevent harm to human health and the environment

Operation and Maintenance Plan
- Reclamation plan
- Ground-water monitoring plan
- Disposal areas must be controlled by supervision, fencing, signs or similar means as approved

- Daily compaction and cover (6 inches)

Closure
- Final cover with minimum of 18 inches earthen material
- Seed bed layer with a minimum of 5 inches of earthen material
- Revegetation of final cover within 1 year

Post-closure
- Period of 30 years
- Continue ground-water monitoring
- Post-closure land uses must not disturb the integrity of the final cover, liners, or the function of the monitoring systems
- Financial assurance for operations, closure, and post-closure care

References

Montana Regulations: ARM 17.50.501-540; ARM 17.24.201-215; ARM 17.24.101, 115-146

Neil Harrington, Coal and Uranium Program, Industrial and Energy Minerals Bureau (personal communication, 10/22/01)

Warren McCullough, Chief, Environmental Management Bureau (personal communication, 10/23/01)

Ricknold Thompson, Waste Management Section Supervisor, Community Services Bureau (personal communication, 11/2/01)

NEBRASKA: Noncoal Mines

In Nebraska, CCW placement in a noncoal mine has yet to occur, although the State has recently responded to a proposal to allow CCW in a limestone quarry. If it were to occur, the Nebraska Department of Environmental Quality, Waste Management Section (NDEQ) would have oversight of the activity. DEP has issued policy regarding alternative uses of CCW which allows for use as structural fill and provides an evaluation process for non-specified uses, such as disposal. The policy outlines the following criteria to be used by DEP to review utilization requests on a case-by-case basis:

- Is the material classified as hazardous waste or held to other regulatory standards?
- Is the materials contaminated with other wastes?
- Does the material pose a potential threat to human health or the environment?
- Does the end use of the material constitute disposal?

Regarding the last question, the policy states "For those materials in which it has been demonstrated that the constituents of concern are below established MCLs, maximum contaminant level goals or other recognized published data, the Department will then evaluate the acceptability of the proposed use of the material in light of those applications in which the ultimate end use may constitute disposal."

According to Morgan Leibrandt, NDEQ, the review of a proposal for CCW mine placement would likely include an assessment of the fate of the CCW once in place and its geotechnical properties, which would require an analysis of the CCW and an engineering study of its suitability as a fill material.

References

NDEQ Policy WAS005: Alternative Use of Coal Combustion By-Products. October 1995 (revised July 18, 1997).

Morgan Leibrandt, Compliance Unit Supervisor, Waste Management Section, Nebraska Department of Environmental Quality (personal communication, 10/22/01)

NEW MEXICO: Coal Mines

In New Mexico, CCWs are not defined as a solid waste and are exempt from all solid waste regulations. Therefore, the New Mexico Department of Energy, Minerals, and Natural Resources, Division of Mining and Materials (DMNR) has sole jurisdiction over the placement of CCW in mines. DMNR issues a modified mining and reclamation permit for CCW placement under State regulations that are substantively similar to the federal SMCRA regulations. In addition, the State has internal policy that applies additional requirements to mine placement projects in the following areas:

- Site characterization,
- Siting restrictions,
- Reclamation plan,
- Waste characterization,
- State approval process,
- Operational requirements/placement engineering,
- Ongoing ground-water monitoring, and
- Closure requirements.

The guidelines regarding the placement of CCW in mines are not found in the State statutes, regulations, or written policy, but rather are at the discretion of the State as deemed appropriate on a site-by-site basis. The requirements explained in the table are those deemed necessary for the two CCW mine placement site currently operating in New Mexico.

References

New Mexico Regulations: 19 NMAC 8.2

Anderson, Monte. *New Mexico's Regulatory Requirements for the Use of Coal Combustion By-Products*. 1996 Coal Combustion By-Products Forum.

Monte Anderson, New Mexico Department of Energy, Minerals, and Natural Resources, Division of Mining and Materials (personal communication, 6/11/01)

NEW MEXICO	
Regulatory Agency Oversight	New Mexico Department of Energy, Minerals, and Natural Resources, Division of Mining and Materials
Allowed Uses	Placement in permitted mines.
Before Placement	
Distinction Between Beneficial Use and Disposal	None specified.
Site Characterization	*Substantively similar to federal SMCRA, plus:* Sample water quality of coal seam aquifer.
Siting Restrictions	*Substantively similar to federal SMCRA, no additional requirements.*
Reclamation Plan	*Substantively similar to federal SMCRA, plus:* • CCW disposal plan is incorporated into mining reclamation plan. • Must include a map of the disposal area.
Waste Characterization	Conduct leachate studies of CCW, as well as compaction and permeability tests.
Waste Characteristic Limits	None specified *(as per federal SMCRA)*.
Address Acid-Base Balance/Acid Mine Drainage	*Substantively similar to federal SMCRA, no additional requirements.*
State Approval Required to Proceed	Upon approval, the CCW disposal plan is incorporated into the mining permit (is not considered a permit modification).
Public Participation	Not required.
During Placement	
Ongoing Waste Characterization	Not required *(as per federal SMCRA)*.
Ground-water Monitoring	*Substantively similar to federal SMCRA, plus:* Quarterly monitoring of the chemical parameters that make up the CCW.
Performance Standards	*Substantively similar to federal SMCRA, no additional requirements.*

NEW MEXICO	
Enforceable Limits	*Substantively similar to federal SMCRA, no additional requirements.*
Corrective Action	*Substantively similar to federal SMCRA, no additional requirements.*
Operational Requirements/ Placement Engineering	*Substantively similar to federal SMCRA, plus:* Drainages that run above disposal areas should have low drainage gradients.
Closure/Post Closure Care	
Ongoing Ground-water Monitoring	*Substantively similar to federal SMCRA, plus:* Following reclamation, lysimeters may be required to monitor any saturation.
Performance Bonding or Financial Assurance	*Substantively similar to federal SMCRA, no additional requirements.*
Other Closure/Post-closure Requirements	*Substantively similar to federal SMCRA, plus:* Disposal areas are to be covered by spoil materials in addition to topsoil material.

NEW YORK: Noncoal Mines

In New York, mine placement of CCW is regulated jointly by two divisions within the New York Department of Environmental Conservation, the Division of Solid Waste and the Division of Mineral Resources. Mine placement of CCW currently is occurring at only one mine site, an old sand and gravel quarry (New York does not have any coal mines), and involves fly ash exclusively. The site is operating under an RD&D permit from the Division of Solid Waste and a mining permit from the Division of Mineral Resources. New York anticipates that any future projects would be required to also obtain permits from both divisions. From the Division of Mineral Resources, a mining permit amendment would be necessary if CCW placement was not part of the original reclamation plan. The Division of Solid Waste may issue a beneficial use permit. Beneficial use permit requirements have been established for certain CCW uses,[6] but mine placement is not one of these, so approval of this use would be on a case-by-case basis.

The requirements/policies for mine placement of CCW are determined on a case-by-case basis and are site-specific in the solid waste and mining permits. The general mine placement requirements and those for the current project are outlined below.

Site characterization

- Site characterization is required as a part of the original mining permit and must include the geographic location of the mine; the location and description of topographic, cultural, and land-use features within and adjacent to the affected land; and a description of the existing condition of the ground surface at the mine including areas already mined or disturbed by mining activity.
- Consideration of the site hydrology is also required as part of the original mining permit and, on a case-by-case basis, may have to specifically address the use of CCW.
- The need for background ground-water and surface water monitoring data is determined on a case-by-case basis.

Siting restrictions

- The criteria for accepting/rejecting a site are determined on a case-by-case basis.

Reclamation plan

- A reclamation plan is required as part of the original mining permit application and must address the CCW placement.

---

[6] These include: in the manufacture of roofing shingles or asphalt products; as a traction agent on roadways, parking lots and other driving surfaces; as an ingredient to produce light weight block, light weight aggregate, low strength backfill material, manufactured gypsum or manufactured calcium chloride; as a cement or aggregate substitute in concrete or concrete products; as raw feed in the manufacture of cement; and as structural fill within building foundations when placed above the seasonal high groundwater table.

- The reclamation plan must include the applicant's proposed land-use objective, the proposed method of reclaiming affected land, and a schedule for reclaiming the affected land.
- The site must meet grade requirements and compressive strength requirements.

Waste characterization & limits

- Waste characterization must be conducted both pre-placement and during placement on a quarterly basis using the SPLP and total metals methods. The State has not assigned numerical acceptance criteria for the single existing site. However, the facility itself has established internal criteria.

Ground-water and surface water monitoring

- Groundwater and surface water monitoring is required during placement for metals and routine field parameters. The number of wells and frequency of monitoring are determined on a case-by-case basis. For CCW placement, ground water sampling wells must be located down-gradient and in proximity to the disturbed area.
- The New York State ground-water and surface water quality standards must be met (specified at 6 NYCRR 703)
- Groundwater and surface water monitoring after placement is determined on a case-by-case basis, although generally ash landfills are required to submit at least five years of post-closure monitoring data.
- Groundwater and surface water monitoring can be discontinued once the post-closure requirements are met.

Operational requirements/placement engineering

- Placement into the water table is not allowed under current beneficial use determinations. For RD&D permits, placement would be determined on a case-by-case basis.
- Placement into mine pools is allowed.
- Liners are not currently required.
- Leachate collection systems are not required.
- Waste conditioning is required using moisture addition.
- Fugitive dust controls are required.

Closure and post-closure requirements

- Closure and post-closure plans addressing the CCW placement are required for current site.
- Closure requirements are determined on a case-by-case basis. The requirements for the current site include: final closure and capping of this project must occur within 90 days of the earliest of the dates listed within the permit, except that a vegetative cover must be established within 180 days; and capping shall consist of 18 inches of compacted soils overlain by 6 inches of topsoil,

graded to a minimum slope of 2%, followed by the establishment of an appropriate cover crop. This cap shall be monitored and maintained for a minimum of 30 years following closure.
- Re-establishment of the surface stream is required.

Corrective Action
- Corrective actions may be triggered by violation of the permit. Generally, the State may require closure, capping, or possible removal of placed materials. For the existing site, the State may require immediate cessation of operations.

Financial Assurance
- Financial assurance is required. Mechanisms include liability insurance, bonds, letters of credit, certificates of deposit, and cash.
- For the reclamation bond, the period of liability extends until final reclamation is completed. For the RD&D permit, the bond is renewed as the permit is renewed.
- The amount is determined on a case-by-case basis.
- Closure certification is required for bond release (minimum of two years after reclamation before bond release).

References

New York Regulations: 6 NYCRR 360-1.15(b)(14-16); 6 NYCRR 703

Draft Final Report on Mine Placement Information Collection Visit to New York. October 2, 2002. U.S. Environmental Protection Agency.

NORTH DAKOTA: Coal Mines

The North Dakota Pubic Service Commission, Reclamation Division (PSC) has dual jurisdiction with the North Dakota Department of Health, Division of Solid Waste Management (DOH) over placement of CCW in mines. Such activity is subject to State mining regulations, which are substantively similar to the federal SMCRA regulations, and additional PSC policy. PCS's policy speaks to the performance bond and closure process in instances where mines are being used as a disposal facility. PSC also has developed policy addressing the beneficial use of CCW.

Mines used for CCW disposal also are regulated by DOH and are permitted as special waste landfills. The solid waste management permit is reviewed by PSC before final issuance. The regulatory provisions and DOH policy provisions for mines regulated as special waste landfills include:

- Site characterization,
- Siting restrictions,
- Reclamation plan,
- Performance standards,
- Waste characterization (both pre-placement and during placement),
- State approval process,
- Ground-water monitoring (both during and after placement),
- Operational requirements/placement engineering, surface water controls
- Comply with water protection provisions,
- Financial assurance,
- Closure requirements and post-closure care, and
- Corrective action.

Beneficial use on mine sites is allowed in generally relatively small amounts. The activity must follow specific guidelines and be approved by DOH. Additional requirements or conditions beyond the guidelines may be stipulated by DOH.

References

North Dakota Statutes: NDCC 38-14.1

North Dakota Regulations: NDAC 33-20-04, 33-20-07, 33-20-13, 33-20-14, and 69-05.2.

Policy Memorandum No. 15 to Mine Operators: Performance Bond Release for Waste Disposal Operations Located on Mined Lands. January 13, 1999.

Guideline 11– Ash Utilization for Soil Stabilization, Filler Materials and Other Engineering Uses. April 2002.

Jim Deutsch, Director, Reclamation Division, North Dakota Pubic Service Commission (personal communication, 5/8/01)

Steve Tillotson, Asst. Director, Division of Solid Waste Management, North Dakota Department of Health (personal communication, 5/8/01 and 6/18/01)

Draft Final Report on Mine Placement Information Collection Visit to North Dakota. December 11, 2002. U.S. Environmental Protection Agency.

Steve Tillotson, Asst. Director, Division of Solid Waste Management, North Dakota Department of Health (written comments to EPA, 11/13/02)

Jim Deutsch and Bill Dodd, North Dakota Pubic Service Commission (written comments to EPA, 11/02)

NORTH DAKOTA		
	Disposal	**Beneficial Use**
Regulatory Agency Oversight	• North Dakota Pubic Service Commission, Reclamation Division (PSC) • North Dakota Department of Health, Division of Solid Waste Management (DOH)	
Allowed Uses	Disposal at inactive mine sites	• Soil stabilization • Road stabilization • Filler material • Other engineering uses as approved on a case-by-case basis
Before Placement		
Distinction Between Beneficial Use and Disposal	Landfilling of CCW with no intended beneficial use.	Any CCW placement not considered disposal that can be demonstrated to not adversely impact the environment.
Site Characterization	The site characterization must address the following: • Location and water quality of the waterbodies and wells within one mile of the site boundary. • Site location in relation to the 100-year floodplain.	The site characterization must address soils, topography, geology, hydrogeology, ground-water quality, surface water conditions and flow, vegetation, etc.
Siting Restrictions	• Not within an area which may result in impacts to human health or environmental resources. • Not within an aquifer or wellhead protection area. • Not within 1,000 feet to a downgradient drinking water supply well (may be waived). • Not within 100-year floodplain. • Not where geologic or manmade features may result in differential settlement • Not within unstable slopes. • Not within woody draws. • Not within mine high walls. • Not within endangered or threatened species habitats. • Not within 200 feet horizontally from the ordinary high water elevation of any surface water or wetland (may be waived). • Placement into the water table is not allowed.	No specific restrictions but information must be submitted in the proposal regarding "potential receptors," such as: • Nearby communities • Residences • Parks • Natural areas • Waterways

NORTH DAKOTA		
	Disposal	**Beneficial Use**
Reclamation Plan	Required under DOH Solid Waste Requirements. Also, reclamation plans in the State SMCRA permit must be revised to change the post-mining land use and provide details for the waste disposal activity. This revision is considered a major revision subject to notice requirements. Also, a site closure and reclamation plan must be included for the waste disposal permit issued by DOH.	Case-by-case under DOH solid waste guidelines. However, plans must be discussed in the State SMCRA permit.
Waste Characterization	Waste characterization is required using USEPA's physical and chemical test methods for evaluating solid waste (including TCLP analysis). The regulations do not have specific requirements for waste characterization, rather the necessary testing is determined on a case-by-case basis. DOH's preferred test is the ASTM D-3987 test which mimics rainfall interaction with the waste.	Waste characterization is required using either: (1) a modified US EPA SPLP Method 1312 with a solution to solid ratio of 4:1, or (2) a modified ASTM D-3987 procedure with the same ratio. The guidelines provide a list of parameters that may be reduced based upon review. The proposal should also provide: • Background information on the source, quality, and quantity of the ash. • Laboratory simulation testing to replicate field conditions to determine leachability of the material as-placed.
Waste Characteristic Limits	None specified.	None specified *(as per federal SMCRA)*.
Address Acid-Base Balance/Acid Mine Drainage	Not required.	Not required.
State Approval Required to Proceed	Must obtain a solid waste disposal permit from DOH and obtain specific PSC approval for CCW placement.	Approval by any health, environmental, and permitting authorities must be obtained before the project is conducted. Any DOH approval is contingent upon and does not supercede compliance with all local environmental, health, and building code requirements. Plans to beneficially use CCW in mine areas also must be added to the State SMCRA permit.

NORTH DAKOTA		
	Disposal	**Beneficial Use**
Public Participation	• Public notice of proposed waste disposal permit: Two publications by permit applicant, and one by DOH. • 30 day public comment period. • Opportunity for a hearing if sufficient interest. • Public notice also is required for the revision to the State SMCRA permit to change the reclamation plan for CCW disposal.	None.
During Placement		
Ongoing Waste Characterization	Not required.	Required on a case-by-case basis for ongoing projects on an annual basis, and more frequently if: • There has been any process change in the waste generation that might influence the character of the waste • The raw material or type of fuel changes • There has been any other changes or variances that may influence the characteristics of the ash/product or mixture
Ground-water Monitoring	*Substantively similar to federal SMCRA, plus:* • Include at least one upgradient well and at least 2 downgradient wells. • A minimum of four independent samples from each well must be collected for analysis during the first sampling event for establishing background data. • Monitoring for several additional parameters required.	May be required on a case-by-case basis.
Performance Standards	Not specified (other than enforceable limits below).	Not specified.

NORTH DAKOTA		
	Disposal	**Beneficial Use**
Enforceable Limits	• If a statistically significant increase over background values or an exceedance of a maximum concentration limit or water quality standard, the operator must initiate an assessment of remedial measures. • Based on the results of the assessment, the operator must select a corrective action remedy within thirty days which is protective of human health and environmental resources and attains ground-water protection standards. • Must have adequate financial assurance to cover any corrective actions.	Not specified.
Corrective Action		The proposal should address reasonable contingencies such as discontinuance of the application methods and cleanup of the site should environmental damage occur.
Operational Requirements/ Placement Engineering	• An operation plan with procedures for managing the CCW. • A liner is required, but typically a leachate removal system is not. • Placement into the water table is not allowed. • Spread and compact waste as densely as possible. • Control run-on and runoff. • Fugitive dust controls. • Intermediate cover (8 inches of clay or synthetic material).	• The proposal should include a description of the material handling and conceptual construction, including: transport and storage of materials, placement of materials, equipment, construction techniques, moisture application and monitoring, mixing, testing, etc. • Controls and monitoring of windblown dust, stormwater and/or any ponded water must be described. • The proposer should provide routine reports on construction and operation progress, monitoring results, final construction details, and re-analysis of the ash.

NORTH DAKOTA		
	Disposal	**Beneficial Use**
	Closure/Post Closure Care	
Ongoing Ground-water Monitoring	• Must continue during post-closure period.	May be required on a case-by-case basis.
Performance Bonding or Financial Assurance	• Must have adequate financial assurance to cover costs of closure and post-closure care. The mechanisms may include a reserve account, trust fund, surety bond, letter of credit, financial test, insurance policy, or corporate guarantee. • Before granting final bond release on mined areas used for long-term waste disposal activities, the PSC will require a showing that sufficient topsoil and subsoil have been set aside to provide a total respread thickness of at least 24 inches of soil for sites where the cover material is non-sodic spoil and 36 inches where the cover is sodic spoil, with a minimum topsoil thickness of 8 inches.	Not required.
Other Closure/Post-closure Requirements	• Closure and post-closure plans required. • Closure within 30 days of final disposal activity. • A final cap with a depth of least 5 feet (compacted clay or synthetic material, and a layer for plant growth) that ensures the quality and integrity of the hydraulic barrier and the vegetative cover. • Post-closure maintenance and monitoring for 30 years. • Post-closure corrective action activities may be required. • Vegetative cover must be good enough to provide long-term site stability and the capability to produce hay crops.	The proposal should address final disposal of placed materials after the life of the project, if applicable.

NORTH DAKOTA: Noncoal Mines

According to Ed Murphy, North Dakota Geological Survey, gravel pits and clay pits for brick manufacture are the only types of noncoal mining currently occurring. There is no regulatory oversight of gravel and clay mining operations and reclamation by his agency at this time. Therefore, the North Dakota Department of Health, Division of Solid Waste Management (DOH) would have sole jurisdiction over the disposal of CCW in noncoal mines if it were to occur. As with coal mines, noncoal mines used for CCW disposal would be permitted by DOH as special waste landfills. The regulatory provisions and DOH policy provisions for mines regulated as special waste landfills are detailed in the North Dakota summary profile for coal mines, found above.

References

Steve Tillotson, Assistant Director, Division of Solid Waste Management, North Dakota Department of Health (personal communication, 10/31/01)

Ed Murphy, North Dakota Geological Survey (information provided via Steve Tillotson)

Draft Final Report on Mine Placement Information Collection Visit to North Dakota. December 11, 2002. U.S. Environmental Protection Agency.

OHIO: Coal Mines

Under State law as amended March 18, 1999, the Ohio Department of Natural Resources, Division of Mineral Resources Management (DMRM) has sole jurisdiction over the beneficial use of CCW on mine sites. No regulations have been developed pertaining to CCW beneficial uses, but DMRM has created policy guidelines, effective September 17, 2001, that detail the allowable beneficial uses and the controls on their use. The provisions of the policy guidelines include:

- Site characterization,
- Siting restrictions,
- Waste characterization (both pre-placement and during placement),
- Waste characteristic limits,
- Acid-base accounting,
- State approval process,
- Public participation,
- Ground-water monitoring, and
- Operational requirements/placement engineering,

These guidelines supplement existing State mining regulations, which are substantively similar to the federal SMCRA regulations, and apply the SMCRA provisions for noncoal mine waste disposal to CCW placement. The policy guidelines were developed for active coal mine sites and will be used only as a reference for abandoned mine lands projects.

Beneficial uses of CCW, as defined and controlled by DMRM, do not require a solid waste disposal permit. Mine placement that does not obtain DMRM's approval as a beneficial use would be categorized as disposal. There are no current mine placement operations that would be categorized as disposal. Historically, there may have been several disposal operations in the late 1980's, but these would have been managed under old guidelines and policy. Therefore, the discussion of disposal requirements in the paragraphs below and in the table is based on requirements that might apply, were disposal proposed today.

Disposal projects would be regulated jointly by DMRM and by the Ohio Environmental Protection Agency, Division of Solid and Infectious Waste Management (DSW). Under Ohio's solid waste regulations, fly ash and bottom ash that test as "non-toxic"[7] are

[7] Based on available characterization data and anecdotal information from DSW, most fly ash and bottom ash would meet this definition.

exempt from the definition of solid waste and from the solid waste permitting regulations. However, DSW has issued detailed policy guidelines regarding non-toxic CCW monofills. DSW has plans to convert the policy into enforceable law but the process has not yet begun. These policy guidelines require multi-media permitting and include:

- Site characterization (may be required on a site-by-site basis),
- Siting restrictions,
- Waste characterization (both pre-placement and during placement),
- Waste characteristic limits,
- State approval process,
- Ground-water monitoring (both during and after placement may be required on a site-by-site basis),
- Enforceable limits,
- Operational requirements/placement engineering, and
- Closure requirements.

DSW has additional, more stringent regulatory requirements for CCW that does not meet the definition of "non-toxic." These solid waste regulatory requirements are summarized in *Regulation of Landfills and Surface Impoundments Managing Coal Combustion Waste in 26 States*, December 14, 2000 and are not included in this summary.

References

Ohio Statutes: ORC 1513.02(A)(7); ORC 1513 and 1514; ORC 6111.01; ORC 3734.21; ORC 3734.01

Ohio Regulations: OAC 1501:13-9-09; OAC 1501:13; OAC 3745-30-01 through 04

Ohio DNR, Division of Natural Resources Management, GENERAL GUIDELINES, Beneficial Use of Coal Combustion By products (CCB) on Coal Mining and Reclamation ORC Chapter 1513 Permit Areas. (September 5, 2001)

Ohio DNR, Division of Natural Resources Management, HYDROLOGY GUIDELINES, Beneficial Use of Coal Combustion By products (CCB) on Coal Mining and Reclamation ORC Chapter 1513 Permit Areas. (September 5, 2001)

Ohio DNR, Division of Natural Resources Management, SOILS GUIDELINES. (September 5, 2001)

Ohio DNR, Division of Natural Resources Management, Attachment 34 [Beneficial Use of Coal Combustion Byproducts (CCB)]. (September 5, 2001)

Annette DeHavilland, Ohio Environmental Protection Agency, Division of Solid and Infectious Waste Management (personal communication, 6/13/01)

Mike Dillman, Ohio Department of Natural Resources, Division of Mineral Resources Management (personal communication, 5/4/01)

Bob Baker, Ohio Department of Natural Resources, Division of Mineral Resource Management. Presentation at IMCC Intergovernmental Forum on Mine Placement of Coal Combustion Wastes. May 15-16, 2001. St. Louis, Missouri.

Mike Sponsler, Chief, Ohio Department of Natural Resources, Division of Mineral Resources Management (written comments to EPA, 2/02)

Revised Draft Report on Mine Placement Information Collection Visit to Ohio. August 28, 2002. U.S. EPA Office of Solid Waste.

Bob Baker, Ohio Department of Natural Resources, Division of Mineral Resource Management (written comments to EPA, 11/19/02)

OHIO		
	Disposal	**Beneficial Use**
Regulatory Agency Oversight	Ohio Environmental Protection Agency, Division of Solid and Infectious Waste Management (DSW)	Ohio Department of Natural Resources, Division of Mineral Resources Management (DMRM)
Allowed Uses	Disposal at mine sites.	• Land reclamation uses (neutralization of coal refuse, neutralization of spoil, lining of pit floors for neutralization, reduce potential for acid mine drainage formation, sealing of toxic material). • Land application uses for agronomic value (soil additive). • Mine sealing.
Before Placement		
Distinction Between Beneficial Use and Disposal	Any placement not meeting the constraints at right is defined as disposal. (In practice, DMRM has used the volume of CCW to be placed to determine that a project constitutes disposal.)	• Use must not be in a manner that is equivalent to a disposal system or a solid waste disposal facility. • Use must be unlikely to adversely affect human health, human safety, or the environment. • Use must be unlikely to degrade existing land, air, or water quality.
Site Characterization	May be required on a site-by-site basis.	*Substantively similar to federal SMCRA, plus:* • Background water quality sampling under seasonal conditions is usually necessary in order to characterize existing conditions before CCW use begins. • The number of monitoring points needed to assess the potential impact on ground and surface water will be required. • For use as soil additive: The soil or spoil top cover must be sampled and analyzed before any CCB material can be added as a soil additive. This background analysis is needed to determine that the soil or spoil top cover is not contaminated.
Siting Restrictions	Ash may not be placed: • Within the surface or subsurface areas surrounding a	*Substantively similar to federal SMCRA, plus:* • Not within 100 feet of streams (unless variance

OHIO		
	Disposal	**Beneficial Use**
	public water well. • Above a federally declared aquifer. • In a sand or gravel pit. • In a limestone or sandstone quarry. • In an area of potential subsidence due to an underground mine. • Within 1000 feet of a water supply well or developed spring (some exceptions). • Within 5 feet of the uppermost aquifer (measured from the bottom of the liner).	approved). Distance may be increased for exceptionally high value streams. • Not within 100 feet of high-quality wetlands. Distance may be increased if necessary. • Not within 500 feet upgradient of a surface drinking water source or within 300 feet of a ground-water source. • Not within 300 feet of an occupied dwelling unless owner provides a written waiver. • Not within 8 feet of the regional ground-water table unless DMRM approves based on information that demonstrates ground-water contamination will not occur.
Reclamation Plan	Not required.	*Substantively similar to federal SMCRA, plus:* Operation and Reclamation Plan must include a detailed narrative description of the following: • Site preparation (include erosion and sediment controls); • Placement of CCB material and quantities used; • Placement of CCB material in relation to the regional ground-water table. In addition, maps and cross-sections are required.
Waste Characterization	• Representative samples of waste must be obtained and characterized using the TCLP acid extraction test or a modified TCLP extraction test. • Three initial test results for each parameter (21 total) are required to show compliance with the non-toxic criteria, where applicable. • An organic or dioxin analysis of the simulated leachate, or a chemical analysis of the dry material, may be required on a case-by-case basis.	• TCLP tests required prior to submittal for CCW and any associated material. • TCLP for arsenic, barium, cadmium, chromium, lead, mercury, selenium, pH, acidity, alkalinity, aluminum, chloride, sodium, iron, manganese, sulfate, TDS, fluoride, silver, zinc. The tests may use either acid or de-ionized water as the leachate solution. • Material characterization (total) for pH, percent pyritic sulfur, potential acidity, neutralization potential, hydrogen ion concentration, percent total sulfur, and

OHIO		
	Disposal	**Beneficial Use**
		calcium carbonate deficiency. • For use as soil additive: pH, boron, soluble salts, standard agricultural series test, primary drinking water standards, secondary drinking water analysis, and possible additional parameters. • For use as a liming agent: The calcium carbonate equivalent must be at least 100 parts per thousand (i.e., 100 tons of CaCO3 per 1,000 tons of ash) or 10% by dry weight. The calcium carbonate equivalence is to be determined by the Neutralization Potential Test in accordance with EPA-600/2-78/054 Section 3.2.3 or other test approved by the Division.
Waste Characteristic Limits	To be defined as non-toxic, TCLP levels may not exceed 30 times State MCLs for the RCRA toxicity metals other than silver. DSM has additional, more stringent regulatory requirements for CCWs that do not meet this definition.	• Maximum acceptable leachate concentrations are 30 times State MCLs for arsenic, barium, cadmium, chromium, lead, mercury, selenium. • For alkaline addition: pH between 6.5 and 12.5. • For low permeability use: pH between 6.5 and 12.5, hydraulic conductivity $1x10^{-7}$ cm/sec (with exceptions). • For use as soil additive: Boron less than 4 ppm (hot water extraction method), soluble salts(conductivity) less than 2 mmhos when mixed with the surface materials, and pH between 6.5 to 8.0 unless otherwise approved on a case-by-case basis.
Address Acid-Base Balance/Acid Mine Drainage	Not required.	*Substantively similar to federal SMCRA, plus:* Alkaline addition use requires complete acid/base accounting of the CCW and the associated material (spoil, coal refuse, etc.). Calcium carbonate deficiency must be more negative than -5 tons $CaCO_3$ per 1,000 tons of material. Modified acid/base analysis is required for other uses.
State Approval Required to Proceed	After a site inspection and consultations with the Ohio EPA district office personnel, a permit to install application,	Usually a major revision to a mining permit is proposed through an application to revise a permit. An updated

OHIO		
	Disposal	**Beneficial Use**
	detailed plans, an air permit to operate application, and an NPDES permit application need to be submitted.	probable hydrologic consequences and cumulative hydrologic impact assessment are required when coal ash is used on mine sites.
Public Participation	Not required.	*Substantively similar to federal SMCRA, plus:* • Proposals must include the consent of the owner of the land where CCW is to be placed. • If a major revision, must meet public notification/comment requirements of State law. • New permit applications are required to address CCW in the public notice.
	During Placement	
Ongoing Waste Characterization	At a minimum, annual tests must be performed on the materials and submitted. Additional analyses are required for any change in operations that generate waste.	Characterization required annually or when significant changes in CCW source or combustion/pollution control procedures. For use as soil additive: Required quarterly.
Ground-water Monitoring	May be required on a site-by-site basis.	*Substantively similar to federal SMCRA, plus:* • Monitoring, including surface water monitoring, is almost always required for additional parameters. • If required, monitoring is normally quarterly, but may be required at another frequency determined during the review process. • Monitoring points typically associated with active coal mines are, in most cases, capable of providing information on the effects of CCW placement. • Monitoring points can be existing wells, springs, seeps, mine discharges, streams, ponds, or other sites. • Upgradient and downgradient monitoring points will depend on the configuration of placement, volume of CCW, and existing conditions at the site.

OHIO		
	Disposal	**Beneficial Use**
Performance Standards	None specified.	*Substantively similar to federal SMCRA, plus:* The use of CCW shall be designed to: • Achieve an overall improvement in water quality, • Prevent or reduce the degradation of water quality, or • Have a benign impact on water quality. • For use as soil additive: Be applied at a rate/acre that will protect public health, safety, and the environment.
Enforceable Limits	If monitoring is required, can not exceed Ohio water quality standards and discharge limitations specified in the policy for 19 parameters.	*Substantively similar to federal SMCRA, no additional requirements.*
Corrective Action	Not required.	*Substantively similar to federal SMCRA, no additional requirements.*
Operational Requirements/ Placement Engineering	• Minimum of 5 feet between the uppermost aquifer and the bottom of the liner. • Recompacted soil liner must be at least 1.5 feet thick and have a maximum permeability of $1x10^{-7}$ cm/sec. • Leachate collection system required for entire disposal area. • A wastewater treatment facility to collect and treat all leachate and contaminated (contact) surface runoff from the disposal area must be constructed. • A diversion ditch must be placed around the perimeter of the disposal area. • A Storm Water Pollution Prevention Plan must be implemented. • Fugitive dust controls must be implemented. • A management plan that details the operation of the facility must be submitted.	*Substantively similar to federal SMCRA, plus:* • No placement within 8 feet of the regional ground-water table unless DMRM approves based on information that demonstrates ground-water contamination will not occur. • Cross-sections of the beneficial use placement configuration are required. At least one transverse cross-section and one longitudinal cross-section must be provided showing the elevation, final profile, saturated zones (existing and proposed) and reclaimed surface profiles of the beneficial use areas. • Compaction may be required on a case-by-case basis. • Erosion and sediment controls. • Dust control measures. • For alkaline addition use: The layers must not exceed a thickness of two feet. • For low-permeability use: To isolate acid and toxic materials, the layers must have a minimum thickness of two feet. • For use as soil additive: If CCW exceeds limits for soil

OHIO		
	Disposal	**Beneficial Use**
		additive use and is used in areas underlying surface growing media, it must be separated from the surface by a minimum of 30 inches of non-toxic material. • For use as soil additive: If CCW material is incorporated into acid-forming materials without a cap, the 4 foot non-toxic cover is required. • For use as soil additive: The depth of the CCW materials and soil mixture should not exceed one foot unless otherwise approved on a case-by-case basis. • For use as lime substitute: The calcium carbonate or other nutrient of the CCW material should be used in accordance with the amount based on chemical equivalence that would be needed to substitute for lime or other constituents.

OHIO		
	Disposal	**Beneficial Use**
Closure/Post Closure Care		
Ongoing Ground-water Monitoring	May be required on a site-by-site basis.	*Substantively similar to federal SMCRA, plus:* Monitoring for the additional parameters must continue until bond release.
Performance Bonding or Financial Assurance	Not required.	*Substantively similar to federal SMCRA, no additional requirements.*
Other Closure/Post-closure Requirements	• Final cap with thickness of at least 12-18 inches of material suitable for establishing and maintaining vegetative cover. • Final grading of 2-25%, grading must prevent ponding. • Final cover and reclamation should be completed within six months of final ash placement in the mine.	*Substantively similar to federal SMCRA, no additional requirements.*

OHIO: Noncoal Mines

In Ohio, the placement of CCW at a noncoal mine site has yet to occur. As with coal mines, the Ohio Department of Natural Resources, Division of Mineral Resources Management (DMRM) has sole jurisdiction over the beneficial use of CCW on noncoal mine sites. Beneficial uses include land reclamation uses (i.e., neutralization of coal refuse, neutralization of spoil, lining of pit floors for neutralization, reduce potential for acid mine drainage formation, sealing of toxic material), land application uses for agronomic value, and mine sealing. DMRM would require prior approval of the beneficial use and a revision of the reclamation plan to account for the use. No specific policy or regulations exist for beneficial uses at noncoal mine sites as they do for coal mine sites.

Mine placement that does not obtain DMRM's approval as a beneficial use would be regulated as disposal by the Ohio Environmental Protection Agency, Division of Solid and Infectious Waste Management (DSW). Under Ohio's solid waste regulations, fly ash and bottom ash that test as "non-toxic"[8] are exempt from the definition of solid waste and from the solid waste permitting regulations. However, DSW has issued detailed policy guidelines regarding non-toxic CCW monofills. DSW has plans to convert the policy into enforceable law but the process has not yet begun. These policy guidelines require multi-media permitting and are detailed in the Ohio summary profile for coal mines, found above. The Ohio Department of Natural Resources, Division of Mineral Resources Management (DMRM) would work the solid waste requirements into the reclamation plan but would not be involved in the disposal approval process.

Whether the CCW placement is considered disposal or a beneficial use, DMRM's noncoal mining regulations apply. The regulations require a 10-year mining and reclamation permit and direct the mine operator to do the following:

- Develop a reclamation plan, include a detailed map
- Perform site characterization/produce a geological data report
- Attain a performance bond: surety bond, cash, irrevocable letter of credit, or certificates of deposit (amount determined by DMRM and adjusted as necessary)
- Follow proper blasting procedures
- Minimize acid drainage and acid water accumulation

[8] Based on available characterization data and anecdotal information from DSW, most fly ash and bottom ash would meet this definition. DSW has more stringent regulatory requirements for CCW that does not meet the definition of "non-toxic." These requirements also are summarized in *Regulation of Landfills and Surface Impoundments Managing Coal Combustion Waste in 26 States*.

- Protect surface and subsurface water systems
- Comply with criteria for final slopes, highwalls, resoiling, soil amendments, and revegetation
- Comply with criteria on the construction of dams, dikes, diversions, impoundments, and drainage channels.

References

Ohio Administrative Code, Chapter 1501:14-1, 14-3, 14-4

Mike Dillman, Ohio Department of Natural Resources, Division of Mineral Resources Management (personal communication 10/19/01)

Revised Draft Report on Mine Placement Information Collection Visit to Ohio. August 28, 2002. U.S. EPA Office of Solid Waste.

OKLAHOMA: Coal Mines

In Oklahoma, there is currently no placement of CCW in active coal mines, although it is happening in several inactive coal mines where SMCRA regulations are not applicable. Placement in the inactive coal mines is governed by the State's noncoal mining regulations, described in the summary profile for noncoal mines, below. Oklahoma's solid waste regulations exempt CCW from all solid waste permitting requirements if disposed of in any active or inactive coal or noncoal mining operation that is permitted by the Department of Mines. Oklahoma recently proposed CCW disposal regulations applicable to mine placement. These proposed regulations have not yet been finalized.

If placement was to occur in an active coal mine, it would be under the sole jurisdiction of the Oklahoma Department of Mines (DOM) and be subject to State mining regulations, which are substantively identical to the Federal SMCRA regulations. Placement in coal mines, however, will most likely be limited in Oklahoma. According to Darrell Shults of the Oklahoma Department of Mines: "To date, it has not been a feasible alternative to dispose of coal combustion byproducts (CCB) in the active surface mining pits due to the fairly thin beds of coal present in Oklahoma. The required storage volume isn't available without severely impacting the final contours. Also, transportation from the CCB producer to the active coal mines is an economic impact."

References

Oklahoma Statutes: Title 45 O.S. § 940; Title 45 *et seq.*

Oklahoma Department of Environmental Quality, Coal Combustion Byproducts (CCB) Policy Statement. February 29, 2000.

Cathy Frank, Department of Mines (personal communication, 5/10/01)

Tom Gilbert, Department of Mines (personal communication, 5/2/01)

John Roberts, Department of Environmental Quality (personal communication, 4/10/01)

Darrell Shults, Oklahoma Department of Mines. Comments at IMCC Intergovernmental Forum on Mine Placement of Coal Combustion Wastes. May 15-16, 2001. St. Louis, Missouri.

Darrell Shults, Oklahoma Department of Mines (written comments to EPA, 11/21/01)

Draft Final Report on Mine Placement Information Collection Visit to Oklahoma. September 9, 2002. U.S. Environmental Protection Agency.

OKLAHOMA: Noncoal Mines

Oklahoma's solid waste regulations exempt CCW from all solid waste permitting requirements if disposed of in any active or inactive coal or noncoal mining operation that is permitted by the Oklahoma Department of Mines (DOM). Therefore, DOM has sole jurisdiction over CCW placement in noncoal mines and inactive coal mines. These types of placement are subject to the State noncoal mining regulations, summarized below. In 2001, DOM proposed specific CCW disposal regulations applicable to mine placement but they have yet to be finalized. The new regulations will be assimilated into existing applicable programs, rather than create a new program.

DOM's noncoal surface mining and reclamation permit regulations, including the proposed CCW disposal regulations, require the following:

- CCW disposal permit, including site-specific requirements, reclamation plan, and CCW-specific operations plan
- Public participation, including notice and comment, availability of monitoring data, and participation in inspections
- Waste characterization prior to and during placement
- Site characterization, including background ground-water and surface water monitoring
- Siting restrictions that include restrictions for proximity to the ground-water table, aquifer recharge areas, and flood prone areas
- Ground-water and surface water monitoring during placement
- Runoff controls
- Fugitive dust controls, that may include intermediate cover
- Final cover
- Revegetation
- Financial assurance

While post-closure site utilization is included in the reclamation plan, DOM has no post-closure jurisdiction.

References

Oklahoma Regulations: O.A.C. 460:10 *et seq*.

Doug Schooley, Administrator, Noncoal Program, Oklahoma Department of Mines (personal communication, 11/28/01)

Draft Final Report on Mine Placement Information Collection Visit to Oklahoma. September 9, 2002. U.S. Environmental Protection Agency.

PENNSYLVANIA: Coal Mines

Beneficial uses of CCW on mine sites (i.e., active and abandoned coal and noncoal mines) are under the control of both the Bureau of Mining and Reclamation (BMR) and the Bureau of Land Recycling and Waste Management (BLRWM). BMR has the authority for approval of beneficial uses in four categories: CCW placement, as an alkaline addition, as low permeability material, and as a soil additive or soil substitute. BMR's beneficial use regulations and guidelines for coal ash are incorporated into the mining permit and address the following:

- Site characterization,
- Siting restrictions,
- Reclamation plan,
- Performance standards,
- Waste characterization (both pre-placement and during placement),
- Waste characteristic limits,
- Acid-base balance/acid mine drainage formation,
- State approval process,
- Public participation
- Ground-water monitoring (both during and after placement),
- Enforceable limits,
- Operational requirements/placement engineering,
- Closure requirements, and
- Corrective action.

BLRWM does not require a solid waste disposal permit for coal ash placement (or any other beneficial uses) if the mine operator conforms to beneficial use requirements. Mine placement of coal ash is not allowed unless a beneficial use is demonstrated. BLRWM has the authority for approval of the beneficial use of coal ash for mine subsidence control, mine fire control, and mine sealing.

References

Pennsylvania Regulations: 25 PA Code 287.661-666; 25 PA Code 86-90

Beneficial Uses of Coal Ash at Active Coal Mine Sites (BMR, 563-2112-206)

Certification Guidelines for Beneficial Uses of Coal Ash (BMR, 563-2112-224)

Technical Guidance Document for Beneficial Uses of Coal Ash (BMR, 563-2112-225)

Module 25: Coal Ash Beneficial Use. 5600-PM-MR0311. Rev. 3/01

Module 27: Sewage Sludge/Coal Ash Beneficial Use. 5600-PM-MR0311. Rev. 3/01

Michael Menghini, District Mining Operations, Pennsylvania Department of Environmental Protection and Bill Pounds, Pennsylvania Department of Environmental Protection. Presentation at IMCC Intergovernmental Forum on Mine Placement of Coal Combustion Wastes. May 15-16, 2001. St. Louis, Missouri.

Michael Menghini, District Mining Operations, Pennsylvania Department of Environmental Protection (written comments to EPA, 11/26/01).

Michael Menghini, District Mining Operations, Pennsylvania Department of Environmental Protection (telephone comments to EPA, 11/20/02).

CCW Minefill Management Practices Discussion Guide. June 12, 2002 – Pennsylvania. U.S. Environmental Protection Agency.

PENNSYLVANIA				
Allowed Uses	**CCW Placement**	**Alkaline Addition**	**Low Permeability Use**	**Soil Additive Use**
Regulatory Agency Oversight	Pennsylvania Department of Environmental Protection: • Bureau of Mining and Reclamation (BMR) • Bureau of District Mining Operations (BDMO) • Bureau of Land Recycling and Waste Management (BLR)			
Before Placement				
Distinction Between Beneficial Use and Disposal	Must demonstrate that the project will achieve an overall improvement in water quality or prevent degradation of water quality from the mining and reclamation activity to be permitted as a beneficial use. Also, the amount of ash allowed to be utilized varies depending on the legitimacy of the reason for the proposed volume.			
Site Characterization	*Substantively similar to federal SMCRA, plus:* Background ground-water quality monitoring is necessary, using 6 samples taken at monthly or 6-week intervals.			*Substantively similar to federal SMCRA, plus:* • Provisions at left. • Background analysis of soil or spoil top cover is necessary to determine if contaminated.
Siting Restrictions	*Substantively similar to federal SMCRA, plus:* Use allowed only in: • The pit or area from which coal is extracted under a surface coal mining permit. • Abandoned coal mining areas located within the surface coal mining permit area or when reclamation work is approved by the Department or under a contract with the Department. • Coal refuse disposal sites. And: • The bottom of ash must be at least 8 feet above the top of the regional ground-water table elevation (except for demonstration projects, which can be approved under the residual waste regulations).			*Substantively similar to federal SMCRA, plus:* • Provisions at left. • Not within 100 feet of a stream or wetland. • Not within 300 feet of a water source. • Not within 100 feet of a sinkhole or area draining into a sinkhole. • Not within 300 feet of an exceptional value wetland.
Reclamation Plan	*Substantively similar to federal SMCRA, plus:* Beneficial uses must be described in the reclamation plan as part of the mine permit application or as part of the mine			

PENNSYLVANIA				
Allowed Uses	**CCW Placement**	**Alkaline Addition**	**Low Permeability Use**	**Soil Additive Use**
	reclamation project.			
Waste Characterization	Certification system must be approved by BMR, includes testing (at the facility generating the ash) for 20 constituents, pH, calcium carbonate equivalent, and hydraulic conductivity (SPLP used for leachate analysis of all metals and pH).			
Waste Characteristic Limits	• Maximum acceptable leachate concentration is normally 25 times the ground-water parameters for metals and other cations, or 10 times the ground-water parameters for nonmetals. • pH between 7.0-12.5.	As for CCW placement, plus: • Calcium carbonate equivalent of at least 100 parts per thousand or 10% by dry weight.	As for CCW placement, plus: • Hydraulic conductivity $1.0x10^{-6}$ cm/sec or less.	As for CCW placement, plus: • pH between 6.5-8.0. • Maximum loading rates for 9 contaminants (mostly metals). • As a liming agent, calcium carbonate equivalent of at least 100 parts per thousand or 10% by dry weight.
Address Acid-Base Balance/Acid Mine Drainage	*Substantively similar to federal SMCRA, no additional requirements.*	*Substantively similar to federal SMCRA, plus:* Specific application and ground-water monitoring requirements for application of coal ash as an alkaline addition, plus acid-base balance.	*Substantively similar to federal SMCRA, no additional requirements.*	
State Approval Required to Proceed	CCW must be certified for beneficial uses by BMR and BDMO and addressed in the reclamation plan under the mining permit or mine reclamation project. A new permit application or a major permit revision (using Modules 25/27) is required to use coal ash at an active mine site. The permit or permit revision is issued under SMCRA as well as applicable waste regulations and the Clean Streams Law.			
Public Participation	Public notice required.			Not required, but the Department publishes in the State Bulletin.

PENNSYLVANIA				
Allowed Uses	**CCW Placement**	**Alkaline Addition**	**Low Permeability Use**	**Soil Additive Use**
	During Placement			
Ongoing Waste Characterization	The generator must submit information every 6 months (or sooner if there are any changes in operation of the combustion unit generating the coal ash) to demonstrate that the ash continues to meet the certification guidelines.			
Ground-water Monitoring	*Substantively similar to federal SMCRA, plus:* • For active coal mine sites, quarterly sampling for 11 parameters and annually for 15 more parameters. • For abandoned mine sites, sampling frequency determined by the BMR for 26 parameters. • There must be at least one downgradient monitoring point from an active coal mine site.			*Substantively similar to federal SMCRA, no additional requirements.*
Performance Standards	*Substantively similar to federal SMCRA, no additional requirements.*			
Enforceable Limits **Corrective Action**	*Substantively similar to federal SMCRA, plus:* Ash cannot produce a leachate exceeding DEP established limits and the State has specific corrective action authority applicable to mine placement. Corrective actions can occur when the coal ash being used no longer meets the standards for coal ash beneficial use, or when the ground-water monitoring parameters which are quarterly and/or annual are exceeding the background ground-water parameters. In addition, any violation of the mine permit that addresses coal ash beneficial use would require corrective action.			
Operational Requirements/ Placement Engineering	*Substantively similar to federal SMCRA, plus:* • No waste or other materials may be mixed with CCW except for the purposes of pH adjustment and hardening. • The bottom of ash must be at least 8 feet above the top of the regional ground-water table elevation (except for demonstration projects, which can be approved under the residual waste regulations). • Dust control measures. • Erosion and sediment controls. • An operations map showing the areal extent of the beneficial use of coal ash and the monitoring locations, if applicable. • The site operations plan must address how the ash will be handled and placed.	*Substantively similar to federal SMCRA, plus:* • Provisions for CCW placement. • Must have a minimum thickness of 2 feet (exceptions on a site-by-site basis). • Addressed in site operations plan (see CCW placement) • Standard and specific conditions (see CCW placement)	*Substantively similar to federal SMCRA, plus:* • Provisions for CCW placement. • Use as soil substitute cannot exceed 3 feet in depth. • Use as soil additive cannot exceed 1 foot in depth. • Control surface runoff with runoff control structures. • Not in contact with the

PENNSYLVANIA				
Allowed Uses	**CCW Placement**	**Alkaline Addition**	**Low Permeability Use**	**Soil Additive Use**
	• Standard conditions for ash placement and monitoring and site- or placement-specific conditions where necessary.			seasonal high water table. • CCW must be incorporated into the soil within 48 hours of application. • May not be applied to soil being used for agriculture where the soil pH is <5.5. • Addressed in site operations plan (see CCW placement) • Standard and specific conditions (see CCW placement)
Closure/Post Closure Care				
Ongoing Ground-water Monitoring	*Substantively similar to federal SMCRA, plus:* • Monitoring for the additional parameters must continue with quarterly reports and annual reports submitted through Stage 2 of bond release. • Ground-water monitoring may be extended by BMR if there is an indication of ground-water degradation.			*Substantively similar to federal SMCRA, no additional requirements.*
Performance Bonding or Financial Assurance	*Substantively similar to federal SMCRA, no additional requirements.*			
Other Closure/Post-closure Requirements	*Substantively similar to federal SMCRA, plus:* Final cover of four feet is required in most cases. The ash placement area must achieve a final grade that promotes runoff. Also, final reclamation entails the revegetation and stabilization of all affected areas.			

PENNSYLVANIA: Noncoal Mines

Although Pennsylvania's regulations allow utilization of CCW in noncoal mines, very little activity has occurred. Under a demonstration project, CCW was placed in a limestone quarry and monitored for ten years. The State has denied subsequent permit applications for placing ash in quarries.

Beneficial uses of CCW on mine sites are under the control of the Bureau of Mining and Reclamation (BMR), Bureau of District Mining Operations (BDMO), and the Bureau of Land Recycling and Waste Management (BLRWM). The controls applicable to abandoned noncoal mine sites are the same as for active and abandoned coal mines sites, as summarized in the Pennsylvania summary profile for coal mines, found above.

The controls on CCW placement in active noncoal mines are similar to abandoned noncoal mines in that the beneficial use of coal ash for mine subsidence control, mine fire control, and mine sealing is allowed. BLRWM does not require a solid waste disposal permit for the beneficial use of CCW if the mine operator conforms to the beneficial use requirements.

According to Mike Menghini, BMR, the Coal Ash Beneficial Use Certification Application would likely be adapted for the use of CCW on an active noncoal mine site and reviewed by BLR. BMR would perform, on a site-by-site basis, the following activities and considerations:

- An assessment of the geologic setting/type of rock
- Installation of a monitoring system
- Site characterization (i.e., benchmark testing of ground-water quality)
- CCW characterization (applicable controls will depend on the type of ash and its characteristics)
- Examination of sink holes and any conduits for flow
- Determination of the proximity of any public or private drinking water supplies

References

Pennsylvania Regulations: 25 PA Code 287.661-666; 25 PA Code 86-90

Certification Guidelines for Beneficial Uses of Coal Ash (BMR, 563-2112-224)

Technical Guidance Document for Beneficial Uses of Coal Ash (BMR, 563-2112-225)

Module 25: Coal Ash Beneficial Use. 5600-PM-MR0311. Rev. 3/01

Module 27: Sewage Sludge/Coal Ash Beneficial Use. 5600-PM-MR0311. Rev. 3/01

Michael Menghini, District Mining Operations, Pennsylvania Department of Environmental Protection and Bill Pounds, Pennsylvania Department of Environmental Protection. Presentation at IMCC Intergovernmental Forum on Mine Placement of Coal Combustion Wastes. May 15-16, 2001. St. Louis, Missouri.

Mike Menghini, District Mining Operations, Pennsylvania Department of Environmental Protection (personal communication, 10/24/01)

Michael Menghini, District Mining Operations, Pennsylvania Department of Environmental Protection (telephone comments to EPA, 11/20/02).

CCW Minefill Management Practices Discussion Guide. June 12, 2002 – Pennsylvania. U.S. Environmental Protection Agency.

TENNESSEE: Coal Mines

In Tennessee, CCW mine placement has yet to occur. If it were to occur, it would be subject to applicable Federal mining regulations – the coal mining program is administered by US Department of the Interior's Office of Surface Mine Reclamation and Enforcement (OSM) rather than the State. In addition, the Tennessee Department of Environmental Conservation (TDEC), Division of Solid and Hazardous Waste Management Solid Waste Program allows CCW to be beneficially reused under specific coal ash permit-by-rule regulations if testing confirms the CCW to be non-hazardous. The permit-by-rule regulations would likely be applied to CCW mine placement, were such a project proposed. The regulations require prior written notification of the beneficial use (or a request for a case-by-case approval) and address the following:

- Siting restrictions,
- Reclamation plan,
- Waste characteristic limits,
- State approval process,
- Ground-water monitoring (may be required on a site-by-site basis),
- Operational requirements/placement engineering,
- Financial assurance (may be required on a site-by-site basis), and
- Closure requirements.

References

Tennessee Regulations: TCA § 1200-1-7-.02(1)(c)(1)(ii)

Glen Pugh, TDEC, Division of Solid/Hazardous Waste Management (personal communication, 4/25/01)

TENNESSEE	
Regulatory Agency Oversight	• US Department of the Interior OSM • Tennessee Department of Environmental Conservation (TDEC), Division of Solid and Hazardous Waste Management
Allowed Uses	Mine placement.
Before Placement	
Distinction Between Beneficial Use and Disposal	Not required *(as per federal SMCRA)*
Site Characterization	*Regulated by OSM under federal SMCRA, no additional requirements.*
Siting Restrictions	*Regulated by OSM under federal SMCRA, plus:* • Not in wetlands, sink holes or caves, or in 100-year floodplain unless certain conditions are met. • Cannot be located where the activity would affect endangered or threatened species or habitats. • A geologic buffer of 3 feet is required between base of fill and the seasonal higher water table of the uppermost unconfined aquifer.
Reclamation Plan	*Regulated by OSM under federal SMCRA, no additional requirements.*
Waste Characterization	Not required *(as per federal SMCRA)*.
Waste Characteristic Limits	CCW must be non-hazardous.
Address Acid-Base Balance/Acid Mine Drainage	*Regulated by OSM under federal SMCRA, no additional requirements.*
State Approval Required to Proceed	*Regulated by OSM under federal SMCRA, plus:* Prior written notification of the beneficial use (or a request for a case-by-case approval) must be submitted to TDEC and approved. Permit-by-rule authorization must be kept at the facility.
Public Participation	*Regulated by OSM under federal SMCRA, no additional requirements.*

TENNESSEE	
During Placement	
Ongoing Waste Characterization	Not required *(as per federal SMCRA)*.
Ground-water Monitoring	*Regulated by OSM under federal SMCRA, plus:* Additional monitoring may be required by TDEC for specially-approved projects.
Performance Standards	*Regulated by OSM under federal SMCRA, plus:* Fill area must be operated, maintained, and closed in a manner so as to minimize: • Potential for harmful release of CCW. • Potential for harm to public through uncontrolled access.
Enforceable Limits	*Regulated by OSM under federal SMCRA, no additional requirements.*
Corrective Action	*Regulated by OSM under federal SMCRA, no additional requirements.*
Operational Requirements/ Placement Engineering	*Regulated by OSM under federal SMCRA, plus:* Must have: • The appropriate equipment available to spread and compact the coal ash and for handling the earthwork. • An artificial or natural barrier to control access. • A geologic buffer of 3 feet between base of fill and the seasonal higher water table of the uppermost unconfined aquifer. • Dust control measures. • One permanent benchmark (i.e., concrete marker).

TENNESSEE	
Closure/Post Closure Care	
Ongoing Ground-water Monitoring	*Regulated by OSM under federal SMCRA, plus:* Additional monitoring may be required by TDEC for specially-approved projects.
Performance Bonding or Financial Assurance	*Regulated by OSM under federal SMCRA, plus:* Financial assurance may be required by TDEC for specially-approved projects.
Other Closure/Post-closure Requirements	*Regulated by OSM under federal SMCRA, plus:* • Within 90 days of completion, final cover of 2 feet of compacted soil, except those areas already covered by barriers to water infiltration. • Upper 6 inches of cover must be able to support vegetation. • Final surface graded and provided with drainage facilities in a manner that: minimizes erosion of cover material (no steep slopes, use of mulch, silt barriers), promotes drainage (prevents pooling), and provides a drainage system consistent with the surrounding area.

TENNESSEE: Noncoal Mines

In Tennessee, the placement of CCW in a noncoal mine has yet to occur. The Tennessee Department of Environmental Conservation (TDEC), Division of Solid and Hazardous Waste Management Solid Waste Program allows CCW to be beneficially reused under specific coal ash permit-by-rule regulations if testing confirms the CCW to be non-hazardous. The permit-by-rule regulations, which would likely be applied to CCW noncoal mine placement, require prior written notification and are summarized in the Tennessee summary profile for coal mines, found above.

In addition to the solid waste regulations, CCW placement would be subject to applicable State noncoal mining regulations that require the following:

- Public notice and comment
- Performance bonds (e.g., cash, treasury bonds, municipal or corporate bonds)
- A mining and reclamation plan, including a detailed map
- Regrading to approximate original contour and revegetation within 3 months of final mining activity
- Mineral-specific standards for access roads; operation, backfilling and grading; and revegetation. The standards aim to minimize adverse effects to surface and ground-water quality.
- Annual reporting

References

Tennessee Statute: 59-8-201 *et seq.*

Tennessee Regulations: Chapter 0400-3 *et seq.*

TEXAS: Coal Mines

Texas Natural Resource Conservation Commission (TNRCC) solid waste policy allows beneficial uses of CCW as a "co-product," including as backfill to achieve original contours at mine sites. If the placement of CCW at a mine site meets this definition as a beneficial use, it is regulated by the Railroad Commission of Texas, Surface Mining and Reclamation Division (SMRD) and not by TNRCC. SMRD applies State mining regulations that are substantively similar to the federal SMCRA regulations. If the placement is not approved as a beneficial use, TNRCC subjects the practice to solid waste regulations and SMRD defers entirely to TNRCC.

In Texas, coal combustion waste falls under the program for nonhazardous industrial solid waste. No permit is required for disposal of nonhazardous industrial solid waste, if: (1) the waste is disposed on property owned or otherwise effectively controlled by the owner or operator of the plant from which the waste results, (2) the property is within 50 miles of the plant, and (3) the waste is not commingled with waste from any other source not owned by the same person. However, the operator must still notify the State (and include information on waste composition, facility design, and site geology), maintain certain records, and close the site in compliance with the Texas Risk Reduction Program. Mines accepting coal combustion waste not meeting the three permit-exemption criteria must obtain a solid waste permit and are subject to the regulations that address the following:

- Site characterization,
- Siting restrictions,
- Waste characterization,
- Waste characteristic limits,
- State approval process,
- Public participation,
- Ground-water monitoring (both during and after placement),
- Performance standards,
- Enforceable limits,
- Corrective action,
- Operational requirements/placement engineering,
- Financial assurance, and
- Closure requirements.

Nonhazardous industrial solid waste is characterized into Class 1, Class 2, or Class 3 waste. Class 1 is waste that is toxic, corrosive, flammable or may pose a substantial danger to human health or the environment if improperly disposed. Class 3 is inert and essentially insoluble solid waste.[9] Class 2 is any waste that fits neither the Class 1 or Class 3 definitions. According to TNRCC, CCW in Texas is most often characterized as Class 2 waste and sometimes as Class 3. The requirements below are for disposal of Class 2 waste. The requirements for Class 3 are less restrictive—for example, monitoring is not required.

References

Texas Statutes: 5 THSC § 361; TWC § 26.121

Texas Regulations: 30 TAC § 37, § 39, § 330, and § 335 (Subchapters A and R); 16 TAC 12

TNRCC Memo: Coal Combustion By-Products and TRNCC Regulations. August 25, 1995.

TNRCC Memo (to an Operator): Use of Bottom Ash and Fly Ash as a "Co-Product." March 25, 1998.

Jesse Boultinghouse, Texas Natural Resource Conservation Commission (personal communication, 4/11/01)

John Kaudol, Railroad Commission of Texas, Surface Mining and Reclamation Division (personal communication, 4/26/01)

Susi Ferguson, Texas Natural Resource Conservation Commission (personal communication, 6/21/01)

Susi Ferguson, Texas Natural Resource Conservation Commission, and Melvin Hodgkiss, Railroad Commission of Texas, Surface Mining and Reclamation Division. Comments at IMCC Intergovernmental Forum on Mine Placement of Coal Combustion Wastes. May 15-16, 2001. St. Louis, Missouri.

[9] To be classified as Class 3, the leachate from the waste must not exceed State MCLs (which are identical to federal MCLs) when tested using a seven-day distilled water leachate test and must not exhibit detectable levels of organic constituents when tested using TCLP.

TEXAS		
	Disposal	**Beneficial Use**
Regulatory Agency Oversight	Texas Natural Resource Conservation Commission (TNRCC)	Railroad Commission of Texas, Surface Mining and Reclamation Division
Allowed Uses	Placement at mine sites in approved disposal areas.	Placement at mine sites for beneficial uses, including backfill to achieve original contour
Before Placement		
Distinction Between Beneficial Use and Disposal	Placement other than for the purpose of reclamation or placement that delays contemporaneous reclamation is defined as disposal.	Placement for the purpose of reclamation is defined as beneficial use
Site Characterization	The background water quality must be established.	*Substantively similar to federal SMCRA, no additional requirements.*
Siting Restrictions	There are restrictions on: • Fault areas (not within 200 feet of a fault). • Floodplains. • Wetlands. • Seismic impact zones. • Unstable areas. Also, lowest level of disposal must be above the seasonal high water table.	*Substantively similar to federal SMCRA, no additional requirements.*
Reclamation Plan	Not required.	*Substantively similar to federal SMCRA, plus:* CCW placement must be addressed in the reclamation plan
Waste Characterization	Waste characterization is required using approved EPA methods or an alternate method. The coal combustion waste may be designated a Class 1, 2, or 3 waste.	Not required *(as per federal SMCRA)*
Waste Characteristic Limits		None specified *(as per federal SMCRA)*
Address Acid-Base Balance/Acid Mine Drainage	Not required.	*Substantively similar to federal SMCRA, no additional requirements.*

TEXAS		
	Disposal	**Beneficial Use**
State Approval Required to Proceed	A solid waste permit is required, unless the waste is disposed on the generator's own property. If the latter, only notification is required.	*Substantively similar to federal SMCRA, no additional requirements.*
Public Participation	The issuance of a solid waste permit is subject to public notice and comment requirements that are substantively similar to SMCRA's.	*Substantively similar to federal SMCRA, no additional requirements.*
During Placement		
Ongoing Waste Characterization	Not required.	Not required *(as per federal SMCRA).*
Ground-water Monitoring	• Must submit a ground-water sampling and analysis plan. • Downgradient monitoring system shall ensure the detection of ground-water contamination of the uppermost aquifer. • At a minimum, detection monitoring for 62 constituents is required, although TNRCC may alter the list. • Assessment monitoring is required whenever a statistically significant change from background levels has been detected. • Semi-annual sampling is required through the post-closure period.	*Substantively similar to federal SMCRA, no additional requirements.*
Performance Standards	The disposal activity may not cause: • The discharge or imminent threat of discharge into waters of the State without NPDES permit authorization. • The creation and maintenance of a nuisance. • The endangerment of the public health and welfare.	*Substantively similar to federal SMCRA, no additional requirements.*

TEXAS		
	Disposal	**Beneficial Use**
Enforceable Limits	If assessment monitoring detects a statistically significant level above ground-water quality protection standards (MCLs or site-specific background concentrations for constituents without MCLs), then an assessment of corrective measures is required.	*Substantively similar to federal SMCRA, no additional requirements.*
Corrective Action		*Substantively similar to federal SMCRA, no additional requirements.*
Operational Requirements/ Placement Engineering	• Site operating plan. • Composite liner (30 mil flexible membrane liner and 2 feet compacted soil). • Leachate collection and removal system. • Ensure lowest level of disposal is above the seasonal high water table. • Compact and cover daily. • Dust control. • Endangered species protection.	*Substantively similar to federal SMCRA, no additional requirements.*
Closure/Post Closure Care		
Ongoing Ground-water Monitoring	Required until the end of the post-closure period.	*Substantively similar to federal SMCRA, no additional requirements.*
Performance Bonding or Financial Assurance	• Required for closure, post-closure, and the completion of any corrective action. • Trust fund, letter of credit, insurance, financial test, or corporate guarantee.	*Substantively similar to federal SMCRA, no additional requirements.*

TEXAS		
	Disposal	**Beneficial Use**
Other Closure/Post-closure Requirements	• Final closure and post-closure plans required. • Within 180 days of final receipt of waste, must place a final cover system with at least 2 feet of soil and consisting of an infiltration layer and an erosion layer of at least 6 inches. • Closure must be compliant with the standards of the Texas Risk Reduction Program. This program requires that the closure design minimize or eliminate post-closure escape of waste, contaminants, leachate, or run-off and minimize or eliminate the need for further maintenance and control. • Post-closure period of at least 30 years (may be reduced on a case-by-case basis).	*Substantively similar to federal SMCRA, no additional requirements.*

TEXAS: Noncoal Mines

As with coal mines, the Texas Natural Resource Conservation Commission (TNRCC) solid waste policy allows beneficial use of CCW as backfill to achieve original contours at noncoal mine sites. If the placement of CCW at a noncoal mine site is for this beneficial use, it is regulated solely by the Railroad Commission of Texas, Surface Mining and Reclamation Division (SMRD) and not by TNRCC. In such a case, SMRD applies the State's noncoal mining regulations. With the exception of uranium mines, however, these regulations cover safety only. The uranium mining regulations are outlined below. If the placement is not approved as a beneficial use, TNRCC subjects the practice to solid waste regulations and SMRD defers entirely to TNRCC. The applicable solid waste requirements are detailed in the Texas summary profile for coal mines, found above.

TNRCC's uranium mine rules (all other noncoal mining is regulated only in terms of safety) require the following:

- Public notice and comment

Reclamation Plan
- Must be consistent with local, physical, environmental, and climatological conditions
- Description of how proposed postmining land condition is to be achieved and the necessary support activities that may be needed
- The steps taken to comply with applicable air and water quality and water rights laws and regulations

Reclamation Standards
- Restore affected land to the premining or substantially beneficial condition
- Stabilize and protect all surface areas as necessary to control erosion and attendant air and water pollution
- Replace the topsoil or best available subsoil on top of land to be reclaimed
- Fill any auger holes to prevent drainage
- Minimize disturbances to the prevailing hydrologic balance and to the quality and quantity of surface water and ground water systems–both during and after mining operation and during reclamation
- Insure that all reclamation efforts proceed as contemporaneously as practicable.
- Provide a screen of natural vegetation between the mining operation and national and State parks, historic areas, and wildlife and scenic areas, as well as public buildings, cemeteries, or churches.
- Provide a drainage system for storm water runoff to avoid significant degradation of area surface and ground waters.
- Cover toxic-forming materials with nontoxic materials

- Revegetation will be considered successful when it is capable of self-regeneration and plant succession, and equal in extent of cover to the natural vegetation of the area.
- Slopes of overburden piles must be shaped to minimize runoff and allow seeding.

Financial Assurance and Insurance

- The amount of the bond depends on the reclamation requirements of the approved permit and is determined by the State.
- The bond is released upon final closure of the mine site. Final closure requires that all reclamation requirements be met and that vegetative cover has sustained itself for a period of four years.

References:

Texas Statutes: 5 THSC § 361; TWC § 26.121

Texas Regulations: 16 TAC 11.71-11.206; 30 TAC § 37, § 39, § 330, and § 335 (Subchapters A and R); 16 TAC 12

TNRCC Memo: Coal Combustion By-Products and TNRCC Regulations. August 25, 1995.

TNRCC Memo (to an Operator): Use of Bottom Ash and Fly Ash as a "Co-Product." March 25, 1998.

Jesse Boultinghouse, Texas Natural Resource Conservation Commission (personal communication, 4/11/01)

John Kaudol, Railroad Commission of Texas, Surface Mining and Reclamation Division (personal communication, 4/26/01)

Susi Ferguson, Texas Natural Resource Conservation Commission (personal communication, 6/21/01)

Susi Ferguson, Texas Natural Resource Conservation Commission, and Melvin Hodgkiss, Railroad Commission of Texas, Surface Mining and Reclamation Division. Comments at IMCC Intergovernmental Forum on Mine Placement of Coal Combustion Wastes. May 15-16, 2001. St. Louis, Missouri.

UTAH: Coal Mines

Currently, there is no placement of CCW in Utah mines. Under Utah solid waste law, CCW is exempt from regulation as a solid waste unless it causes a public nuisance or public health hazard, or is otherwise determined to be a hazardous waste. Therefore, if CCW mine placement were to occur, it would be under the sole jurisdiction of the Utah Department of Natural Resources, Division of Oil, Gas, and Mining and be subject to State mining regulations that are substantively identical to Federal SMCRA regulations. According to Daron Haddock of the Division of Oil, Gas, and Mining, the review and approval of the activity, as part of the reclamation plan under a surface mining permit, would most likely be the same as for the onsite disposal of noncoal mine waste or coal processing waste.

References

Utah Statutes: UCA 19-6-102(17)(b)(iii)

Utah Regulations: R645-100 *et seq.*

Daron Haddock, Utah Department of Natural Resources, Division of Oil, Gas, and Mining (personal communication, 5/2/01)

Daron Haddock, Utah Department of Natural Resources, Division of Oil, Gas, and Mining. Comments at IMCC Intergovernmental Forum on Mine Placement of Coal Combustion Wastes. May 15-16, 2001. St. Louis, Missouri.

VIRGINIA: Coal Mines

The Virginia Department of Mines, Minerals and Energy, Division of Mined Land Reclamation (DMME) has sole jurisdiction over the beneficial use of CCW on permitted mine sites. Under Virginia law, CCWs are exempt from all solid waste regulations if considered a beneficial use under DMME's program. The Virginia Department of Environmental Quality has developed specific regulations regarding the beneficial use of CCW, which are to be implemented by DMME in cases of mine reclamation or mine refuse disposal at a mine site permitted by DMME (which have yet to happen since the regulations were developed in 1995). The regulations do not require DMME approval prior to CCW mine placement, but do require notification. The regulations also include the following:

- Siting restrictions,
- Reclamation plan,
- Waste characterization,
- Waste characteristic limits,
- Enforceable limits (may be established on a site-by-site basis), and
- Operational requirements/placement engineering.

If the use of CCW for mine placement activity is not considered a beneficial use by DMME or if the CCW contains a constituent that exceeds the waste characteristic limits set forth in the regulations, then a solid waste permit is required. Virginia's solid waste permit requirements are summarized in *Regulation of Landfills and Surface Impoundments Managing Coal Combustion Waste in 26 States*, December 14, 2000. Because details regarding the applicability of these requirements to mine placement projects have not yet be tested through implementation, the requirements are not summarized here.

References

Virginia Statutes: 45.1 CV Chapter 19

VR 672-20-20, February 22, 1995; VR 480-03-19

9 VAC 20-80-150, 20-80-160, and 20-85 *et seq.*

Guidelines for Use of Coal Combustion By-Products on DMME/DMLR Permits (2/95)

Lynn Haynes, Virginia Department of Mines, Minerals and Energy, Division of Mined Land Reclamation (personal communication, 6/21/01)

VIRGINIA	
Regulatory Agency Oversight	Virginia Department of Environmental Quality, Department of Mines, Minerals and Energy, Division of Mined Land Reclamation (DMME)
Allowed Uses	For mine reclamation or mine refuse disposal on a DMME-permitted mine site.
Before Placement	
Distinction Between Beneficial Use and Disposal	The operator must show that the use of the CCW on the mine site would serve a beneficial purpose in the reclamation efforts, otherwise it would be considered disposal. However, since there has yet to be a proposal to use CCW on a mine site, there has been no test of what is considered to be a "beneficial use."
Site Characterization	*Substantively similar to federal SMCRA, plus:* The Probable Hydrologic Consequences (PHC) assessment must also address use of CCW on the coal mine site.
Siting Restrictions	*Substantively similar to federal SMCRA, plus:* CCW cannot be placed: • In areas subject to base floods, except in certain situations. • With the vertical separation between the CCW and the maximum seasonal water table or bedrock less than two feet. • Closer than 100 feet from any perennial stream, water well, or sinkhole. • Closer than 25 feet from a bedrock outcrop or property boundaries. • In wetlands, unless appropriate permits are obtained. • At the site of an active or inactive dump, unpermitted landfill, lagoon or similar facility, even if closed.
Reclamation Plan	*Substantively similar to federal SMCRA, plus:* 30 days prior to initial placement: • Certify owner has legal control for the project life and closure period, operation is in compliance with local ordinances, and owner will allow compliance inspections. • Describe intended use, the site, estimated start and completion dates, and the volume to be used. • Certify that locational restrictions are satisfied and project is designed to specified standards. • Submit an operation plan and closure plan.
Waste Characterization	Describe the physical and chemical characteristics of the CCW, including TCLP analyses for 8 constituents.
Waste Characteristic Limits	• Arsenic, Chromium, Lead, Silver less than 5.0 mg/l. • Barium less than 100 mg/l. • Cadmium and Selenium less than 1.0 mg/l. • Mercury less than 0.2 mg/l.

VIRGINIA	
Address Acid-Base Balance/Acid Mine Drainage	*Substantively similar to federal SMCRA, no additional requirements.*
State Approval Required to Proceed	If the mining and reclamation permit already includes the applicable provisions of the CCW regulations (Parts II and IV), then CCW placement would require only notification to DMME, including a certification and description of activities. If the permit does not already include the applicable provisions of the CCW regulations, then CCW placement would require a major permit revision.
Public Participation	*Substantively similar to federal SMCRA, no additional requirements.*
During Placement	
Ongoing Waste Characterization	Not required *(as per federal SMCRA)*.
Ground-water Monitoring	*Substantively similar to federal SMCRA, no additional requirements.*
Performance Standards	*Substantively similar to federal SMCRA, no additional requirements.*
Enforceable Limits	*Substantively similar to federal SMCRA, plus:* Specific enforceable limits may be established on a site-by-site basis.
Corrective Action	*Substantively similar to federal SMCRA, no additional requirements.*
Operational Requirements/ Placement Engineering	*Substantively similar to federal SMCRA, plus:* Operation plan must include: • Control of tracking of CCW onto public roads. • Prohibition on addition of any solid waste. • Control of fugitive dust. • CCW placed in no greater than 1 foot layers and then compacted. • A surface run-on and run-off control program. Also, the vertical separation between the CCW and the maximum seasonal water table or bedrock cannot be less than two feet.

VIRGINIA	
Closure/Post Closure Care	
Ongoing Ground-water Monitoring	*Substantively similar to federal SMCRA, no additional requirements.*
Performance Bonding or Financial Assurance	*Substantively similar to federal SMCRA, no additional requirements.*
Other Closure/Post-closure Requirements	*Substantively similar to federal SMCRA, no additional requirements.*

WASHINGTON: Coal Mines

In Washington, placement of CCW in mines is subject to applicable Federal mining regulations – the mining program is administered by US Department of the Interior's Office of Surface Mine Reclamation and Enforcement (OSM) rather than the State. In addition, the Washington Department of Ecology (DOE) considers CCW to be a solid waste that must be permitted when placed in a mine. The solid waste permitting authority is legislated to local health departments. At present, DOE is in the initial stages of developing CCW beneficial use policy. The current regulatory structure allows for case-specific requirements to be determined by the local authorities in the solid waste permits. The table below includes local permit requirements for a mine currently accepting CCW to be incorporated as backfill.

References

Washington Regulations: WAC 173-303-016; 173-304-461

Chuck Matthews, Washington Department of Ecology (personal communication, 4/27/01)

PacifiCorp's Centralia Coal Mine Solid Waste Permit for 2000 (issued by Lewis County Health & Social Services, Chehalis, WA)

WASHINGTON	
Regulatory Agency Oversight	• US Department of the Interior OSM • Washington Department of Ecology • Local health departments
Allowed Uses	Mine placement.
Before Placement	
Distinction Between Beneficial Use and Disposal	Not required *(as per federal SMCRA)*
Site Characterization	*Regulated by OSM under federal SMCRA, no additional requirements.*
Siting Restrictions	*Regulated by OSM under federal SMCRA, plus:* May not be located on any hill whose slope is unstable.
Reclamation Plan	*Regulated by OSM under federal SMCRA, no additional requirements.*
Waste Characterization	Not required *(as per federal SMCRA)*.
Waste Characteristic Limits	None specified *(as per federal SMCRA)*.
Address Acid-Base Balance/Acid Mine Drainage	*Regulated by OSM under federal SMCRA, no additional requirements.*
State Approval Required to Proceed	*Regulated by OSM under federal SMCRA, plus:* A solid waste disposal permit is required and must be obtained from the local health department.
Public Participation	*Regulated by OSM under federal SMCRA, no additional requirements.*

WASHINGTON	
During Placement	
Ongoing Waste Characterization	Not required *(as per federal SMCRA)*
Ground-water Monitoring	*Regulated by OSM under federal SMCRA, plus:* • At least three ground-water monitoring wells are required; one upgradient and two downgradient of the backfilled areas incorporating the CCW • Monitoring data must be submitted annually
Performance Standards	*Regulated by OSM under federal SMCRA, no additional requirements.*
Enforceable Limits	*Regulated by OSM under federal SMCRA, no additional requirements.*
Corrective Action	*Regulated by OSM under federal SMCRA, no additional requirements.*
Operational Requirements/ Placement Engineering	*Regulated by OSM under federal SMCRA, plus:* • Maintain record of the weights or volumes and types of wastes disposed at the site • All closed portions of the site must be maintained to prevent excess water intrusion • Must be at least one person on-site during all disposal events who is a State-certified landfill operator
Closure/Post Closure Care	
Ongoing Ground-water Monitoring	*Regulated by OSM under federal SMCRA, no additional requirements.*
Performance Bonding or Financial Assurance	*Regulated by OSM under federal SMCRA, no additional requirements.*
Other Closure/Post-closure Requirements	*Regulated by OSM under federal SMCRA, no additional requirements.*

WEST VIRGINIA: Coal Mines

When CCW is beneficially used at mine sites, the activity is under the authority of the West Virginia Department of Environmental Protection Office of Mining and Reclamation (OMR). OMR applies State mining regulations that are substantively similar to the Federal SMCRA regulations. OMR requires a modification of the mining permit and has developed written guidelines specific to CCW beneficial use at mine sites. The guidelines address the following:

- Site characterization,
- Reclamation plan,
- Waste characterization (both pre-placement and during placement),
- Acid mine drainage,
- State approval process,
- Ground-water monitoring (both during and after placement),
- Enforceable limits (may be established on a site-by-site basis), and
- Operational requirements/placement engineering.

It is the State's policy to use a volume ratio of 8:1 (CCW to coal refuse) to decide if the use of CCW is a beneficial use at the mine site. If the ratio is exceeded, the use is then considered disposal. Projects constituting disposal under this definition have not yet been pursued in West Virginia. According to OMR staff, however, were such projects proposed, they would require a solid waste permit from the Department of Environmental Protection's Office of Solid Waste (OSW). West Virginia's solid waste permit requirements are summarized in *Regulation of Landfills and Surface Impoundments Managing Coal Combustion Waste in 26 States*, December 14, 2000. Because details regarding the applicability of these requirements to mine placement projects have not yet been tested through implementation, the requirements are not summarized here.

References

West Virginia Statutes: West Virginia Code Chapter 22, Article 3

West Virginia Regulations: 33 CSR 1-5.5.b.4; 33 CSR 2, Sections 1-22

Mining and Reclamation Policy Memo: Disposal and Utilization of Coal Ash on Surface Mining Operations. January 3, 1994.

Application for Coal Ash Utilization. MR-36, January 1994.

Coal Combustion By-Product Utilization Policy. January 13, 1998.

Harold "Rocky" Parsons, Office of Mining and Reclamation, West Virginia Department of Environmental Protection (personal communication 4/11/01)

Harold "Rocky" Parsons, Office of Mining and Reclamation, West Virginia Department of Environmental Protection. Presentation at IMCC Intergovernmental Forum on Mine Placement of Coal Combustion Wastes. May 15-16, 2001. St. Louis, Missouri.

WEST VIRGINIA	
Regulatory Agency Oversight	West Virginia Department of Environmental Protection: • Office of Mining and Reclamation (OMR) • Office of Solid Waste (OSW)
Allowed Uses	Use as soil amendments, use on surface mining operations, to fill voids in permitted underground mines, and other uses as approved by OMR.
Before Placement	
Distinction Between Beneficial Use and Disposal	Under State policy, projects using less than an 8:1 ratio of CCW to coal refuse are defined as beneficial use and subject to the requirements summarized here. Projects exceeding this ratio would be considered disposal and regulated by OSW.
Site Characterization	*Substantively similar to federal SMCRA, plus:* Water quality sampling and analysis for 19 parameters is required.
Siting Restrictions	*Substantively similar to federal SMCRA, no additional requirements.*
Reclamation Plan	*Substantively similar to federal SMCRA, plus:* Applicants must provide a coal ash utilization plan that includes: • A map of the proposed coal ash utilization area, with certain attributes marked, and a cross-section map. • A description of how the use will affect the mining and reclamation plan, and post-mining land use.
Waste Characterization	At a minimum, leachate analysis for 19 parameters (TCLP testing for metals only) and full testing for all new sources is required.
Waste Characteristic Limits	CCW which exhibits potentially toxic or potentially acid producing characteristics will not be approved for beneficial use.
Address Acid-Base Balance/Acid Mine Drainage	*Substantively similar to federal SMCRA, plus:* Assessment of neutralization potential is required using procedures laid out in OMR guidelines.
State Approval Required to Proceed	*Substantively similar to federal SMCRA, plus:* Requires submission of the Application for Coal Ash Utilization form and a modification of the mining permit, or a solid waste disposal permit (if considered disposal rather than a beneficial use). Modification of the mining permit was initially treated as a major modification, but is currently treated as a minor modification, with some uses pre-approved and requiring notification only.
Public Participation	*Substantively similar to federal SMCRA, no additional requirements.*

WEST VIRGINIA	
During Placement	
Ongoing Waste Characterization	Periodic retesting of all parameters may be required from time to time by the OMR, but the TCLP test (for metals only) must be performed at least annually.
Ground-water Monitoring	*Substantively similar to federal SMCRA, no additional requirements.*
Performance Standards	*Substantively similar to federal SMCRA, no additional requirements.*
Enforceable Limits	*Substantively similar to federal SMCRA, plus:* Specific enforceable limits may be established on a site-by-site basis.
Corrective Action	*Substantively similar to federal SMCRA, no additional requirements.*
Operational Requirements/ Placement Engineering	*Substantively similar to federal SMCRA, no additional requirements, plus:* Applicants must provide a description of the following in the coal ash utilization plan: • Site preparation. • Unloading and stockpiling areas. • Sequence of mining/utilization techniques. • Phases of utilization: 1) compaction of coal ash, 2) equipment to be used, 3) thickness of lifts, 4) methods of utilization. • Application of cover material. • Revegetation procedure. • Dust control methods. • Final slopes and closure procedures.
Closure/Post Closure Care	
Ongoing Ground-water Monitoring	*Substantively similar to federal SMCRA, no additional requirements.*
Performance Bonding or Financial Assurance	*Substantively similar to federal SMCRA, no additional requirements.*
Other Closure/Post-closure Requirements	*Substantively similar to federal SMCRA, no additional requirements.*

WEST VIRGINIA: Noncoal Mines

Although the placement of CCW in noncoal mines has yet to occur in West Virginia, it would fall under the shared authority of the West Virginia Department of Environmental Protection (DEP) Office of Mining and Reclamation (OMR) and DEP's Office of Solid Waste (OSW). Unlike CCW placement in coal mines, there are no specific State guidelines addressing CCW placement in noncoal mines. Such an activity would be subject to the State's regulations for noncoal mining operations (summarized below) and the solid waste regulations. According to John Britvec, DEP, the placement of CCW in a noncoal mine would most likely not be allowed by the solid waste program but, if allowed, would require a solid waste permit. He also noted that it was unlikely that a request would be made to place CCW in a noncoal mine since the State has an established an effective program for CCW placement in coal mines.

West Virginia's noncoal surface mining permit regulations require the following:

- Public notice and comment.
- Information on fish and wildlife resources, endangered species, historic places and archaeological sites, and water quantity.
- A site assessment, including baseline surface and ground-water monitoring.
- A drainage plan, including sediment control structures.
- Toxic materials must be handled in such a way as to prevent water pollution.
- Reclamation of all disturbed areas in accordance with a reclamation plan.
- The material used to backfill, reduce, or eliminate a highwall must be sufficiently compacted or otherwise mechanically stabilized to ensure stability of the backfill. Compliance with the regulation's detailed fill specifications is required.
- Revegetation with native species or introduced species that are compatible to the approved postmining land use.
- Financial assurance. Release of the bond is upon completion of reclamation (which is once the vegetation meets the appropriate evaluation standards) and after the requirements of the permit have been fully complied with.

References

West Virginia Statute: W.Va. Code, Chapter 22, Article 4

West Virginia Regulations: Title 38, Series 3

John Britvec, Division of Water Resources, West Virginia Department of Environmental Protection (personal communication, 12/12/01)

WISCONSIN: Noncoal Mines

The oversight authority and applicable regulations for the placement of CCW in a noncoal mine site depends on whether it is an active or abandoned mine.

For abandoned noncoal mines, the Department of Natural Resources, Solid Waste Program has sole jurisdiction. If a determination is made that the placement of the CCW is strictly for disposal purposes, then it would be regulated as such under the solid waste regulations explained in *Regulation of Landfills and Surface Impoundments Managing Coal Combustion Waste in 26 States*. If the CCW is to be used to fill an abandoned mine for purposes of stabilization, for example, it would be subject to the State's solid waste "beneficial reuse" regulations (Chapter NR 538, Wis. Adm. Code) and be exempt from licensing. The beneficial reuse provisions dictate the following:

- Performance standards, such as no significant adverse impact on wetlands, critical habitat areas, surface water quality, or ground-water quality.
- Allowed use as physical stabilization and as geotechnical fill material.
- Public participation (notice and comment) efforts required for use as geotechnical fill.

If the placement of the waste is in association with an active noncoal mining operation, the activity would be regulated under the metallic mining codes (NR 132 and 182) by the Department of Natural Resources, Mining Program. The metallic mining provisions are very similar to SMCRA and require a permit that is reviewed annually by DNR. Included below are some key general requirements and the additional requirements applicable in the case of disposal of mining waste. The latter, as noted by Larry Lynch, DNR Mining Program, would be applied to CCW at the mine site even though it is not mining waste.

In General

- Mining plan with details of the mining operations and pollution controls
- Performance standards, including:
  - < Grading and stabilization in conformance with State and federal environmental and safety requirements and to prevent erosion and environmental pollution
  - < Compliance with all applicable air, ground and surface water and solid waste and toxic waste disposal laws and rules
  - < Identification and prevention of significant environmental pollution
  - < All underground and surface runoff waters from the mining site must be handled as to prevent soil erosion, flooding, pollution of ground or surface waters, or damage to animals or the public health.

- Location criteria (applicable since 1978). Nothing mining related can be located within:
  - < Areas identified as unsuitable
  - < 1,000 feet of any navigable lake, pond, or flowage
  - < 300 feet of a navigable river or stream
  - < A floodplain
  - < 1,000 feet of the right-of-way for State and federal highways, scenic easements and overlooks, State public parks, wild and scenic rivers, or a bike or hiking trail
  - < Wetlands
- Reclamation plan, including:
  - < A detailed map
  - < Ongoing reclamation procedures during mining operations
  - < Proposed final land use and relationship to surrounding land
  - < Plans for long-term maintenance of the mining site
  - < If not returning affected area to its original state, an explanation of why not
- Monitoring plan, including:
  - < Baseline monitoring data
  - < Ongoing monitoring of wastes and ground-water and surface water quality
  - < If ground-water quality is statistically significantly different from baseline or background, need to notify DNR and implement contingency plan.
  - < DNR may require additional monitoring during the course of the permitted activity
- Performance bond or insurance required to cover operations, any remedial actions necessary while active, and final remediation. The bond is released upon issuance of a certificate of completion of reclamation for the entire mining site.

Additional Requirements When Disposing of Mining Waste[10] (to be incorporated into the mining, monitoring, and reclamation plans above)

- Additional location criteria. No disposal at a mine may occur within:
  - < 1,200 feet of any public or private water supply well
  - < An area likely to be mined in the future
  - < 200 feet of the property line

[10] Applicable to CCW disposal as discussed above.

  - < An area where there is a reasonable probability that the disposal will result in a violation of applicable surface water and ground-water quality criteria and standards
- Ground-water quality and quantity standards (and design criteria to meet standards).
- Feasibility report, including waste characterization and analysis.
- Operation plan for disposal, closure, and long-term care. Includes an economic analysis for site closing and long-term care.
- Leachate management system required if disposal area is lined or has low permeability soils. Liner or soils must be compatible with the waste.
- May require monitoring of leachate and any physical features to assess the impact of the disposal on critical aquatic and terrestrial ecosystems.
- Final slopes between 2 and 33%.
- Final cover to minimize infiltration.
- Closure in accordance with mining reclamation plan.
- Record keeping and reporting.
- Performance bond must additionally cover disposal-specific closure costs and long-term care for a period of 30 years. Application for early termination of the long-term care may be submitted after 10 years of closure.

Finally, while the backfilling of active underground mines would not be regulated as a waste disposal activity, certain basic environmental protection mechanisms would still be applied. Specifically, the backfilling activity must comply with the State's ground-water quality and drinking water standards and the storage, transportation and handling of the material must not result in violations of the regulations applicable to ground water, surface water and air quality protection. Use of such material for backfilling or as an additive to other backfill material would be reviewed as part of the comprehensive mine permitting and environmental impact statement process. Any material used for backfilling would also be subjected to waste characterization studies to assess its acceptability for use as backfill and determine any environmental concerns associated with the intended use.

References

Wisconsin Regulations: NR 538 *et seq*.; NR 132 *et seq*.; NR 182 *et seq*.

Lawrence Lynch, Mining Team Leader, Bureau of Waste Management, Wisconsin Department of Natural Resources (personal communication, 10/24/01)

WYOMING: Coal Mines

The Wyoming Department of Environmental Protection Land Quality Division (LQD) has sole authority over mine disposal of CCW from a mine mouth power plant. Such activity is subject to the general waste provisions of the State mining regulations, which are substantively similar to the federal SMCRA regulations. The LQD is currently developing new regulations that address waste disposal at coal mines and will include specific provisions regarding CCW. The State's current policy is to require a modification to the mining permit for CCW placement. Under its current policy, LQD also requires waste characterization prior to placement.

The Wyoming Department of Environmental Protection Solid and Hazardous Waste Division (SHWD) shares authority with LQD over mine disposal of CCW from a non-mine mouth power plant. Such projects have not yet been pursued in Wyoming. According to Robert A. Doctor of SHWD, however, such activity would likely require a solid waste disposal permit. Wyoming's solid waste permit requirements are summarized in *Regulation of Landfills and Surface Impoundments Managing Coal Combustion Waste in 26 States*, December 14, 2000 and are not included in this summary. Mr. Doctor also noted that SHWD is currently working on a Solid Waste Beneficial Use Guideline that will include CCW. These guidelines most likely will not consider mine placement to be a beneficial use.

References

Wyoming Statutes: WS § 35-11-103(d)(ii)(D); WS § 35-11-401 *et seq.*

Wyoming Regulations: WAC SWM CH.1, § 1(e)(i); WAC LQD CHS. 1 to 20

Robert A. Doctor, Program Manager, Solid Waste Permitting, Solid and Hazardous Waste Division, Wyoming Department of Environmental Protection (personal communication, 4/16/01)

Rick Chancellor, Land Quality Division, Wyoming Department of Environmental Protection (personal communication, 4/27/01 and 6/15/01)

Paige Smith, Land Quality Division, Wyoming Department of Environmental Protection. Comments at IMCC Intergovernmental Forum on Mine Placement of Coal Combustion Wastes. May 15-16, 2001. St. Louis, Missouri.

WYOMING	
Regulatory Agency Oversight	Wyoming Department of Environmental Quality: • Land Quality Division (LQD) • Solid and Hazardous Waste Division (SHWD)
Allowed Uses	Mine placement
Before Placement	
Distinction Between Beneficial Use and Disposal	Wyoming does not currently distinguish between beneficial use and disposal. Placement of CCW from mine-mouth power plants, however, is regulated by the LQD. Placement of CCW from non-mine mouth power plants would be regulated by SHWD.
Site Characterization	*Substantively similar to federal SMCRA, no additional requirements.*
Siting Restrictions	*Substantively similar to federal SMCRA, no additional requirements.*
Reclamation Plan	*Substantively similar to federal SMCRA, no additional requirements.*
Waste Characterization	The LQD treats CCW as a waste material and requires tests to determine the proper method of disposal.
Waste Characteristic Limits	None specified *(as per federal SMCRA)*
Address Acid-Base Balance/Acid Mine Drainage	*Substantively similar to federal SMCRA, no additional requirements.*
State Approval Required to Proceed	*Substantively similar to federal SMCRA, plus:* Requires a modification of the mining permit, or issuance of a solid waste permit, depending on the location of the generating facility. A first time application (i.e., a mine that did not have previous approval as opposed to a mine that wanted to revise a previous approval) would require a major permit modification.
Public Participation	*Substantively similar to federal SMCRA, no additional requirements.*

WYOMING	
During Placement	
Ongoing Waste Characterization	Not required *(as per federal SMCRA)*
Ground-water Monitoring	*Substantively similar to federal SMCRA, no additional requirements.*
Performance Standards	*Substantively similar to federal SMCRA, no additional requirements.*
Enforceable Limits	*Substantively similar to federal SMCRA, no additional requirements.*
Corrective Action	*Substantively similar to federal SMCRA, no additional requirements.*
Operational Requirements/ Placement Engineering	*Substantively similar to federal SMCRA, plus:* Based on waste characterization data, LQD has imposed specific placement engineering requirements on a site-by-site basis. For example, they have required certain CCW to be encapsulated while others have been placed in specific areas of the backfill out of contact with ground water and out of plant routing depth.
Closure/Post Closure Care	
Ongoing Ground-water Monitoring	*Substantively similar to federal SMCRA, no additional requirements.*
Performance Bonding or Financial Assurance	*Substantively similar to federal SMCRA, no additional requirements.*
Other Closure/Post-closure Requirements	*Substantively similar to federal SMCRA, no additional requirements.*