



THE COST OF COAL ASH MISMANAGEMENT: ENERGY FINANCE 2015 CONFERENCE

Final Coal Ash Rule

- Location Restrictions
- Structural Stability Requirements
- Groundwater Protection Standard
- Groundwater Monitoring and Remediation
- Prohibition on Receiving Waste
- Safe Closure

Location Restrictions

Existing ponds may not be:

- Within 5 feet of upper aquifer UNLESS no “intermittent, recurring, or sustained hydraulic connection” to aquifer (§ 257.60).
- In wetland UNLESS no violation of law, net loss, or significant degradation (§ 257.61).
- Within 200 ft. of outermost damage zone of fault UNLESS smaller setback will not damage pond integrity (§ 257.62).
- In seismic zone UNLESS can resist maximum horizontal acceleration in lithified earth material (§ 257.63).
- In an unstable area UNLESS design incorporates good engineering practices (§257.64). *Also applies to landfills.*

Structural Stability Requirements

- Ash ponds without the following subject to closure:
 - Liner with minimum 2 ft. of compacted soil with hydraulic connectivity $<1 \times 10^{-7}$ cm/sec
 - Composite or alternative composite liner (§ 257.71)
 - Alternative composite liner (§ 257.71)
- Within 1.5 years of FR publication, must complete hazard assessment and prepare Emergency Action Plan for significant/high hazard ponds within 6 months.
- Within 1.5 years (and every five years thereafter) must:
 - Compile history of pond's construction
 - Conduct structural stability assessments
 - Conduct safety factor assessments (§ 257.73)

Groundwater Protection Standard

Remediation triggered when Appendix IV pollutants – statistically significantly exceed groundwater protection standards (§ 257.95(g)).

Groundwater Protection Standards:

- Federal Drinking Water Maximum Contaminant Levels or Health Advisories
- Background levels (for contaminants with no federal drinking MCL): If downgradient constituents above upgradient wells. (e.g., cobalt, lithium).
- Note: If background level higher than federal drinking MCL, then standard is the background level.

**Note: unlined ponds with Appendix IV exceedances must stop receiving ash and subject to closure (next slide)*

Groundwater Protection Standard (cont'd)

Remediation requires plan to:

- Notify off-site affected landowners.
- Assess corrective measures (§ 257.97), and –
 - To select a remedy “as soon as feasible” (§ 257.97(a)) to achieve Groundwater Protection Standard;
 - 3 months after selecting a remedy, must initiate remedial activity (§ 257.98(a)) and complete within “reasonable period of time” (§ 257.97(d)).
 - Note: on own schedule, must be complete “within a reasonable period of time” (§ 257.97(d)).

Groundwater Monitoring and Remediation: Existing Ponds and Landfills

Within 2.5 years of FR publication:

- Establish groundwater monitoring system and conduct “detection monitoring” for boron, sulfate, and other appendix III pollutants (§ 257.90, 257.94).

Within 3 months of setting up monitoring, report any exceedance of Appendix III pollutants; and either:

- Demonstrate another source at fault; or
- Establish assessment monitoring for Appendix IV constituents (§ 257.94(e)).

Within 3 months of reporting Appendix III exceedance, must:

- Report Appendix IV exceedances and relevant groundwater standard.(§ 257.95(d)).

Appendix III: boron, calcium, chloride, fluoride, pH, sulfate, TDS

Appendix IV: antimony, arsenic, barium, cadmium, chromium, cobalt, fluoride, lead, lithium, mercury, molybdenum, selenium, thallium, radium 226 and 228 combined

When Ponds Must Stop Receiving Waste

Existing ponds must stop receiving waste within 4 years of FR publication if:

- Cannot meet location/structural stability requirements (§ 257.60-74); or
- Pond is unlined, and assessment monitoring shows groundwater standards have been exceeded (§ 257.96).

Exceptions:

- Ash ponds may stay open up to 5 more years if no alternative disposal (§ 257.103(a)).
- Ash ponds may theoretically stay open until the date it must complete closure if no alternative disposal and retires boilers (see next slide).

When Ponds Must Complete Closure

Existing ponds must complete closure (§ 257.102(f)(1)-(2)):

- Within 7 years if less than 40 acres
 - 5 years plus up to 2 years extension.
- Within 15 years if 40 acres or larger
 - 5 years plus up to 10 years of extension.

When Ponds Must Complete Closure (cont'd)

Exceptions:

- Ash ponds < 40 acres may delay completion of closure for up to 8.5 years if retires boilers and has no alternative disposal (§ 257.103(b)(2)).
- Ash ponds > 40 acres may delay completion of closure for up to 13.5 years if retires boilers and has no alternative disposal capacity (§ 257.103(b)(3)).
- Inactive ponds at active plants subject to rule UNLESS pond closes within 3 years (§ 257.100(b)(1)-(4)).

**Note: If multi-unit system, all unlined ponds within system must close (§ 257.91(d)).*

Coal Ash Mismanagement: The “Cost of Clean”

- Capping and stabilizing sites (especially landfills);
- Alternative disposal capacity (may be offsite);
- Conversion to dry ash handling (for wet bottom boilers);
- Monitoring, remediation, and long-term closure
- Indemnification and bonding;
- Penalties and tort liability (buyouts).

SEC Disclosures

Company	Total Cost (\$ Millions)	Cost Description
Duke Energy	5503	Repairs and remediation relating to Dan River Spill, civil and criminal penalties, closure and disposal of NC and SC ash ponds; conversion to dry disposal in FL, IN, NC, OH, and SC.
Tennessee Valley Authority	2661 to 3161	Cleanup, civil penalty, and private claims relating to Kingston Ash Spill, conversion of remaining TVA coal plants to dry disposal.
Santee Cooper	359.8	Closure and cleanup of SC ash ponds.
First Energy	397.8	Closure plant for 1300 acre Little Blue Impoundment in PA includes capping and dewatering site, groundwater monitoring and remediation, converting Bruce Mansfield plant to dry disposal, civil penalty.
NRG/GenOn	49.5	Capping and closure of Faulkner, Brandywine, and Westland landfills in MD, groundwater monitoring (full cost of remediation unknown), civil penalty.
Exelon	45	Remediation of Gambrills and Rossville ash landfills in MD, civil penalty.