



Podcast Transcript

Episode 19: Follow up Q & A with Andy Bittner and J.R. Register on their webinar titled “US EPA Reconsiderations of CCR Regulations Impacting the Geosynthetics Industry.”

Our guests today are: Harold D. Register, Jr. (JR), of Consumers Energy in Jackson, Michigan and Andrew Bittner of Gradient Corporation in Boston, Massachusetts. JR is a Principal Engineer with Consumers Energy and has over 20 years of experience in the solid and hazardous waste management and remediation field. Andy Bittner is a Principal with Gradient and a licensed environmental engineer with over 20 years of experience specializing in the fate and transport of contaminants in the environment, groundwater and surface water modeling and corrective actions.

1. Is EPA expecting to review alternative liner evaluations? The CCR rule has required publication of documents, but EPA be hands off and the CCR rule relied on lawsuits for enforcement.

Answer: While the Final Rule - A Holistic Approach to Closure Part B has not been published as a final rule, US EPA proposed in the draft final rule a two-step process for the alternative liner demonstration. The first step would be an initial application submitted by the owner/operator to US EPA declaring intent to submit an alternative liner demonstration within 30 days of the final rule. At that time, US EPA would have 60-days from the time of receiving a complete application to determine if the facility is eligible to move to the second step which is preparation and submittal of the alternative liner demonstration. US EPA would ultimately determine whether the owner/operator has provided sufficient information to show “no reasonable probability” of impact from continued operation of the impoundment. This is anticipated to be presented in the form of groundwater monitoring data and sufficient site characterization to demonstrate the equivalency of a lined unit.

2. I believe the CCR rules resulted in more use of geosynthetics for closure of CCR facilities, so it was a good news for the industry providing these services. However, it was more expense to the utilities and consumers. If this is not true please provide your take on this.

Answer: The use of geosynthetics has increased due to the closure of CCR facilities, especially since long-term disposal facilities have utilized geosynthetics in components of the liner system and the final cover system. The incorporation of the geosynthetics has come at an increased price for closing CCR facilities. However, the cost of capping a CCR facility with a geomembrane still pales in comparison to the cost of excavating the CCR and redisposing it in a different location. Thus, to the extent that geosynthetics have increased the acceptance and reliability of capping a CCR facility in place, they have also provided value and cost-savings to both utilities and consumers.

3. Is Consumer Energy or any other utility you know pursuing CCR impoundment with an alternate closure? If yes, do you know what it consists of.

Answer: Consumers Energy does not intend to pursue closing any impoundments based on the alternate closure provisions of the Part A Rule since Consumers Energy already initiated closure (and in many cases completed physical closure) before the posting of the Part A Rule and any timelines associated with alternative closure.

US EPA has developed a public-facing website for CCR Part A Implementation where the public demonstrations documents are posted and summary information on the owner and status of review is tabulated. As of 10/09/2020, seven facilities have requested alternative closure under development of alternative capacity infeasibility (§ 257.103(f)(1)) and six facilities have requested alternative closure based on permanent cessation of a coal-fired boiler (§ 257.103(f)(2)).

EPA URL: <https://www.epa.gov/coalash/ccr-part-implementation>

4. I believe GCL would be considered alternate liner replacing clay and this could be demonstrated. What are your thoughts.

Answer: Current federal bottom liner standards require either a 30-mil geomembrane underlain by 2-foot of compacted soil with a hydraulic conductivity of less than 10^{-7} cm/s or a geomembrane with an underlying geocomposite layer that meets the same performance standards. Thus, the use of a GCL as a replacement for the underlying compacted soil layer is allowed - as long as you can demonstrate that it performs at the same level.

In the modeling that we did as part of the EPRI probabilistic evaluation of bottom liner systems, we looked at geomembranes underlain with a GCL layer. These type of liner systems generally performed among the best of the all the bottom liner systems that we evaluated.

5. Can you define in layman's terms what is meant by "closure?"

Answer: Closure is the physical work that is completed once a CCR unit ceases receipt of CCRs and executes the work according to the closure plan which may require constructing a final cover or excavating CCRs. This work is performed and certified in anticipation of the unit requiring long-term stewardship.

6. Have you considered the long term Salt concerns with clay and GCL in the lining of the sites?

Answer: The Electric Power Research Institute (EPRI) conducts research in numerous areas that are significant to the power generating industry. Similar to the Alternative Liner Demonstration publication discussed in the Webinar, EPRI has conducted research available in report that addresses evaluations and design considerations of GCLs with respect to CCR leachate.

Engineering Properties of Geosynthetic Clay Liners Permeated with Coal Combustion Product Leachate (EPRI Product ID# 3002003770, November 2014).

Hydraulic Conductivity of Compacted Soil Liners Permeated with Coal Combustion Product Leachates (EPRI Product ID# 3002008482, September 2016).

7. Does this updated closure EPA rule making also apply to other coal facilities such as coal waste and slurry impoundments?

Answer: The updated closure EPA rule applies to all *unlined* CCR surface impoundments that were subject to closure under the April 17, 2015 federal CCR Rule. The definition of a lined unit changed with the *USWAG Decision* and required that any CCR surface impoundment that didn't have a composite liner and at least two-feet of compacted clay was subject to closure under the rule.

8. Why is separation to saturated zone needed?

Answer: The separation between the bottom of an impoundment and groundwater is a key factor when evaluating risks. Similarly, there are some scenarios where impoundments are constructed into groundwater, such that the impoundment intersects the saturated zone. This is also a factor that must be considered when evaluating impacts to groundwater and when assessing risks.

For the analysis that we did, assessing concentrations in the saturated zone was the appropriate metric to use to evaluate the performance of bottom liner systems. The saturated zone is where the transport of CCR constituents primarily occurs and where risk to human health receptors may occur.

Additionally, our analysis of saturated zone concentrations under various bottom liner scenarios allowed us to evaluate conditions and assess risks in a way that was similar to how US EPA assessed risks in their 2014 national CCR risk assessment. It was important to quantify risk in the same terms that EPA did and to use similar metrics, in an apples to apples type fashion, in order to them to accept the results and use the analyses in their rulemaking.

9. Do the CCR rules apply to facilities that were closed before the CCR rules came out??

Answer: The final federal CCR Rule (FR, pp. 21343) preamble reads that EPA did not propose to require "closed" surface impoundments to "reclose"; therefore, the final rule does not impose any requirements on any CCR surface impoundments that have closed before the rule's effective date – i.e. those that no longer contain water and can no longer impound liquid.

10. Not a question, but a comment. As a geologist, I am glad to see that EPA is injecting some sanity by allowing the evaluation of natural materials and thoroughly understanding the geology/hydrogeology in order to assess potential liner performance. I do hope that this is not viewed as by doing a few more borings a significant amount of money can be saved. Such evaluations are not cheap, and we know that as you obtain more information you may not get answers you were hoping for.

Answer: It's a good point. And we certainly did not intend to imply that only a minimal amount of hydrogeological characterization work would be required in order to make a successful alternative liner demonstration. US EPA has in fact stated the opposite - that they will require a very high standard and a very thorough understanding of site conditions before approving an alternative liner demonstration.

11. Outside of the CCR impoundment world, we typically are hesitant to design composite liner systems for ponds as we are concerned about uplift acting below the geomembrane. When a single liner is not adequate, we lean towards a double liner with a geonet leak detection/drain in between. Do you have any thoughts on how to address this risk for composite lined CCR ponds?

Answer: In scenarios where geomembrane bottom liners are used in CCR surface impoundments, uplift is often not a concern because the weight of the saturated ash and ponded water overlying the geomembrane overcomes the uplift and holds the geomembrane in place. Similarly, even after closure there is enough CCR overlying the geomembrane that uplift is usually not a significant concern. In scenarios where a geomembrane is used and constructed into the saturated zone such that there is a positive pressure pushing up on the geomembrane from underneath and there is no overlying saturated ash to counteract these forces, then a ballast system, often of sand, would have to be used over the geomembrane in order to hold it in place.

12. How would you interpret the CCR rule regarding "cap system that is no less permeable than the bottom liner"? If you have a composite bottom liner, does the cap require a full composite system or would a single geomembrane be defensible since its permeability is the same as the geomembrane in the bottom composite liner.

Answer: Subtitle C of the Resource Conservation and Recovery Act (RCRA) codified standards for final cover systems that would "provide long-term minimization of migration of liquids through the closed land disposal unit and to have a permeability less than or equal to the permeability of the bottom liner system or natural subsoils present." (EPA, 1989, p. 22)

EPA has indicated that a two-component system, acting as a single design element, consisting of a geomembrane underlain by 24-inches of low permeability soil can be designed, constructed, and operated underneath a drainage layer to achieve a *technology* performance standard expected to maximize the removal of water from the overlying drainage layer and minimize infiltration of water into the waste.

Technical Guidance Document: Final Covers on Hazardous Waste Landfills and Surface Impoundments, (EPA 530-SW-89-047), US EPA, July 1989.