Refresher on the CCR Rule

CIBO

Technical Focus Group, Environmental and Energy Meeting

Arlington, VA

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Two Drivers

- USWAG pushing for legislation that would allow the States to develop a program for regulating coal combustions residuals.
  - S. 612 Bill has been amended to become the Water Infrastructure Improvements for the Nation Act (WINN Act); specifically Section 2301Subtitle C—Control of Coal Combustion Residuals- SEC. 2301. APPROVAL OF STATE PROGRAMS FOR CONTROL 19 OF COAL COMBUSTION RESIDUALS
  - State submits their program to EPA following the CCR rule, EPA would sign off if the rule was the same or as effective as the EPA rule.
    - This would provide EPA enforcement capability and hopefully lessen law suits from Citizens Group
    - The State could go beyond what EPA's rules covered
- Some States are in the process of developing implementing regulations for the EPA CCR Rule. However, these States are planning on regulating CCRs from all sources not just EGUs!

BACKGROUND

Applicability of 40 CFR Subpart D Part 257 Subpart D—Standards for the Disposal of Coal Combustion Residuals in Landfills and Surface Impoundments

- This subpart establishes minimum national criteria for purposes of determining which solid waste disposal facilities and solid waste management practices do not pose a reasonable probability of adverse effects on health or the environment under sections 1008(a)(3) and 4004(a) of the Resource Conservation and Recovery Act.
- (b) This subpart applies to owners and operators of new and existing landfills and surface impoundments, including any lateral expansions of such units that dispose or otherwise engage in solid waste management of CCR generated from the combustion of coal at electric utilities and independent power producers. Unless otherwise provided in this subpart, these requirements also apply to disposal units located off-site of the electric utility or independent power producer. This subpart also applies to any practice that does not meet the definition of a beneficial use of CCR.
- (c) This subpart also applies to inactive CCR surface impoundments at active electric utilities or independent power producers, regardless of the fuel currently used at the facility to produce electricity.

Applicability of 40 CFR Subpart D Part 257
Subpart D—Standards for the Disposal of Coal Combustion Residuals in Landfills and Surface Impoundments

- (d) This subpart does not apply to CCR landfills that have ceased receiving CCR prior to October 19, 2015.
- (e) This subpart does not apply to electric utilities or independent power producers that have ceased producing electricity prior to October 19, 2015.

Applicability of 40 CFR Subpart D Part 257 Subpart D—Standards for the Disposal of Coal Combustion Residuals in Landfills and Surface Impoundments

- (f) This subpart does not apply to wastes, including fly ash, bottom ash, boiler slag, and flue gas desulfurization materials generated at facilities that *are not part* of an electric utility or independent power producer, *such as manufacturing facilities, universities, and hospitals.* This subpart also does not apply to fly ash, bottom ash, boiler slag, and flue gas desulfurization materials, generated primarily from the combustion of fuels (including other fossil fuels) other than coal, for the purpose of generating electricity unless the fuel burned consists of more than fifty percent (50%) coal on a total heat input or mass input basis, whichever results in the greater mass feed rate of coal.

Applicability of 40 CFR Subpart D Part 257
Subpart D—Standards for the Disposal of Coal Combustion Residuals in Landfills and Surface Impoundments

- (g) This subpart does not apply to practices that meet the definition of a beneficial use of CCR.
- (h) *This subpart does not apply to CCR placement at active or abandoned underground or surface coal mines.*
- (i) This subpart does not apply to municipal solid waste landfills that receive CCR.

Applicability of 40 CFR Subpart D Part 257 Continued

- The implementation of the CCR rule is described as a State Function. Is it?
- The rule is also self-implementing, meaning that while utilities must comply with the standards, the federal government cannot enforce the regulations itself. Is it?
- The rule simply sets minimum requirements on how to manage the CCRs. Does it?
- If the minimum requirements are not met the utility or the site could face legal action. How and who?

Two paths of legal action

- The "CITIZEN'S SUIT" which the environmental community has used on a rather consistent basis but have limited their recent efforts to CCRs stored or disposed in impoundments.
- The other legal aspect of the rule not utilized at this point is taking legal action against "OPEN DUMPS".
- "Citizens Suit can also be brought against an OPEN DUMP!"

What is an OPEN DUMP as it relates to CCRs?

- It would be a site that does not meet the various criteria set forth in the rule.
- The rule has both technical criteria regarding sitting, design, operations and monitoring as well as a built in compliance schedules.
- Last but not lease, water quality and air quality are key aspects of the rule.

EPA's Enforcement Capabilities
Relative to CCR sites

- If a CCR site is classified as an "OPEN DUMP", EPA has enforcement capabilities
- If an air quality problem exists (fugitive dust or other), EPA has enforcement capabilities.
- IF there are Clean Water Act violations, EPA has enforcement capabilities.
- If an abandon site and there are water quality or air quality problems, EPA has enforcement capabilities per CERCLA.

The New Problem

- States are developing CCR regulations that expand beyond Electric Utilities and Independent Power Producers to other Industry Sectors and Institutional Sectors.
- As part of this effort, the States will most likely update their Solid Waste Management Plan under Subtitle D.
- States already have delegated water quality and air quality programs.

Another Point

- There is a bill passed by the Senate entitle: "The Water Resources Development Act of 2016 (S. 2848)"
- There is a different version passed by the House.
- The unknown question is "will a conference committee be formed to finalize the bill?" or will it be reintroduced (most likely)?
- In S. 2848, there is a Section 8001 entitled "APPROVAL OF STATE PROGRAMS FOR CONTROL OF COAL COMBUSTION RESIDUALS"
- The Section is designed to allow EPA to approve a State Program, which is believed will reduce the number of citizens suits.
- While this may not be passed this year, most likely their will be a similar version passed in 2017.

Overview of CCR Regulation

(Revisiting in light of State Initiatives)

Compliance Time-Lines

CCR Landfill Compliance

CCR Landfill Compliance

October 19, 2015

- Fugitive dust control plan
- Initial weekly inspection of CCR unit
- Conduct required recordkeeping
- Provide required notifications
  Establish CCR website

January 18, 2016

Complete the initial annual inspection of the CCR unit

CCR Landfill Compliance

October 17, 2016

- Prepare initial run-on and run-off control system plan
- Prepare written closure and post-closure care plans

October 17, 2017

- Install the groundwater monitoring system
- Develop the groundwater sampling and analysis program
- Initiate the detection monitoring program
- Begin evaluating the groundwater monitoring data for statistically significant increases over background levels

CCR Landfill Compliance

October 17, 2018

- Complete demonstration for unstable areas

Existing CCR Surface Impoundments Compliance

CCR Surface Impoundments Compliance

October 19, 2015

- Prepare fugitive dust control plan
- Conduct required recordkeeping
- Provide required notifications
- Establish CCR website
- Initiate weekly inspections of the CCR unit
- Initiate monthly monitoring of CCR unit instrumentation

December 17, 2015

- Install permanent marker

CCR Surface Impoundments Compliance

December 17, 2015

- Install permanent marker

January 18, 2016

- Complete the initial annual inspection of the CCR unit

CCR Surface Impoundments Compliance

October 17, 2016

- Document whether CCR unit is either a lined or unlined CCR surface impoundment
- Compile a history of construction
- Complete initial hazard potential classification assessment
- Complete initial structural stability assessment
- Complete initial safety factor assessment
- Prepare initial inflow design flood control system plan
- Prepare written closure and post-closure care plans

April 17, 2017

- Prepare emergency action plan

CCR Surface Impoundments Compliance

October 17, 2017

- Install the groundwater monitoring system
- Develop the groundwater sampling and analysis program
- Initiate the detection monitoring program
- Begin evaluating the groundwater monitoring data for statistically significant increases over background levels

October 17, 2018

- Complete demonstration for placement above the uppermost aquifer
- Complete demonstrations for wetlands
- Complete demonstrations for fault areas
- Complete demonstrations for seismic impact zones
- Complete demonstrations for unstable areas

The timelines reflect the schedule as encapsulated as part of the implementation of the CCR Rule.

- If a State is developing its regulations, the timelines have significant impact.
- How the State establishes the time lines for compliance could be significant requiring one to insure that any timeline is reasonable.

Impoundment

- Overview from a report entitled:

"The Ultimate Guide: Navigating EPA's Coal Combustion Residuals (CCR) Ruling" by HDR Inc.

Requirements At A Glance By Facility Type EXISTING

	EXISTING CCR LANDFILLS	NEW LANDFILLS
Location Restrictions	Unstable areas	• Placement above the uppermost aquifer • Wetlands • Fault areas • Seismic impact zones • Unstable areas
Design Requirements	Not required	• Leachate collection & removal system • Two component liner

	Existing CCR Landfills	New CCR Landfill
Structural Analysis	Not required	Not required
Operating Criteria	• Fugitive dust controls • Run on, run off control • Surface water protection • Inspection requirements for landfills	• Fugitive dust controls • "Wetting" of CCR • Run on, run off control • Surface water protection • Inspection requirements for landfills

	Existing CCR Landfills	New CCR Landfills
 **Groundwater Monitoring Systems**	• Groundwater monitoring program • Groundwater monitoring wells • 8 rounds of sampling data (by October 17, 2017) • Calculate background levels	• Groundwater monitoring program • Groundwater monitoring wells • 8 rounds of sampling data (within 6 months & before accepting CCR)
 **Closure & Post Closure Requirements**	• Equivalent to liner system • Alternative designs if infiltration criteria is met • 30 years landfill cap & leachate collection maintenance • 30 years of groundwater monitoring	• Equivalent to liner system • Alternative designs if infiltration criteria is met • 30 years landfill cap & leachate collection maintenance • 30 years of groundwater monitoring

Landfills

	Existing CCR Landfills	New CCR
Location Restrictions	Unstable areas	• Placement above the uppermost aquifer • Wetlands • Fault areas • Seismic impact zones • Unstable areas
Design Requirements	Not required	• Leachate collection & removal system • Two component liner

Criteria for Impoundments

EXISTING CCR SURFACE IMPOUNDMENTS	NEW CCR IMPOUNDMENTS UNITS & LATERAL EXPANSIONS	INACTIVE SURFACE IMPOUNDMENTS
• Placement above the uppermost aquifer • Wetlands • Fault Areas • Seismic impact zones • Unstable Areas	• Placement above the uppermost aquifer • Wetlands • Fault areas • Seismic impact zones • Unstable areas	• None if closed by April 17, 2018 • If not, same as existing CCR surface impoundments
Unlined impoundments must: • Meet groundwater protection standards • Retrofit with a composite liner system or be closed	Two component liner	The April 17,2018 date is being eliminated. • None if closed by April 17, 2018 • If not, same as existing CCR surface impoundments

EXISTING CCR SURFACE IMPOUNDMENTS	NEW CCR IMPOUNDMENTS UNITS & LATERAL EXPANSIONS	INACTIVE SURFACE IMPOUNDMENTS
• Hazard potential classification assessments • Spillway adequacy assessments • Structural stability assessments • Safety factor assessments • Emergency action plan • Weekly & annual inspections	• Hazard potential classification assessments • Spillway adequacy assessments • Structural stability assessments • Safety factor assessments • Emergency action plan • Weekly & annual inspections	• None if closed by April 17, 2018 • If not, same as existing CCR surface impoundments
• Fugitive dust controls • Inflow control • Surface water protection • Inspection requirements for CCR surface impoundments	• Fugitive dust controls • "Wetting" of CCR • Inflow control • Surface water protection • Inspection requirements for CCR surface impoundments	• None if closed by April 17, 2018 • If not, same as existing CCR surface impoundments

The April 17, 2018 date is being eliminated.

EXISTING CCR SURFACE IMPOUNDMENTS	NEW CCR IMPOUNDMENTS UNITS & LATERAL EXPANSIONS	INACTIVE SURFACE IMPOUNDMENTS
• Groundwater monitoring program • Groundwater monitoring wells • 8 rounds of sampling data (by October 17, 2017)	• Groundwater monitoring program • Groundwater monitoring wells • 8 rounds of sampling data (within 6 months & before accepting CCR)	• None if closed by April 17, 2018 • If not, same as existing CCR surface impoundments
• Equivalent to liner system • Alternative designs if infiltration criteria is met • 30 years landfill cap maintenance • 30 years of groundwater monitoring	• Equivalent to liner system • Alternative designs if infiltration criteria is met • 30 years landfill cap maintenance • 30 years of groundwater monitoring	The April 17, 2018 date is being eliminated. • None if closed by April 17, 2018 • If not, same as existing CCR surface impoundments

EXISTING CCR SURFACE IMPOUNDMENTS	NEW CCR IMPOUNDMENTS UNITS & LATERAL EXPANSIONS	INACTIVE SURFACE IMPOUNDMENTS
• Compliance documents maintained for 5 years • State agency notification of comprehensive list of actions • All unit documentation publically available on website, titled "CCR Rule Compliance Data and Information"	• Compliance documents maintained for 5 years • State agency notification of comprehensive list of actions • All unit documentation publically available on website, titled "CCR Rule Compliance Data and Information"	• Compliance documents maintained for 5 years • State agency notification of comprehensive list of actions • All unit documentation publically available on website, titled "CCR Rule Compliance Data and Information"

Above Summary Slides Source

- The Ultimate Guide: Navigating EPA's Coal Combustion Residuals (CCR) Ruling

- Website: http://www.hdrinc.com/sites/all/files/assets/markets/hdr-ultimate-ccr-guide-042315.pdf

The Impoundment

- The Impoundment is addressed under the CCR rule.
- The Impoundment is an integral part of the water handling
- The ELG for Steam Electric Generation Facilities Rule is designed to have more stringent effluent limitations directed discharges from impoundments as part of the effort to eliminate impoundments for CCR management.

The CCR Landfill and Storage Areas

- There are effluent limits for runoff from ash storage and disposal areas.
- There are effluent limits for leachate from the CCR disposal areas.

Take-Aways

- As such, the State Regulations need to be monitored closely, in terms of their applicability, their regulatory requirements, their COMPLIANCE SCHEDULE for when the rule applies to facilities not covered by the federal rule.
- This is especially true for beneficial use of CCRs. Also, in the case where the CCRs are used in mine land reclamation with the rules to regulate this aspect of CCR management is to be proposed and implemented by the Federal Office of Surface Mining Reclamation and Enforcement.
- Also, if a state goes this route and submits its rules and plans to regulate CCRs to EPA for their approval, does this make it a Federally Enforceable Program if EPA approves as part of the State Solid Waste Management Plan?
- The ELGs are applicable to Electric Utilities and Independent Power Producers. However, the State NPDES Program Permit Writers will do BPJ analysis and most likely rely of the ELG for Steam Electric Generating Facilities.

The following 5 slides are provide for reference.

HALEY & ALDRICH

(www.haleyaldrich.com)

Report Entitled:

REGULATORY UPDATE: USEPA Issues Final Coal Combustion Residuals Rule

The next 5 slides were copied from this report and provide a good overview of the rule as of EPA's CCR rule.

Table 1: Summary of Regulatory Criteria

Category	Subtitle D – 40 CFR 257				
Applicability	40 CFR 257.53 Definitions: Coal combustion residuals (CCR) means fly ash, bottom ash, boiler slag, and flue gas desulfurization materials generated from burning coal for the purpose of generating electricity by electric utilities and independent power producers.				
	New Landfill/Lateral Expansion	New Impoundment/Lateral Expansion	Existing Landfill	Existing Impoundments	Regulatory Reference
Floodplains (a)	Shall not restrict the flow of base flood, reduce the temporary storage capacity of the floodplain, or result in washout of solid waste, so as to pose a hazard to human life, wildlife, or land or water resources	Shall not restrict the flow of base flood, reduce the temporary storage capacity of the floodplain, or result in washout of solid waste, so as to pose a hazard to human life, wildlife, or land or water resources	Shall not restrict the flow of base flood, reduce the temporary storage capacity of the floodplain, or result in washout of solid waste, so as to pose a hazard to human life, wildlife, or land or water resources	Shall not restrict the flow of base flood, reduce the temporary storage capacity of the floodplain, or result in washout of solid waste, so as to pose a hazard to human life, wildlife, or land or water resources	40 CFR 257.3-1 (a)
Endangered Species (a)	Shall not cause or contribute to the taking of any endangered or threatened species of plant, fish, or wildlife and Shall not result in destruction or adverse modification of their critical habitat	Shall not cause or contribute to the taking of any endangered or threatened species of plant, fish, or wildlife and shall not result in destruction or adverse modification of their critical habitat	Shall not cause or contribute to the taking of any endangered or threatened species of plant, fish, or wildlife and shall not result in destruction or adverse modification of their critical habitat	Shall not cause or contribute to the taking of any endangered or threatened species of plant, fish, or wildlife and shall not result in destruction or adverse modification of their critical habitat	40 CFR 257.3-2
Surface Water (a)	Shall not discharge pollutants or dredged or fill materials into waters of the US (including wetlands), or cause non-point source pollution	Shall not discharge pollutants or dredged or fill materials into waters of the US (including wetlands), or causes non-point source pollution	Shall not discharge pollutants or dredged or fill materials into waters of the US (including wetlands), or causes non-point source pollution	Shall not discharge pollutants or dredged or fill materials into waters of the US (including wetlands), or causes non-point source pollution	40 CFR 257.3-3 40 CFR 257.62
Placement Above the Uppermost Aquifer	Base located min of 5 feet above upper limit of uppermost aquifer, or demonstrate no intermittent, recurring, or sustained hydraulic connection between the base of the CCR unit and the uppermost aquifer due to normal fluctuations in groundwater elevations (including the seasonal high water table)	Base located min of 5 feet above upper limit of uppermost aquifer, or demonstrate no intermittent, recurring, or sustained hydraulic connection between the base of the CCR unit and the uppermost aquifer due to normal fluctuations in groundwater elevations (including the seasonal high water table)	N/A	Base located min of 5 feet above upper limit of uppermost aquifer, or demonstrate no intermittent, recurring, or sustained hydraulic connection between the base of the CCR unit and the uppermost aquifer due to normal fluctuations in groundwater elevations (including the seasonal high water table)	40 CFR 257.60
Wetlands	Must not be located in wetlands unless a demonstration is made pursuant to this section	Must not be located in wetlands unless a demonstration is made pursuant to this section	N/A	Must not be located in wetlands unless a demonstration is made pursuant to this section	40 CFR 257.61
Fault Areas	Must not be located within 200 feet of the outermost damage zone of a fault that has had displacement in Holocene time unless a demonstration is made pursuant to this section	Must not be located within 200 feet of the outermost damage zone of a fault that has had displacement in Holocene time unless a demonstration is made pursuant to this section	N/A	Must not be located within 200 feet of the outermost damage zone of a fault that has had displacement in Holocene time unless a demonstration is made pursuant to this section	40 CFR 257.62
Seismic Impact Zones	Must not be located within seismic impact zones unless a demonstration is made pursuant to this section	Must not be located within seismic impact zones unless a demonstration is made pursuant to this section	N/A	Must not be located within seismic impact zones unless a demonstration is made pursuant to this section	40 CFR 257.63
Unstable Areas	Must not be located in an unstable area unless a structural integrity demonstration is made pursuant to this section	Must not be located in an unstable area unless a structural integrity demonstration is made pursuant to this section	Must not be located in an unstable area unless a structural integrity demonstration is made pursuant to this section	Must not be located in an unstable area unless a structural integrity demonstration is made pursuant to this section	40 CFR 257.64
Composite Liner – Upper Component	Min. 30-mil geomembrane liner (GM) or 60-mil HDPE	Min. 30-mil geomembrane liner (GM) or 60-mil HDPE	N/A	If relocated from min. 30-mil geomembrane liner (GM) or 60-mil HDPE:	40 CFR 257.70 (b) 40 CFR 257.71 40 CFR 257.72
Composite Liner – Lower Component	2 ft. thick compacted soil with $k < 1 \times 10^{-7}$ cm/s, or equivalent alternative	2 ft. thick compacted soil with $k < 1 \times 10^{-7}$ cm/s, or equivalent alternative	N/A	If relocated from a 2 ft. thick compacted soil with $k < 1 \times 10^{-7}$ cm/s is required, or equivalent alternative	40 CFR 257.70 (b) 40 CFR 257.71 40 CFR 257.72
Composite Liner – Lower Component – equivalent Alternatives	An alternative material with $k < 1 \times 10^{-7}$ cm/s that is NOT a geomembrane	An alternative material with $k < 1 \times 10^{-7}$ cm/s that is NOT a geomembrane	N/A	An alternative material with $k < 1 \times 10^{-7}$ cm/s that is NOT a geomembrane	40 CFR 257.70 (c) 40 CFR 257.71 40 CFR 257.72

FINAL versus FEDERAL CCR REGULATIONS

Category	Subtitle D – 40 CFR 257				
Applicability	40 CFR 257.50 Definitions: Coal combustion residuals (CCR) means fly ash, bottom ash, boiler slag, and flue gas desulfurization materials generated from burning coal for the purpose of generating electricity by electric utilities and independent power producers.				
	New Landfill/Lateral Expansion	New Impoundment/Lateral Expansion	Existing Landfill	Existing Impoundments	Regulatory Reference
Leachate Collection and Removal System	< 30-cm (1 ft) depth of leachate over liner	N/A	N/A	N/A	40 CFR 257.70 (a)
Classified as High or Significant Hazard Potential	N/A	Emergency Action Plan required, with periodic assessments	N/A	Emergency Action Plan required, with periodic assessments	40 CFR 257.73 40 CFR 257.74
Air Criteria	Performance based with dust control plans, no numeric standard	Performance based with dust control plans, no numeric standard	Performance based with dust control plans, no numeric standard	Performance based with dust control plans, no numeric standard	40 CFR 257.80
Run-On Control	Prevent flow onto active portion of landfill during 24-hr, 25-yr storm	Inflow Design Flood Control System Plan (design flood based on hazard classification)	Prevent flow onto active portion of landfill during 24-hr, 25-yr storm	Inflow Design Flood Control System Plan (design flood based on hazard classification)	40 CFR 257.81 40 CFR 257.82
Run-Off Control	"Collect and control volume/flow from 24-hr, 25-yr storm	Inflow Design Flood Control System Plan (design flood based on hazard classification)	Collect and control volume/flow from 24-hr, 25-yr storm	Inflow Design Flood Control System Plan (design flood based on hazard classification)	40 CFR 257.81 40 CFR 257.82
Inspection Requirements	Inspections by a Qualified Person or Qualified Professional Engineer on a periodic basis as specified	Inspections by a Qualified Person or Qualified Professional Engineer on a periodic basis as specified	Inspections by a Qualified Person or Qualified Professional Engineer on a periodic basis as specified	Inspections by a Qualified Person or Qualified Professional Engineer on a periodic basis as specified	40 CFR 257.83 40 CFR 257.84
Final Cover Vegetative Layer	6" erosion/vegetative layer	6" erosion/vegetative layer	6" erosion/vegetative layer	6" erosion/vegetative layer	40 CFR 257.102 (d)(3)(i)(C) 40 CFR 257.102 (d)(3)(ii)(C)
Final Cover Infiltration Layer	18" infiltration layer	18" infiltration layer	18" infiltration layer	18" infiltration layer	40 CFR 257.102 (d)(3)(i)(B) 40 CFR 257.102 (d)(3)(ii)(B)
Final Cover Permeability	Permeability less than or equal to any bottom liner or natural subsoils or permeability < 1x10-5 cm/s whichever is less	Permeability less than or equal to any bottom liner or natural subsoils or permeability < 1x10-5 cm/s whichever is less	Permeability less than or equal to any bottom liner or natural subsoils or permeability < 1x10-5 cm/s whichever is less	Permeability less than or equal to any bottom liner or natural subsoils or permeability < 1x10-5 cm/s which-ever is less	40 CFR 257.102 (d)(3)(i)(B) 40 CFR 257.102 (d)(3)(ii)(A)
Post-Closure Care	30 yr	30 yr	30 yr	30 yr	40 CFR 257.104 (c)
Post-Closure Maintenance of Final Cover	Maintaining integrity and effectiveness including making repairs as necessary to correct effects of settlement, subsidence, erosion or other events and preventing run-on and run-off from eroding or otherwise damaging the final cover	Maintaining integrity and effectiveness including making repairs as necessary to correct effects of settlement, subsidence, erosion or other events and preventing run-on and run-off from eroding or otherwise damaging the final cover	Maintaining integrity and effectiveness including making repairs as necessary to correct effects of settlement, subsidence, erosion or other events and preventing run-on and run-off from eroding or otherwise damaging the final cover	Maintaining integrity and effectiveness including making repairs as necessary to correct effects of settlement, subsidence, erosion or other events and preventing run-on and run-off from eroding or otherwise damaging the final cover	40 CFR 257.104 (b)(1)
Post-Closure Maintenance of Leachate Collection System	Maintaining the system and continued moni-toring	N/A	Maintaining the system and continued moni-toring	N/A	40 CFR 257.104 (b)
Post-Closure Maintenance and Moni-toring of Groundwater System	Maintaining the system and continued moni-toring	Maintaining the system and continued monitoring	Maintaining the system and continued moni-toring	Maintaining the system and continued monitoring	40 CFR 257.104 (b)

Note: BOLD items in the table represent changes from the Proposed CCR Rule.
(a) – Requirements from existing 40 CFR Part 258, referenced but not changed in the Final CCR Rule.

Table 2: Summary of Groundwater Monitoring Requirements

		FINAL 2015 FEDERAL CCR REGULATIONS	
Category		**Subtitle D**	**Regulatory Reference**
Detection Monitoring Program	Groundwater Monitoring System – Existing CCR Landfills and Impoundments	1) Install groundwater monitoring system as described in 257.91, 2) develop groundwater sampling and analysis program, which includes selection of statistical procedures to be used for evaluating the groundwater monitoring data, 3) initiate detection monitoring which includes measuring water levels and collecting a minimum of eight independent samples from each upgradient and downgradient well and analyze for both Appendix III and Appendix IV constituents; and, 4) begin evaluating the groundwater monitoring data for statistically significant increases over background levels for Appendix III constituents	40 CFR 257.90 (b)
	Groundwater Monitoring System – New CCR Landfills and Impoundments and Lateral Extensions	Prior to receipt of CCR, 1) develop groundwater monitoring system and sampling and analysis program as above, 2) collect eight independent samples from each background well, and, 3) analyze each sample for Appendix III and Appendix IV constituents for the first six months	40 CFR 257.90 and 40 CFR 257.94 (b)
	Groundwater Monitoring System Certification	Existing CCR landfills and existing CCR surface impoundments must certify a groundwater monitoring system within 24 months of effective date (30 months from publication) and update operating record, then update website within 30 days after operating record update	40 CFR 257.90 (b)
	Upgradient Wells	One minimum	40 CFR 257.91 (c)
	Downgradient Wells	Three minimum (at waste boundary)	40 CFR 257.91 (c)
	Sampling and Analysis Documentation	Prepare sampling and analysis program documentation; place it in operating record and on publicly accessible website	40 CFR 257.93 (a)
	Appendix III Constituents	Boron, calcium, chloride, fluoride, pH, sulfate, TDS	40 CFR 257.94 (a), Appendix III
	Establish Background	For existing CCR landfills and surface impoundments: establish background for Appendix III & IV constituents; for new CCR landfills, new surface impoundments, and all lateral extensions, establish background concentration for both Appendix III and IV constituents	40 CFR 257.90 (b) 40 CFR 257.94 (b)
	Sampling	At least one sample from each background and downgradient well must be collected during each semi-annual sampling event	40 CFR 257.94 (c)
	Statistical Analysis	Conduct statistical analysis according to sampling & analysis program	40 CFR 257.93 (h)
	Violation Conditions	One or more Appendix III constituents detected at statistically significant level above background	40 CFR 257.94 (e)
	Violation Notification	Initiate assessment monitoring and place notification in operating record, post to website within 30 days of operating record entry, or demonstrate other source of contamination within 90 days	40 CFR 257.94 (e)(1&2), 257.105 (h), 257.106 (h), and 257.107 (h)
	Recordkeeping	Update operating record, and then post to website within 30 days	40 CFR 257.93 (f)
Assessment/ Compliance Monitoring Program	Appendix IV Constituents	Antimony, arsenic, barium, beryllium, cadmium, chromium, cobalt, fluoride, lead, lithium, mercury, molybdenum, selenium, thallium, radium 226 and 228 combined	40 CFR 257.95 (b), Appendix IV
	Initial Assessment Sampling	Minimum of one sample from each well within 90 days analyzed for Appendix IV constituents; background was established with initial certification per 40 CFR 257.94 (b)	40 CFR 257.95 (b)
	Sampling Notification	Place in operating record – which must then be posted to the website within 30 days – and the state notified when website is updated	40 CFR 257.95 (d)(1)
	Sampling – Continuing Action	Resample all wells within 90 days, and on at least a semi-annual basis thereafter, for Appendix III and Appendix IV constituents	40 CFR 257.95 (d)(1)

Category		Subtitle D	Regulatory Reference
		FINAL 2015 FEDERAL CCR REGULATIONS	
Assessment/ Compliance Monitoring Program	Establish Background	Background established when groundwater monitoring system was certified	40 CFR 257.94 (b)
	Establish GWPS	Establish groundwater protection standards (GWPS) for any Appendix IV constituents detected; these are the higher of the Maximum Contaminant Level (MCL), where available, or background	40 CFR 257.95 (h)
	Assessment Monitoring Closure	If constituents are below background for two consecutive events, return to detection monitoring	40 CFR 257.95 (c)
	Assessment Monitoring Continuation	If constituents are above background but below groundwater protection standard, continue assessment monitoring	40 CFR 257.95 (f)
	GWPS Exceedance During Assessment Monitoring	Characterize the nature and extent of the release and any relevant site conditions that may affect the remedy ultimately selected	40 CFR 257.95 (g)(1)
	Install Additional Wells	During assessment monitoring, install monitoring wells as needed to find extent of contamination, including at least one at the facility boundary in the direction of contaminant migration	40 CFR 257.95 (g)(1)
	Notification	During assessment monitoring, notify all property owners/residents determined to be affected by the contamination and place in operating record	40 CFR 257.95 (g)(2)
	GWPS Exceedance Notification and Corrective Action Initiation	Place notice in operating record and characterize. Begin assessment of corrective actions within 90 days – or demonstrate other source within 90 days	40 CFR 257.95 (g) and 257.105 (h), 257.106 (h), and 257.107 (h)
Corrective Action Program	Constituents/Sampling Frequency	During assessment of corrective measures, sample semi-annually (minimum) for constituents detected at statistically significant levels above background	40 CFR 257.96 (b) and 40 CFR 257.95
	Assessment of Corrective Measures	Analysis of effectiveness, performance, time, permitting, and cost of remedy options; assessment must be completed within 90 days	40 CFR 257.96 (a) and (c)
	Selection of Remedy	Select remedy that attains GWPS and prevents further contamination, and specify schedule for initiation and completion of remedial activities; make notifications	40 CFR 257.97
	Implement Remedy	Initiate remedial activities within 90 days of selecting a remedy	40 CFR 257.98 (a)
	Corrective Action Groundwater Monitoring Plan	Establish and implement (based on remedy schedule) corrective action monitoring plan that meets requirements of an assessment monitoring program and indicates effectiveness of remedy	40 CFR 257.98 (a)(1)
	Interim Measures	Take any interim measures to protect human health and environment, if required	40 CFR 257.98 (a)(3)
	Alternative Measures	If the selected remedy will not reach compliance, alternative methods must be implemented	40 CFR 257.98 (b)
	Completion of Remedy	Compliance demonstrated when Appendix IV constituents meet groundwater protection standards for 3 consecutive years	40 CFR 257.98 (c)(2)
	Notification	Update Operating Record, post Operating Record to the website within 30 days; notify State that website has been updated	40 CFR 257.98 (f), 257.105 (h), 257.106 (h), and 257.107 (h)

Table 3: Appendix III and IV Constituents and MCLs

CONSTITUENTS FOR DETECTION AND ASSESSMENT MONITORING UNDER THE NEW CCR RULE	
Constituent	**MCLs (a) (mg/L)**
Appendix III to Part 257 – Constituents for Detection Monitoring	
Boron	--
Calcium	--
Chloride	--
Fluoride	4
Sulfate	--
pH (std)	--
Total Dissolved Solids	--
Appendix IV to Part 257 – Constituents for Assessment Monitoring	
Antimony	0.006
Arsenic	0.01
Barium	2
Beryllium	0.004
Cadmium	0.005
Chromium	0.1 (b)
Cobalt	--
Fluoride	4
Lead	0.015 (c)
Lithium	--
Mercury	0.002 (d)
Molybdenum	--
Radium 226 and 228 combined	5 pCi/L
Selenium	0.05
Thallium	0.002

EPA obtained a Court Order in terms of a remand to add Boron MCLs to the list.

Notes:

CCR – Coal Combustion Residuals

MCL – Maximum Contaminant Level

mg/L – milligram/liter

pCi/L – picoCurie/liter

(a) – USEPA 2012 Edition of the Drinking Water Standards and Health Advisories, Spring 2012
http://water.epa.gov/drink/contaminants/index.cfm
Values in mg/L except where noted

(b) – Value for Total Chromium

(c) – Lead Treatment Technology Action Level is 0.015 mg/L

(d) – Value for Inorganic Mercury

Another Long-Term Issue To Monitor as the potential goes beyond hard-rock mining

- EPA Administrator, Gina McCarthy on December 1, 2016 sign the following proposed rule: Financial Responsibility Requirements under CERCLA § 108(b) for Classes of Facilities in the Hardrock Mining Industry.
- This proposed rule would create Part 320 in the CERCLA regulations at 40 CFR to require financial responsibility under CERCLA § 108(b), define requirements for demonstration of financial responsibility, define requirements for maintenance of financial responsibility instruments, and establish criteria for owners and operators to be released from financial responsibility requirements.

Why Monitor?

- The concept of long-term financial guarantees is part of the bonding program for coal mining dealing with the need to have financial guarantees in place with the regulatory agency to insure long-term water treatment on-top of reclamation bonds.
- This has the potential to be applied to landfills, impoundment, water cleanup and remediation projects, and to ultimate site restoration if Industrial Operations Cease.

Questions?