

**BEFORE THE ILLINOIS POLLUTION CONTROL BOARD**

In the Matter of:	)	
	)	
	)	
STANDARD FOR THE DISPOSAL OF	)	
COAL COMBUSTION RESIDUALS	)	PCB 2020-019
IN SURFACE IMPOUNDMENTS:	)	(Rulemaking - Land)
PROPOSED NEW 35 ILL. ADMIN.	)	
CODE 845	)	
	)	
	)	
	)	

**NOTICE OF ELECTRONIC FILING**

To: Attached Service List

PLEASE TAKE NOTICE that on September 24, 2020, I electronically filed with the Clerk of the Illinois Pollution Control Board (“Board”) the **PREFILED ANSWERS OF ANDREW REHN**, copies of which are served on you along with this notice.

Dated: September 24, 2020

Respectfully Submitted,



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**BEFORE THE ILLINOIS POLLUTION CONTROL BOARD**

IN THE MATTER OF: )  
 )  
 STANDARDS FOR THE DISPOSAL OF ) R 20-19  
 COAL COMBUSTION RESIDUALS IN ) (Rulemaking – Land)  
 SURFACE IMPOUNDMENTS: PROPOSED )  
 NEW 35 ILL. ADM. CODE 845 )  
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**PREFILED ANSWERS OF ANDREW REHN**

**Questions from the Illinois Pollution Control Board**

- 1. On page 6, you state that it is critical to have the safety factor reports to be reviewed by a third party. Please clarify whether you are referring to the initial and annual assessments of structural safety and safety factors required by Sections 845.450 and 845.460. If so, please explain why the proposed professional engineer’s certification required by those sections and subsequent review by the Agency is not sufficient to ensure accuracy of the calculations.**

Response: Those are the sections to which I am referring. My concern is that the agency is not reviewing the assumptions and calculations behind the safety factors, just the certifications (i.e. the sign-off). With only one party reviewing the actual assumptions and computations (that is, the professional engineer who did the work), there is a greater chance that the safety factors may not be accurate, either due to difference of opinion on assumptions, errors, or, possibly mal-intent. I specifically reviewed the safety factors that were released in federal CCR rule documents, so I was familiar enough with the reported values to illustrate the point that small changes in the calculated safety factor (perhaps due to a difference in assumptions) could result in different results. My understanding is that there is no second party reviewing the calculations and assumptions, and my recommendation is to build that requirement into the rules.

- 2. Also, on page 6, you state that while there were no surface impoundments that failed safety factors, there were a few that were close, and loss of life is likely if there is a failure at those sites. Please clarify whether you are recommending that the Board revise the safety factor. If so, provide specific revisions with technical justification.**

Response: I am not making comments on what value the minimum safety factors should be set.

- 3. Regarding closure by cap on page 7, you state that the rules must “establish comprehensive requirements for the alternatives analysis such that all the options are fully vetted from the outset.” Please comment on whether the proposed closure alternative analysis required under Section 845.710 is adequate. If not, propose additional requirements with justification.**

Response: The Closure Alternatives Analysis section could be improved by the following:

- 1) Explicitly requiring, in the case of removal, consideration of a variety of methods for the transportation of coal ash and separate consideration of each disposal location. An alternative analysis that includes only one transportation or disposal location is not considering all the options (or at least needs to explain why other options were not considered).
  - 2) Requiring, in the case of a cap (closure in place), that the owner or operator include the life-span of the closure mechanism, as well as what operation, maintenance, or other ongoing actions may be necessary to ensure the continued effectiveness of the cap or cap and other measures. This could be addressed more explicitly in 845.710(b)(1)(C). The assumed duration of ongoing operation, maintenance, and other human interventions should be also addressed in the modeling (i.e., the model report discussed in 845.710(d) should state how long a pump is assumed to run).
  - 3) Require that the alternatives analysis address what risks climate change might introduce for each alternative and include any associated risks in the modeling in 845.710(d) (i.e., How do changing flood magnitudes impact risk for coal ash impoundments along major rivers). Illinois is and will continue to experience the impacts of climate change, and we should be developing robust regulation that account for those changes now.
  - 4) Require that the alternatives analysis explicitly state if the coal ash will remain in contact (continually or intermittently) with water (this could be a factor in 845.710(b)(1).
4. **On pages 11-12, you state, “spatial map of the bottom elevation of the coal ash in impoundments should be included with the groundwater elevation measurements reported in hydrogeological investigations.” Please comment on whether such a requirement should be added to Section 845.620.**

Response: Yes, a requirement to provide a spatial map, similar to a groundwater elevation map, or at least a cross section showing the lowest points, should be required. There would be great value in being clear about where water is in relation to the coal ash. Groundwater elevation measurements are required in the proposed rules. I expect that estimating the bottom of the coal ash should be doable. For example, using only what is available to the public, I have been able to piece it together for some sites based on boring logs.

5. **Regarding ash ponds located in flood plains on page 12, you conclude that the risk of coal ash being exposed to water will increase. Please comment on whether you have any specific suggestions to strengthen the proposed flood plains related provisions under Section 845.110(b), 810.450, and 810.510.**

Response: I recommend the message in Mark Hutson’s testimony: coal ash ponds should not be left in floodplains. I have an additional concern that stems from my understanding that climate change in Illinois is anticipated to create more rainfall and bigger floods. Risks will likely grow

for coal ash that is left adjacent to major rivers across Illinois. Climate change is not considered in the regulation, and floodplains are one area where climate change can raise concerns.

**Questions from Illinois EPA**

**1. On page 8 of your testimony, you suggest that Part 845 should close what you call “knowledge gaps” and “allow the public to see a clear inventory of coal ash in Illinois.**

**a. How would you suggest that the Agency identify unknown surface impoundments for inventory?**

Response: I suggest the Agency find a regulatory way to make the polluter do the search. I imagine there are a number of ways to accomplish this, especially for a company with access to resources. For sites with known coal ash impoundments (such as the coal-fired power plants), you could require the owners to do an assessment of the property to the best of their ability using soil sampling, and then later hold them accountable if coal ash is found on their site that a reasonable search would have found. Owners can review their historical records to make educated guesses on where to search. The examples I gave (at Meredosia & Joppa) are coal ash ponds that are freely acknowledged in documents about which we (the public) know basically nothing.

**b. Are you aware of the Agency’s online, publicly accessible GIS mapping tool that shows the Agency’s inventory of SIs in the State of Illinois?**

Response: I now recall being notified of this map and am heartened to see it again! My coal ash map had very similar functionality. When my coal ash map was functioning, it contained additional information, such as links to documentation for the site, volumes of coal ash, and known groundwater violations in nearby wells. In order to better connect with the public, I would recommend building out the information sharing aspects of the map and promoting it on the agency’s Facebook page, perhaps using it to connect to public notices for any upcoming hearings. “CCR” is a term that the public is less familiar with than “coal ash,” and that might also help make the page more findable (Googling “Illinois EPA coal ash map” did not lead me to the map, but “Illinois EPA CCR Map” did).

**2. On page 10 of your testimony, you suggest that Part 845 should require industry to consider rail and barge as options when evaluating closure by removal.**

**a. Does Part 845 as proposed preclude transport of CCR by train or barge or limit transport of CCR to trucks?**

Response: By my reading, the proposed Part 845 does not preclude transport of CCR by train or barge, however, it also does not explicitly require the owner to assess it as an alternative. In my experience with closure plans proposed by industry in the past, this information is not presented fully. Many of my comments are focused on getting the most out of the initial closure plans

offered by industry, otherwise we will be spending months just getting answers to questions that should have been answered (and backed-up) in the initial proposal.

**b. How do you propose that CCR be transported to a train or barge from the SI?**

Response: I do not operate a coal-fired power plant or own a coal ash pond, so it is difficult to answer this question. It would be helpful for industry to address these sorts of questions when they present an alternatives analysis. One issue that I would like to see explored in this process is whether trucks, or perhaps conveyors, could transport the coal ash between the impoundments and loading facilities.

**c. What facilities or equipment would be necessary to load and unload a train car or barge?**

Response: I am aware that coal is often brought to coal-fired power plants via train or barge, and one issue that I would like to see explored in an alternatives analysis is whether they would be able to reverse that process. The maps I created often indicate rail spurs leading directly to power plants.

**d. What additional permits will be needed to stage CCR between immediate removal from SI to eventual loading of a train car or barge?**

Response: I do not know what existing permit programs would apply in this case.

**e. Would an additional permit process (such as for transfer stations) delay the already long-term nature of a removal process?**

Response: I do not know. That would be something that could be addressed in a complete alternatives analysis.

**f. Would an accident with a train car be more difficult to clean up than a traffic accident due to the potential location and road access limitations?**

Response: I do not know.

**g. Would an accident with a barge full of CCR be difficult and nearly impossible to clean up on one of our major rivers?**

Response: It could, yes. However, we have seen failures of coal ash ponds located along rivers at places like Kingston in Tennessee and the Dan River spill in North Carolina, so a similar risk is already present at ash ponds adjacent to waters where there are stability concerns.

**h. How will transportation by barge change during seasons of flood or drought?**

Response: I do not know. Flow in our major rivers are heavily regulated by locks and dams, but I am not familiar enough with barges to know how often the rivers are unnavigable.

**i. Are there landfills near railways and riverways that are permitted and willing to accept large amounts of CCR?**

Response: I do not know. This information is difficult to gather from the outside looking in. It would be helpful for the regulatory agency to address these questions, as I would hope they would be aware of the landfills in the state and what those landfills are permitted to accept. One of the attachments to my prefiled testimony (see Attachment 18 of my original prefiled testimony) shows the locations of some landfills near rail, and there appear to be many. See pages 1, 2, 6, 11, 19, and 21 for regional maps showing the relative location of rail and landfill at a high level. But again, I have used publicly available information to observe possible opportunities, but I cannot say whether those landfills are permitted to accept CCR. It is possible that such information would be available via FOIA. However, I just do not have the easy informational access that the agency or industry would have to assess this information, if they were required to do so.

**j. Would transport by rail or barge require another transfer station (& requisite permits) or staging area after its trip on the railway or river?**

Response: In the attachment to my prefiled testimony, I note that there are rail spurs spatially near many landfills. I am not sure if these spurs have staging areas near the landfills. Again, I am not the best-suited person to answer these questions as my access to the relevant information is limited. However, I presented the document to open a conversation and demonstrate that a complete exploration of transportation alternatives in the alternatives analysis is warranted.

**k. How do you propose that CCR be transported from the train or river to the receiving disposal facility?**

Response: I can only speculate. This would likely be handled by trucks, unless the staging area is close enough that conveyors of some kind could be used. This is an issue that is appropriately addressed in a site-specific alternatives analysis.

**l. Would the additional handling of CCR between truck to rail or barge and from rail to barge to truck to receiving facility increase the potential for accidents and exposure to dust and other hazards?**

Response: All activities carry risk that could be evaluated in an alternatives analysis.

**m. Would the additional handling of CCR between modes of transportation increase the locational exposure and potential accidents?**

Response: I think it would require a detailed analysis of each alternative to determine if risks would increase or not. Different risks would be present for different methods of closure.

- 3. Based on Page 11 of your testimony, you appear to be familiar with 35 Ill. Adm. Code Part 840 and its supporting documents, is that correct?**

Response: On Page 11 of my testimony, I discuss various reports on groundwater quality and monitoring at a number of coal ash sites in Illinois, including Vermilion, Hutsonville, Venice, and the Lincoln Stone Quarry. I am familiar with the reports that I mention in my testimony. Part 840 covers Hutsonville. I have reviewed the closure plan and closure reports at Hutsonville, but have not reviewed Part 840 in detail.

- 4. Are you aware that the CCR surface impoundment subject to Part 840 has saturated CCR at the base of the unit?**

Response: If this is referring to Ash Pond D at Hutsonville, then I am aware that the closure plan indicates the coal ash is “deep enough to have horizontal groundwater migration through the coal ash” as I quoted in my initial testimony.

- 5. Are you aware that documents submitted as part of the Part 840 rulemaking indicate that approximately a third of the CCR volume is at least periodically below the water table?**

Response: I have not located a document that states this so explicitly. The quote in my previous answer was the closest I found to an admission of CCR being saturated at Ash Pond D at Hutsonville. However, at least one of the wells on-site is continually above groundwater standards for pollutants commonly found in coal ash, so I would expect further documentation showing that the coal ash is wet.

- 6. Are you aware that the CCR surface impoundment subject to Part 840 is located within the National Flood Hazard Layer created by FEMA, and is as close as 100 feet from the edge of the Wabash River?**

Response: Yes, I submitted a map that indicates this as Attachment 37 to my prefiled testimony.

- 7. Are you aware that the Board found that the closure and post-closure care plans in conjunction with the groundwater corrective action required by Part 840 is protective of human health and the environment?**

Response: I am aware that the Board has approved Part 840. I am not aware of whether the Board made conclusions about the closure plan or if the Board has reviewed the subsequent groundwater monitoring results since the plan has been implemented.

#### Questions from Dynegy

- 1. During your time working at Prairie Rivers Network (“PRN”), has it promoted the regulation of CCR surface impoundments to members of the Illinois General Assembly?**



Response: Yes. Prairie Rivers Network has supported regulating coal ash impoundments for years and I have met with members of the assembly to discuss the harms of coal ash and the need for regulation.

- a. **If not, are you aware of other environmental groups, nonprofit organizations, or representatives thereof promoting the regulation of CCR surface impoundments to members of the Illinois General Assembly?**

Response: N/A.

2. **During your time working at PRN, has it advocated for an amendment to the Illinois Environmental Protection Act to regulate CCR surface impoundments?**

Response: Yes, we supported the Coal Ash Pollution Prevention Act as it was moving through the legislature last year.

- a. **If not, are you aware of other environmental groups, nonprofit organizations, or representatives thereof advocating for an amendment to the Illinois Environmental Protection Act to regulate CCR surface impoundments?**

Response: N/A.

- b. **Are you aware of Earthjustice advocating for such an amendment?**

Response: Yes, we worked with Earthjustice to support the Coal Ash Pollution Prevention Act.

3. **Did PRN recommend that the General Assembly mandate closure by removal when a CCR surface impoundment fails a location restriction or is located within a floodplain?**

Response: Yes, we supported Amendment 1 to Senate Bill 9.

- a. **If not, are you aware of other environmental groups, nonprofit organizations, or representatives thereof recommending that the General Assembly mandate closure by removal when a CCR surface impoundment fails a location restriction or is located within a floodplain?**

Response: N/A.

- b. **Are you aware of Earthjustice recommending such an amendment?**

Response: Yes, we worked with Earthjustice to support Amendment 1 to Senate Bill 9.

4. **During your time working at PRN, are you aware whether any bills or amendments were considered by the Illinois Legislature, or any of its members, that would have**

**explicitly required closure by removal when a CCR surface impoundment fails a location restriction or is located within a floodplain?**

Response: I am aware that Senator Bennett introduced Amendment 1 to Senate Bill 9, which called for closure by removal of CCR surface impoundments that fail location standards. Amendment 1 included a restriction on siting within a 100-year floodplain among the location standards.

- a. **For example, are you aware that Sen. Bennett filed such an amendment on or about March 15, 2019? Available at <https://www.ilga.gov/legislation/101/SB/10100SB0009sam001.htm>? (attached as Appendix A).**

Response: Yes.

- b. **Section 15(a) (Appendix A, p. 5-6) of that amendment would have required closure by removal for all CCR surface impoundments that did not meet the “location standards” described in that amendment, correct?**

Response: That is correct. If I recall, the opposition to the amendment was based on the argument that these details should be considered in rulemaking instead of the legislative process.

- c. **Section 5 (Appendix A, p. 2-3) defined “location standards” to include “a prohibition on being located, in whole or in part, in the 100-year floodplain,” correct?**

Response: Yes, that is correct.

5. **As you understand it, does the legislation ultimately passed by the Illinois General Assembly and signed by the Governor—P.A. 101-0171—explicitly require closure by removal when a CCR surface impoundment fails a location restriction or is located within a floodplain?**

Response: The legislation does not appear to explicitly require or forbid closure by removal when a CCR surface impoundment fails a location restriction or is located within a floodplain, but it does require consideration of closure by removal for all closing CCR surface impoundments. The legislation also makes clear that the federal CCR Rule is the floor for Illinois rules.

6. **Have you determined what it would cost to perform closure by removal for all CCR surface impoundments located within a floodplain, failing the aquifer separation location restriction, or where in intermittent, reoccurring or constant contact with groundwater?**

Response: I have not.

- a. If so, what are the costs?

Response: N/A.

7. **Have you determined whether there is sufficient existing operating landfill capacity to accommodate all of the CCR that would have to be excavated if removal is required for every CCR surface impoundment is located within a floodplain, failing the aquifer separation location restriction, or in intermittent, reoccurring or constant contact with groundwater?**

Response: No, I have not. I have made some loose estimates of coal ash volume in the state and searched for the reports of available landfill space based on a landfill space report put out by Illinois EPA. However, these were mostly “back of the envelope” estimates based on volume reporting from the CCR rule. I did not consider which landfills are or are not permitted to handle coal ash.

- a. If so, please describe your methodology?

Response: N/A.

8. **Have you determined how many trucks, trains, barges, etc. would be required to transport all of the ash removed if removal is required in every situation where a CCR surface impoundment is located within a floodplain, fails the aquifer separation location restriction, or where there is intermittent, reoccurring or constant contact with groundwater?**

Response: I have not.

### Questions from Midwest Generation

1. **Identify prior projects you have worked on for any federal or state environmental agency regarding the development of rules or regulations of general applicability that applied to coal combustion residuals (“CCR”) as that term is defined Section 3.142 of the Illinois Environmental Protection Act (“Act”).**

Response: I have not worked on any projects for state or federal environmental agencies.

2. **Identify any prior projects which you have worked on for an industrial facility that involved CCR as that term is defined in the Act and describe the work conducted.**

Response: I have not worked on any projects for an industrial facility.

3. **Identify the scope of any work you have been requested to perform on behalf of the clients you are representing here today, including any work related to any coal-fired generating stations.**

Response: I do not have clients and am not representing any clients.

**4. Are you a structural engineer? If so, please describe your training and experience.**

Response: I have not been employed as a structural engineer. I have a Master of Science in Civil Engineering and a Bachelor's in Civil and Environmental Engineering.

**5. Are you a licensed Professional Engineer (P.E.)? If so, in which state(s)? When did you receive your license(s)?**

Response: No. I have completed and passed the Fundamentals of Engineering exam, which is the first step towards becoming a P.E., but attaining a P.E. requires working under a P.E. (among other things), which I have not done.

**6. Are you aware that under the Illinois Professional Engineering Practice Act of 1989, Standards of Professional Conduct, a licensed P.E. must "at all times recognize that their primary obligation is to protect the life, health, property and welfare of the public"? 68 Ill. Adm. Code 1380.300(a)(1). See 68 Ill. Adm. Code 1380.300 attached as Appendix A.**

Response: Yes.

**7. Are you aware that under the Illinois Professional Engineering Practice Act of 1989, Standards of Professional Conduct, a licensed P.E. shall "approve and seal only designs prepared by them or under their direct supervision and found to be safe for the public health, property and welfare"? 68 Ill. Adm. Code 1380.300(a)(2). See Appendix A.**

Response: Yes.

**8. Are you aware that under the Illinois Professional Engineering Practice Act of 1989, Standards of Professional Conduct, a licensed P.E. shall "not affix their signature or seal to any plans or documents dealing with subject matter in which they lack competence, nor to any plan or document not prepared by them or under their direct supervisory control"? 68 Ill. Adm. Code 1380.300(b)(2). See Appendix A.**

Response: Yes.

**9. Are you aware that under the Illinois Professional Engineering Practice Act of 1989, Standards of Professional Conduct, a licensed P.E. must "be objective and truthful in all professional reports, statements or testimony"? 68 Ill. Adm. Code 1380.300(c)(1). See Appendix A.**

Response: Yes.

**10. Are you aware that violations of the Illinois Professional Engineering Practice Act of 1989 and its rules, including the Standards for Professional Conduct, would subject the licensed P.E. to disciplinary action including suspension or revocation of license and fines up to \$10,000 per violation? See 225 ILCS 325/24 attached as Appendix B.**

Response: Yes, that looks right.

**11. On p. 6 of your testimony you state, “We need more educated eyes on the reports to protect against such errors or inappropriate assumptions.”**

**a. Describe how a licensed Professional Engineer is not sufficiently educated to conduct a structural stability and safety factor assessment.**

Response: If the agency is not reviewing the calculations and assumptions that go into the structural stability analysis, then the only party that has evaluated those calculations and assumptions is the P.E. who made those calculations or assumptions (and their colleagues that may have participated in that work). Mistakes can be made. Intelligent, well-educated people make mistakes. At times, smart people disagree about which assumptions are proper. Sometimes, folks even do bad things, even if there is a risk of a \$10,000 fine. If there are not more parties checking the structural stability calculations, the risk of errors or miscalculations, whatever the reason, increases.

**b. In light of the Illinois Standards of Professional Conduct for Professional Engineers described in Questions 6-9, identify any inappropriate assumptions you have observed in structural stability and safety factor assessments.**

Response: I have not done this analysis. I understand enough about slope stability calculations to know that assumptions are made in order to make the calculation and can influence the outcome.

**c. In light of the Illinois Standards of Professional Conduct for Professional Engineers described in Questions 6-9, identify any errors you have observed in structural stability and safety factor assessments.**

Response: I have not reviewed stability and safety factor assessments for errors.

**12. On p. 5 of your testimony, you describe CCR landfills and areas of CCR impacting groundwater. Are you aware of Illinois Pollution Control Board (“Board”) Regulations, Part 620, Groundwater Quality?”**

Response: I am generally familiar with the regulation, and in particular, I am familiar with the numeric standards.

**a. Do you agree that Part 620 regulates the groundwater quality in Illinois, including at power generating stations? If not, explain why.**

Response: I do not make legal interpretations. If the groundwater standards do apply, they have not been enough to stop or solve groundwater pollution problems at coal ash ponds.

**13. On p. 9 of your testimony you discuss a public comment by Steven Campbell who evaluated the distance between the Waukegan ash ponds and the uppermost aquifer.**

**a. Do [sic] agree that Mr. Campbell did not evaluate whether there “will not be an intermittent, recurring, or sustained hydraulic connection” between the base of the Waukegan ash ponds and the uppermost aquifer? 40 CFR 257.60.**

Response: Mr. Campbell identifies that the “5-foot separation criteria has been violated during most of the period since mid-2011” (pp 9) and states that the groundwater is approximately one foot below the pond at present. He identifies the potential for distance between coal ash and groundwater to change and the need for ongoing reporting. He does not explicitly evaluate whether there “will not be an intermittent, recurring, or sustained hydraulic connection,” but he does call that statement in MWG’s certification to be disturbing (pp. 10).

**b. If you disagree, identify the section of his comment that makes such an evaluation.**

Response: See Response to 13(a).

**14. Do you agree that the Waukegan Station Placement Above the Uppermost Aquifer Location Restriction for the East and West Ash Basins, which is Attachment 17 to your testimony, states that the East and West Basins are so located “so that there will not be intermittent, recurring, or sustained hydraulic connection between any portion of the base of the Basins and the uppermost aquifer due to normal fluctuations in groundwater elevations”?**

Response: Attachment 17 states that on Page 2.

**15. Other than identification of the location of rail spurs at power stations and rail near landfills, what evaluations of using rail to transport ash from a CCR surface impoundment to a landfill have you conducted?**

Response: None, other than the maps.

**a. In your Attachment 18 “Map of Illinois Rail Relative to Coal Ash”, confirm that the landfills identified have a rail spur. If they do not, identify which landfills have a spur and which do not.**

Response: The attachment does not confirm which landfills have a rail spur.

**b. If not all of the landfills do not have a rail spur, explain how the CCR will be transferred from the rail to the landfill.**

Response: I am not sure I understand the question clearly. If I am being asked to speculate on how coal ash will go from a train to a landfill that does not have a rail spur, I guess they would either need to construct that rail capability, use trucks between the nearest drop-off point and the landfill, or find some other method to access the rail.

- c. In your evaluation of rail spurs, did you consider how the CCR will be transported from the CCR surface impoundment to the rail spur? If so, please describe your consideration including a description of the infrastructure requirements at a power station you considered.**

Response: The intent of including Attachment 18 in my testimony is to make the observation that rail infrastructure passes near coal ash sites and landfills. It is a first pass intended to demonstrate that these questions could use a more detailed analysis at each site when exploring closure alternatives. I did not do the complete alternatives analysis for each coal ash impoundment to determine how ash could be taken by rail.

- d. In your evaluation of the rail spurs, did you consider the additional transfer points of CCR for its removal (e.g. from the truck to train and then from train to truck and any infrastructure requirements for the transfer)? If so, what did you find?**

Response: The map in attachment 18 of my testimony does not address additional transfer points.

- 16. On p. 10 of your testimony, you state that many of the sites are along major rivers with significant barge traffic “indicating that transporting coal ash by barge is likely a reasonable alternative to consider.”**

- a. What evaluations of moving the CCR on barge did you conduct and what were those results?**

Response: I made no observation beyond noting that it would be worth further exploring in an alternatives analysis.

- b. Did you evaluate or identify the location of any landfills in Illinois or other states that are located near a major river accessible by barge? If so, identify the landfills with access to major rivers by barge.**

Response: I did not do this evaluation.

- c. If you conducted an evaluation on the availability to move CCR via a barge, did you consider how the CCR will be transported from the CCR surface impoundment to the barge? If so, please describe your consideration including a description of the infrastructure requirements at a power station you considered.**

Response: See above.

- d. If you conducted an evaluation on the availability to move CCR via a barge, did you consider the additional transfer points of CCR for its removal (e.g. from the truck to barge and then from barge to truck and any infrastructure requirements for the transfer)? If so, what was your conclusion?**

Response: See above.

- e. As part of your evaluation of the availability of the use of barges to move the CCR, did you evaluate any permits that may be required to be obtained? If so, what were the results?**

Response: See above.

**17. Do you agree that much of the CCR that you suggest should be removed from a CCR surface impoundment will likely be placed in a landfill at different location?**

Response: If CCR is removed from impoundments, it will most likely be disposed of in landfills. It is possible that some may be beneficially re-used, but I am unable to assess that with the information available to me. Ideally, these landfills would be constructed on the property in instances where there is space to do so and that meet location restrictions. If not, the CCR will likely go to other landfills.

- a. If not, identify where you believe the CCR will be disposed, and provide your basis, including any studies, you rely upon.**

Response: See Response to MWG question 17.

- i. Provide the estimated volume of CCR to be disposed in a landfill and the estimated volume for disposal at the location(s) you identify in answer to Question 17.a. and provide your basis, including any studies or data, you rely upon.**

Response: I did not estimate this volume that will be disposed in a landfill.

- b. Have you conducted an evaluation of the existing landfill capacity available in Illinois? If so, describe your evaluation and your results.**

Response: No. See Response to Dynege question 7.

- c. Have you conducted an evaluation of the existing landfill capacity available in states neighboring Illinois? If so, identify the states, describe your evaluation, and your results.**

Response: No, I have not looked at landfill capacity in neighboring states.



- d. Assuming there is insufficient existing landfill capacity, are you aware of the process and time required for siting and permitting a new location for a landfill?**

Response: I am not familiar with the permitting process for a new landfill.

- i. If you are aware, what is your understanding of the landfill siting process in Illinois?**

Response: N/A.

- ii. What is your estimate of the time required for siting and permitting a new landfill in Illinois?**

Response: I am not familiar with the process.

- iii. What is your estimate of the time required for the construction of a landfill and approvals prior to getting an operational permit issued?**

Response: I am not familiar with the process.

**18. On p. 11 of your testimony, you refer to the pumps operated at the Lincoln Stone Quarry.**

- a. Are you aware that the Lincoln Stone Quarry is a monofill landfill permitted by Illinois EPA pursuant to Permit No. 1994-241-LFM?**

Response: I understand that the Lincoln Stone Quarry has been referred to as a landfill at one time, but have not looked into the certifications. I have seen Midwest Generation's filing to the Board on February 19, 2019, in R2019-01, in which Midwest Generation states that the Lincoln Stone Quarry is a CCR Surface Impoundment under the federal coal ash rule.<sup>1</sup>

- b. Are you aware of the 2013 Groundwater Impact Assessment ("GIA") prepared by KPRG and Associates, Inc. and Geo-Hydro, Inc. and its conclusions, including that migration from the Lincoln Stone Quarry under the natural hydraulic gradients precludes migration away from the Lincoln Stone Quarry, except to the north and west?**

Response: I am not aware of the study or its conclusions. I do not know whether the study includes the conclusion referenced in this question or whether, if it does, that conclusion is correct.

- c. Are you aware that the GIA concluded that outward gradient to the southeast from the Lincoln Stone Quarry exists only at depth due to**

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<sup>1</sup> See Petition of Midwest Generation for an Adjusted Standard from Portions of 35 Ill. Admin. Code Part 811, IPCB AS 19-1, (Feb. 5, 2019) at 3 ("Because the Main Quarry is a "CCR Impoundment" as defined in the Federal CCR rules, the Main Quarry may be closed...") (attached hereto, without exhibits, as Attachment 1).

**depressurization by dewatering at the nearby Laraway Quarry which is to the southeast?**

Response: I am not aware of the study or its conclusions. I do not know whether the study includes the conclusion referenced in this question or whether, if it does, that conclusion is correct.

**d. Are you aware that the GIA concluded that there were no known receptors between the Lincoln Stone Quarry and the Laraway Quarry to the southeast?**

Response: I am not aware of the study or its conclusions. I do not know whether the study includes the conclusion referenced in this question or whether, if it does, the conclusions are correct.

**e. Are you aware the GIA concluded that the gradient reversal to the southeast is an anomaly and is addressed by the extraction pumps operating at the Lincoln Stone Quarry?**

Response: I am not aware of the study or its conclusions. I do not know whether the study includes the conclusion referenced in this question or whether, if it does, the conclusions are correct.

**f. Are you aware that when the Laraway Quarry ceases operations, including ceasing dewatering its property, the groundwater flow will revert back to its natural direction?**

Response: This seems speculative, even assuming all other conditions remain the same (which is far from certain).

**g. Are you aware that once the Laraway Quarry ceases operations and the groundwater flow reverts back to its natural direction, the extraction pumps will likely no longer be necessary?**

Response: This seems speculative, even assuming all other conditions remain the same (which is far from certain).

**h. Are you aware that based in part upon the GIA, the Illinois EPA approved the closure in place plan for the Lincoln Stone Quarry?**

Response: I am not familiar with what may have been approved for the Lincoln Stone Quarry or, if a closure plan was approved, on what basis it was approved. I also question whether any previously approved closure plan is still valid given the Coal Ash Pollution Prevention Act and the agency's inclusion of the Lincoln Stone Quarry in the list of CCR surface impoundments that it provided in the Statement of Reasons for this rule.

**Questions from Springfield City Water, Light, and Power**

- 1. Have you been to the site where the Dallman and Lakeside Ash Ponds are located in Springfield? If so, when and where?**

Response: I have not been to the ash ponds. I have driven by the ash ponds on the road over the dam and looked down on the ash ponds from a nearby tall building.

- 2. Describe in detail the steps used to create the map in Attachment 34 of the Dallman and Lakeside Ash ponds with citations to sources so that it can be recreated by someone else.**

Response: The map was made using ArcGIS. The impoundment shapefiles were drawn manually, tracing impoundments identified in one or more documents about the Dallman ash pond. The satellite images are the default world imagery on ArcGIS. The FEMA 100-year floodplain and the water lines are both from FEMA's National Flood Hazard Layer (<https://www.fema.gov/flood-maps/tools-resources/flood-map-products/national-flood-hazard-layer>), accessible online and through ArcGIS.

- 3. You state that you were "not able to find FEMA 100-year flood data for every coal ash site in Illinois" (page 12)? Why? How did you decide which facility maps were included in your testimony?**

Response: I was not able to find the FEMA flood layer for all areas. It seems that it was not available for every county. I was not able to determine why some counties were available and some were not available. I included in the testimony every coal ash pond that had an available FEMA floodplain overlapping the floodplain.

- 4. What size flood is the map in Attachment 34 to your testimony showing? How many hours or days does that size flood represent? How many inches of rain?**

Response: The data I used in my map was created by the Federal Emergency Management Agency (FEMA). My understanding is that the 100-year flood is the flood that has a 1% chance of happening in any given year. I do not have a further understanding of how FEMA determined the flood areas used in their maps.

- 5. Is it your testimony that the Dallman and Lakeside Ash Ponds would be underwater during a 100-year flood? Is it your testimony that Interstate 55 and portions of East Lake Shore Drive at the Spaulding Dam would be underwater in a 100-year flood?**

Response: I do not have any knowledge of flooding at Dallman outside of the maps that I have presented.

- a. What is your opinion based on other than the map you have drawn?**

Response: Just the maps.

**b. Are there any photos or satellite images that support your conclusion?**

Response: I have not searched for any photos or satellite images to support the FEMA maps.

**c. Are you aware of a flood of record when any of these areas were under water?**

Response: I have not looked into the floods of record at this site.

**6. Do you agree that the legislature intended to establish a requirement for a closure alternatives analysis that must be reviewed by the Illinois EPA on a case-by-case basis?**

Response: Yes, I agree that the intent of the legislature is to look at each individual site to evaluate whether the site meets, or does not meet, applicable standards and what the site must do to achieve those standards. This is why the alternatives analysis is so important – understanding the detailed options at each site and determining which of those options meets the standards.

**7. Do you agree that the legislature chose not to regulate landfills in the Coal Ash Pollution Prevention Act [P.A. 101-171]?**

Response: Not including something in the Act is not the same as choosing not to regulate it. I do not believe there was a vote on a bill which regulated coal ash landfills nor any bill that prohibited such regulations. The legislature made it clear that the federal CCR Rule is the floor.

**8. If the Board accepts your recommendation to include landfills in this rulemaking at Second Notice, how will a facility that only uses dry ash handling and a landfill receive notice that this rulemaking would be applicable to them?**

Response: I do not discuss how the Board should run the rulemaking in my testimony (a search of my testimony for “Second Notice” returns zero results). I do recommend that the Board should include additional issues in their rulemaking. Based on the questions I have received, I believe that nearly all owners of power plants are already represented in the rulemaking, so there may not be an issue here if the Board decides to take on the landfills at power plants. Additionally, I assume power plant owners know which landfills they send coal ash to, so it would seem relatively easy to make sure relevant landfills are informed, even if off-site.

**9. You testify on page 10 that 13 power plants “all have rail spurs located on the property (in most cases) or less than a mile way [sic] (in a few cases).” Which statement applies to the Dallman and Lakeside ash pond site?**

Response: The map indicates that, based on the data I used to create the map, there is rail less than a mile away at Dallman. There is a scale on the Dallman image in the bottom left (which could have certainly been made clearer). See the following question for more information regarding the map.

**10. Who developed the information in Attachment 18? When was it developed?**

Response: I put together the maps in attachment 18. I made the maps in May this year. The impoundment shapefiles were drawn manually, tracing impoundments identified in one or more documents. I used data that is available through ArcGIS's online database for the rail and landfill locations. The rail data can be found with a search (in ArcGIS) for 'il railroads'. The layer (<http://services2.arcgis.com/aIrBD8yn1TDTEXoz/arcgis/rest/services/RailRoads/FeatureServer>) is credited to Illinois Department of Transportation and is owned by IDOTAdmin. The description says the file was last updated on 9/19/2019. The landfill data is from the Illinois EPA geospatial services layers, specifically the Environmental/IllinoisLandfills layer (see <http://geoservices.epa.illinois.gov/arcgis/rest/services/Environmental/IllinoisLandfills/MapServer>).

- a. Is it your testimony that the Dallman and Lakeside ash ponds have access to rail?**

Response: No. I put together the map using publicly available data to gain a better understanding of where rail is in relation to coal ash impoundments and power plants. The exact details at each individual site cannot be inferred from the map alone.

- b. Do you believe that the Dallman power plant has access to rail?**

Response: I do not know if the Dallman power plant has access to rail.

- c. Do you have any knowledge of whether the rail line you identify in Springfield on Attachment 18 has been maintained?**

Response: No.

- d. Do you agree that this abandoned rail spur passed through and terminates in a residential neighborhood that is identified by Illinois EPA as an area of environmental justice concern?**

Response: I do not know. I hope that this information is captured in an alternatives analysis that considers all transportation alternatives.

- e. Are you aware of whether there is a functioning rail bridge across Interstate 55 at this location?**

Response: No.

- f. Have you confirmed whether any of the active, permitting landfills in Illinois identified by blue square in Attachment 18 would be able to accept disposal of coal ash via rail?**

Response: No.

- g. Have you determined which of these landfills are able and willing to accept CCR and in what quantities?**

Response: No.

- h. Of the landfills able and willing to accept CCR, have you determined how many are located in areas of environmental justice?**

Response: No. This is a concern and one that I hope would be assessed in an alternative analysis.

- i. Of the landfills able and willing to accept CCR, have you evaluated how many are located in unstable areas or other areas not meeting the location restrictions identified for impoundments in Part 845?**

Response: No.

- j. What impact would widespread landfilling of CCR material in Illinois have on the costs paid by municipalities for disposal at the same landfills?**

Response: I do not know.

**11. You testify on Page 6 that “industry reports I reviewed showed ash ponds at...Dallman...to be within 10% of the minimum required safety factor for one or more loading conditions.”**

- a. Are you referring to the Dallman Ash Pond in this statement?**

Response: No, I am referring to the Lakeside Ash Pond, where the safety factor documents posted by CWLP show that the long-term loading condition safety factor is 1.532 (within 10% of the required 1.5). I used “Dallman” to refer to the entire site, as the power plant is often called the Dallman Power Station.

- b. Do you agree that this safety factor is already included in these calculations to address this concern?**

Response: The question is unclear, but I think that my concerns regarding whether or not an impoundment meets a safety factor are valid. If an impoundment does not meet a safety factor, that is a reason for concern.

- c. Do you agree that the Dallman and Lakeside Ash Ponds analyzed under worst case conditions of the ash and pool elevation matching the top of the embankment? If you disagree, explain why.**

Response: The question is unclear. I assume you are asking if "... the Dallman and Lakeside Ash Ponds [were] analyzed under..." If so, I do not have an opinion. In my analysis, I simply compared numbers, taking the safety factors provided in CWLP's posted safety factor documentation at face value and comparing them to the required minimums.

- d. Do you agree that safety factors for the Dallman and Lakeside Ash ponds could only increase as they are dewatered and closed? If you disagree, explain the basis for your disagreement.**

Response: I have no opinion.

- 12. You have included the updated version of Bulletin 70 from 2019 as Attachment 41 to your testimony. Have the 1 Hour, 100 Year Storm values for the southern half of Illinois actually decreased slightly since the 1989 edition?**

Response: The authors of the Bulletin 70 Update note on page 39 that: "the results of this study generally show increasing precipitation amounts at selected frequencies for most of the sections with some relatively smaller decreases in the southern and western sections of Illinois. The present study shows consistent increases compared with NOAA Atlas 14 (Bonnin et al., 2006) and better reflects the current risk of heavier precipitation events."

- 13. On pages 11-12 you testify that "A spatial map of the bottom elevation of the coal ash in impoundments should be included with the groundwater elevation measurements reported in the hydrogeological investigations." Explain what you mean by this type of "spatial map"?**

Response: I am describing something similar to a groundwater table elevation map which shows the measured groundwater elevations at various points in space. This map would show the bottom elevation of coal ash at various points on a map.

Signed,



Date: September 24, 2020

**CERTIFICATE OF SERVICE**

The undersigned, Jennifer Cassel, an attorney, certifies that I have served by email the Clerk and by email the individuals with email addresses named on the Service List provided on the Board's website, available at <https://pcb.illinois.gov/Cases/GetCaseDetailsById?caseId=16858>, a true and correct copy of the **PREFILED ANSWERS OF ANDREW REHN**, before 5 p.m. Central Time on September 24, 2020. The number of pages in the email transmission is 54 pages.

Dated: September 24, 2020

Respectfully Submitted,

/s/ Jennifer Cassel

Jennifer Cassel (IL Bar No. 6296047)

Earthjustice

311 S. Wacker Dr., Suite 1400

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**The following is an attachment to the prefiled answers  
of Andrew Rehn.**

**ATTACHMENT 1**

BEFORE THE ILLINOIS POLLUTION CONTROL BOARD

IN THE MATTER OF:

PETITION OF MIDWEST GENERATION  
FOR AN ADJUSTED  
STANDARD FROM 35 ILL. ADM. CODE  
PARTS 811 and 814

(Adjusted Standard-RCRA)

NOTICE OF FILING

To: Pollution Control Board, Attn: Clerk  
100 West Randolph Street  
James R. Thompson Center, Suite 11-500  
Chicago, IL 60601-3218

Division of Legal Counsel  
Illinois Environmental Protection Agency  
1021 N. Grand Avenue East  
P.O. Box 19276  
Springfield, IL 62794-9276

PLEASE TAKE NOTICE that I have today filed with the Office of the Clerk of the Pollution Control Board the attached Petition of Midwest Generation, LLC for Adjusted Standard from under 35 Ill. Adm. Code 811 and 814, the Appearances of Kristen L. Gale and Susan M. Franzetti, and a Certificate of Service, a copy of which is herewith served upon you.

  
\_\_\_\_\_  
Kristen L. Gale

Date: Feb 5, 2019


Kristen L. Gale  
Susan M. Franzetti  
Nijman Franzetti LLP  
10 S. LaSalle Street, Suite 3600  
Chicago, IL 60603  
312 251 5255

CERTIFICATE OF SERVICE

I, the undersigned, certify that I have served the attached Petition for Adjusted Standard, and the  
Appearances of Kristen L. Gale and Susan M. Franzetti, by electronically filing with the Clerk  
and by first class mail upon IEPA:

Pollution Control Board, Attn: Clerk  
100 West Randolph Street  
James R. Thompson Center, Suite 11-500  
Chicago, IL 60601-3218

Division of Legal Counsel  
Illinois Environmental Protection Agency  
1021 N. Grand Avenue East  
P.O. Box 19276  
Springfield, IL 62794-9276

  
\_\_\_\_\_  
Kristen L. Gale

Date: Feb 5, 2019

Kristen L. Gale  
Susan M. Franzetti  
Nijman Franzetti LLP  
10 S. LaSalle Street, Suite 3600  
Chicago, Il 60603  
312 251 5255

BEFORE THE ILLINOIS POLLUTION CONTROL BOARD

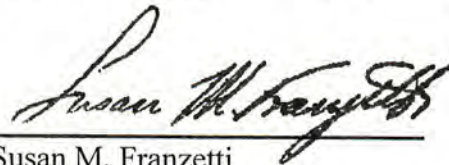
IN THE MATTER OF:

PETITION OF MIDWEST GENERATION  
FOR AN ADJUSTED  
STANDARD FROM 35 ILL. ADM. CODE  
PARTS 811 and 814

(Adjusted Standard-RCRA)

APPEARANCE

The undersigned, as one of its attorneys, hereby enters her appearance on behalf of  
Midwest Generation, LLC.



Susan M. Franzetti  
Attorney  
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10 S. LaSalle Street, Suite 3600  
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(312) 251-5590  
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BEFORE THE ILLINOIS POLLUTION CONTROL BOARD

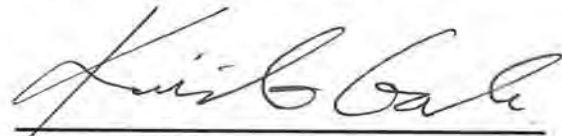
IN THE MATTER OF:

PETITION OF MIDWEST GENERATION  
FOR AN ADJUSTED  
STANDARD FROM 35 ILL. ADM. CODE  
PARTS 811 and 814

(Adjusted Standard-RCRA)

APPEARANCE

The undersigned, as one of its attorneys, hereby enters her appearance on behalf of  
Midwest Generation, LLC.



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**BEFORE THE ILLINOIS POLLUTION CONTROL BOARD**

**IN THE MATTER OF:**

**PETITION OF MIDWEST GENERATION  
FOR AN ADJUSTED  
STANDARD FROM 35 ILL. ADM. CODE  
PARTS 811 and 814**

**AS 19-  
(Adjusted Standard-RCRA)**

**MIDWEST GENERATION, LLC'S ADJUSTED STANDARD PETITION**

Midwest Generation, LLC ("MWGen"), by its undersigned counsel, requests a revision to its existing adjusted standard ("AS 96-9"), attached as Exhibit 1, for the Joliet/Lincoln Quarry Site ("Quarry" or the "Site"). The requested revision applies only to Condition 7(c) of AS 96-9.<sup>1</sup>

In 1996, the Board granted an adjusted standard for the Quarry from the generally applicable standards due to its unique operations and disposal practices. Currently, Condition 7 of AS 96-9 describes two methods of final cover and the type of final cover depending on the level of settled ash at the time of the closure of the Main Quarry.<sup>2</sup> MWGen is preparing for the eventual closure of the Main Quarry and there is new technology available for a dry closure final cover. Accordingly, MWGen requests that the Board issue a new adjusted standard that revises Condition 7(c) to allow the use of this new technology if MWGen closes the Quarry through dry closure. The new technology, known by the commercial name "ClosureTurf", employs a low permeability geosynthetic membrane and a synthetic turf as the final cover system. The proposed revised Condition 7(c) does not alter the previous substance or findings of the Pollution Control Board

<sup>1</sup> On December 7, 2000, the Board granted Commonwealth Edison's and MWGen's motion to reopen this docket and substituted the name of Midwest Generation, L.L.C. for Commonwealth Edison Company in its August 15, 1996 order. *In re Petition of Commonwealth Edison Company for an Adjusted Standard from 35 Ill. Adm. Code Parts 811 and 814*, AS 96-9, (December 7, 2000).

<sup>2</sup> The Quarry is comprised of three units: the Main Quarry, the North Quarry, and the West Filled Area. (Ex. 1, Order, p. 2). The West Fill Area at the Quarry is closed and has been leveled and vegetated. *Id.* The North Main Quarry does not receive ash, and instead acts as the settling pond for the Main Quarry. *Id.* In this Petition, MWGen is requesting authorization for the use of ClosureTurf only for the Main Quarry.

(“Board”), is supported by the Board’s opinion in In re Petition of Commonwealth Edison Company for an Adjusted Standard from 35 Ill. Adm. Code Parts 811 and 814, (Aug. 15, 1996), AS 96-9, and gives MWGen the ability to use an alternative and better final cover system for the dry closure of the Quarry. (Ex. 1). All of the remaining terms and conditions of AS 96-9 would remain unchanged.

This Petition sets forth the factual and legal bases for MWGen’s request. In further support of this Petition, MWGen submits affidavits of Richard Gnat (KPRG and Associates, Inc.) and William Naglosky (Midwest Generation, LLC), attached as Exhibits 2 and 3 respectively. Additionally, Mr. Gnat has directed and participated in the preparation of the Technical Memorandum in Support of this Petition (“Technical Memorandum”), attached as Exhibit 4. The Technical Memorandum explains in greater detail the specific technical benefits of the “ClosureTurf” technology, and also describes its use at other landfills throughout the United States, including an Illinois impoundment.

## **I. Summary**

On Aug. 15, 1996, the Board granted the prior owner of the Quarry an adjusted standard from certain of the operating and closure requirements of 35 Ill. Adm. Code 811 and 814 due to the unique nature of the Quarry (“Adjusted Standard” or “Order” attached here as Exhibit 1). Condition 7 of the Adjusted Standard provided for two methods for the Main Quarry’s closure. The two methods were either wet closure for which no final cover was required or, dry closure by installation a two-stage cover system consisting of two feet of soil having a hydraulic conductivity of  $1 \times 10^{-7}$  cm/sec overlain by four inches of top soil. (Ex. 1, Order, Condition 7, pp. 22-23).

In 2015, the U.S.EPA promulgated the Coal Combustion Residual (“CCR”) Rules, 40 CFR 257. Under the CCR rule, as it is currently drafted, all CCR impoundments are to be closed via dry closure.<sup>3</sup> Because the Main Quarry is a “CCR Impoundment” as defined in the Federal CCR rules, the Main Quarry may be closed via dry closure with a two-stage cover system. To address the eventual closure of the Main Quarry, MWGen considered technologies for final cover systems that were not available when the Board approved Condition 7(c) in AS 96-9. MWGen identified a new final cover two-stage system called “ClosureTurf”. ClosureTurf is a new proprietary cover system, that is better technology than what was available in 1996. It also fully complies with the performance criteria of the Final Cover requirements under 35 Ill. Adm. Code 811.314. ClosureTurf has been used in at least seventeen states as a final cover system for impoundment and landfills, including a CCR surface impoundment in Meredosia, IL (Ex. 4, Technical Memorandum, at p. 1). As required by 35 Ill. Adm. Code 811.314(b)(3)(B)(i), the ClosureTurf system has a low permeability layer of geomembrane that has a permeability of  $1 \times 10^{-13}$  cm/sec, which is less permeable than the regulatory requirement of  $1 \times 10^{-7}$  under 35 Ill. Adm. Code 811.314(b)(3)(A). Section 811.314(c) of the landfill final cover regulations provides for a final protective layer that consists of 3 feet of soil, which overlays the underlying low permeability layer. The ClosureTurf system includes a final protective layer that is not soil. It consists of synthetic turf and sand, which provides equal protection of the underlying low permeability layer,

<sup>3</sup> The CCR rule is the subject of litigation filed in the D.C. Circuit, and the Court has already vacated parts of the CCR Rule. *Utility Solid Waste Activities Group (USWAG) et al. v. EPA*, No. 15-1219 (D.C. Cir.). In part in response to the litigation, in March 2018, U.S.EPA proposed more than a dozen changes to the 2015 CCR Rules. On July 17, 2018, the U.S.EPA Administrator signed a final rule revising certain elements of the CCR Rule, based on the changes proposed in March 2018. 83 FR 36435. The July 2018 changes are referred to as the “Phase 1, Part 1 Rule.” The elements that were not contained in the final Phase 1, Part 1 Rule will be addressed in the final Phase 1, Part 2 Rule. According to the Phase 1, Part 1 Rule preamble, the U.S.EPA intends to finalize the Phase 1, Part 2 Rule by June 2019. 83 FR 36437. Additionally, U.S.EPA will propose the “Phase 2” changes to the CCR rule, by September 20, 2019, and finalize the Phase 2 changes by December 2019. Accordingly, the 2015 CCR rules and amended 2018 rules will have significant changes, including to its timelines and potentially also to the final closure requirements.

while also providing protection from erosion and freezing, as required by 35 Ill. Adm. Code 811.314(c). Accordingly, MWGen requests that the Board revise Condition 7(c) to provide that, if MWGen pursues dry closure, MWGen may close the Main Quarry using the ClosureTurf two-stage system, which has a low permeability layer compliant with 35 Ill. Adm. Code 811.314(b), and has a final protective layer that is different from, but meets or exceeds the performance requirements of, the soil cover material in 35 Ill. Adm. Code 811.314(c) and AS 96-9.

## **II. Background**

On Aug. 15, 1996, the Board granted an adjusted standard from 35 Ill. Adm. Code 814.302(b)(1), 811.319(a)(2), 811.319(a)(3), 811.318(b)(5), 811.320(c), and 811.314. (Ex. 1, Order). The Board found that the Quarry configuration, including the differences in the flow regime, mode of operations, and waste characteristics were substantially different from the factors the Board relied on in adopting the general regulations for municipal landfills. *Id.* MWGen is not requesting that the entire adjusted standard granted in 1996 be revisited and revised. Rather, MWGen is only requesting that the Board modify Condition 7(c) to allow the use of improved final cover technology that is currently available..

### **A. The Board's AS 96-9 Findings and Conclusions Regarding the Main Quarry are Still Applicable.**

The analysis and conclusions in the AS 96-9 order for the adjusted standard from the generally applicable landfill regulations continue to apply today. Since 1996, the Quarry has only accepted bottom ash for disposal, and until the MWGen Stations at Joliet were converted to natural gas in 2016, the Quarry has operated the same as it operated when the Board issued its AS 96-9 Final Order. Because neither the operations nor materials disposed have changed, there is no basis or need to modify the other provisions of AS 96-9.

In particular, in 1996, the Board found that it was impractical to require a system to drain and collect leachate required by 35 Ill. Adm. Code 814.302(b)(1) based upon the unique configuration of the Quarry. (Ex. 1, Order, p. 6).<sup>4</sup> The configuration of the Quarry is the same today. Water in the Quarry continues to flow through the gravity-flow drainage system, and the water ultimately is discharged pursuant to the Quarry's NPDES permit. (Ex. 2 at ¶4).

Similarly, unlike municipal solid waste landfills, in 1996 the Quarry accepted only bottom ash and slag from the Joliet electric generating Stations 9 and 29. The Board found that "given the absence of organic chemicals and consistency of constituents for almost 20 years" in the Quarry, the concerns underlying the monitoring requirements in the landfill regulations were not present, and an adjusted standard from 35 Ill. Adm. Code 811.319(a)(2)<sup>5</sup> and 811.319(a)(3)<sup>6</sup> was warranted. (Ex. 1, Order, at p. 9). The Board's conclusions equally apply today. From 1996 to the present, only bottom ash and slag were placed in the Quarry and the constituents in the ash remained the same. (Ex. 3 at ¶6). Since the gas conversion in 2016, only bottom ash from the cleanout associated with the conversion and the closure of residual ash ponds from Joliet 29 Station north of the river has been placed in the Quarry. Once the Joliet 29 ash ponds are empty, no additional ash or any waste material will be placed in the Quarry. (Ex. 3 at ¶7).

<sup>4</sup> The language in 35 Ill. Adm. Code 814.302(b)(1) has not changed since the original Petition for Adjusted Standard was filed in 1996.

<sup>5</sup> The language in 35 Ill. Adm. Code 811.319(a)(2) has not significantly changed since the original Petition for Adjusted Standard was filed in 1996, other than Section 811.319(a)(2)(ii), which was modified to include a minimum list of constituents for municipal solid waste landfills and a requirement that a facility that does not accept primarily municipal waste determine additional factors. As MWGen analyzes the groundwater samples for the constituents from coal ash, these modifications to Section 811.319 do not change the conclusion that the approved adjusted standard for groundwater monitoring continues to be applicable.

<sup>6</sup> The language in 35 Ill. Adm. Code 811.319(a)(3) has not significantly changed since the original Petition for Adjusted Standard was filed in 1996, other than Section 811.319(a)(3)(A), which was modified to include a list of organic chemicals. Because coal ash disposed in the Main Quarry does not contain organic chemicals, this modification to Section 811.319(a)(3)(A) does not change the conclusion that the approved adjusted standard for groundwater monitoring continues to be applicable.

In 1996, the Board also concluded that an alternative groundwater monitoring network was required because the groundwater flow regime at the Quarry was not the type considered by the Board when adopting 35 Ill. Adm. Code 811.318(b)(3).<sup>7</sup> The groundwater flow regime at the Quarry is unchanged.<sup>8</sup> (Ex. 2, ¶4). The natural groundwater flows from the south to the north and east to west and the groundwater elevation of the surrounding area is higher than the base of the Quarry. (Ex. 2, ¶5). Since 1996, MWGen has installed additional monitoring wells and conducted detailed groundwater monitoring that “establish a network of groundwater monitoring wells that protects the environment and which comprehensively and accurately depicts constituent migration at the Site.” (Ex. 1, Order, at p. 11, citing 1996 Petition, at p. 72 (attached as Exhibit 5)).<sup>9</sup> As a result, the current groundwater monitoring network is more expansive and comprehensive than that originally approved by the Board. (Ex. 2, ¶¶6-7).

The Board also granted an adjusted standard for 35 Ill. Adm. Code 811.320(c)<sup>10</sup> and granted a broader zone of attenuation as part of an agreement with the Illinois Environmental Protection Agency (“Illinois EPA”) to establish a groundwater management zone (“GMZ”). The GMZ was established as part of the remediation solution due to historic disposal of ash in the West Filled area at the Quarry. (Ex. 1, Order, p. 13). The Board concluded that an adjusted zone of attenuation was justified due to the chemistry of the Quarry, the local nature of the groundwater flow system, and because the future use of the groundwater will be controlled, preventing adverse

<sup>7</sup> The language in 35 Ill. Adm. Code 811.318(b)(3) has not changed since the original Petition for Adjusted Standard was filed in 1996.

<sup>8</sup> Today, due to the operations of the Vulcan Quarry, there is a southerly component in the groundwater flow. In response to the Vulcan Quarry operations, MWGen has installed a groundwater extraction system. The groundwater extraction system is unrelated to the Final Cover system that is the subject of this Petition. (Ex. 2, ¶6).

<sup>9</sup> In Illinois EPA’s Response to the 1996 Petition is attached for reference as Exhibit 6. Illinois EPA recommended that the requested adjusted standard be granted. (Ex. 6, p. 5).

<sup>10</sup> The language in 35 Ill. Adm. Code 811.320(c) has not changed since the original Petition for Adjusted Standard was filed in 1996.

environmental or health effects. (Ex. 1, Order, p. 14). The Board's conclusions continue to apply today. The groundwater monitoring and modeling at the Quarry show that the concentrations in the groundwater from the Main Quarry do not negatively affect Des Plaines River water quality. (Ex. 2, ¶8). Additionally, as in 1996, MWGen continues to control the future use of the groundwater, preventing adverse environmental or health effects. (Ex. 2, ¶10).

**B. The Final Cover Approved by AS 96-9 Can Be Improved Based on Current Technology.**

In 1996, the Board also granted an adjusted standard for the final cover of the Main Quarry. Because the water infiltration through percolation was relatively small compared to the groundwater infiltration into the waste area, the Board found there was no environmental benefit to installing a cover pursuant to Section 811.314. (Ex. 1, Order, p. 17). Additionally, because the conditions under which the Main Quarry would be closed were unknown in 1996 (*i.e.*, either closure below the water table or above the water table), the Board granted two alternative cover systems for the Main Quarry (Conditions 7(b) and 7(c)). (Ex. 1, Order, p. 17, 22-23). If the Main Quarry were to be closed above the water table (a/k/a "dry closure"), AS 96-9 provided that the cover would be a 2-foot layer of compacted soil having a hydraulic conductivity of  $1 \times 10^{-7}$  cm/sec., overlain by at least four inches of topsoil. (Ex. 1, Order, p. 23).

If MWGen pursues dry closure of the Main Quarry, MWGen prefers to use the ClosureTurf two-stage cover system because it is superior technology to what was available in 1996. (Ex. 2, ¶11). The ClosureTurf cover has a low permeability geomembrane layer that meets the requirements of the final cover requirements in 35 Ill. Adm. Code 811.314(b). (Ex. 2, ¶¶, 11, 13) Additionally, the ClosureTurf cover has a final protective layer that is different from, but meets or exceeds the performance of, the final protective cover provided for in 35 Ill. Adm. Code 811.314(c)



and allowed in the Adjusted Standard. (Ex. 2, ¶12) As described in detail below, the final protective layer is comprised of a synthetic turf layer with a 0.5-inch sand infill, which effectively prevents erosion and reduces the maintenance requirements that are associated with a vegetative layer. *See* Sec. (g) and (h), (Ex. 2, ¶12). Accordingly, MWGen requests that the Board revise Condition 7(c) to provide that MWGen may use the ClosureTurf two-stage cover system if it pursues dry closure.

**C. The Board has the Authority to Issue a New Adjusted Standard with Only One Condition Modification.**

The Board has previously issued a new adjusted standard to modify one specific part of the previously approved adjusted standard. In *In the Matter of: Petition of Metropolitan Water Reclamation District of Greater Chicago for an Adjusted Standard from 35 Ill. Adm. Code 811, 812 and 817 and Modification of AS 95-4*, the Metropolitan Water Reclamation District (“MWRD”) requested that the Board modify AS 95-4, which the Board had previously approved. (MWRD’s Petition For An Adjusted Standard, *In the Matter of: Petition of Metropolitan Water Reclamation District of Greater Chicago for an Adjusted Standard from 35 Ill. Adm. Code 811, 812 and 817 and Modification of AS 95-4*, AS 03-02, p. 1 (Feb. 11, 2003), attached as Exhibit 7, attachments excluded). In the first adjusted standard, AS 95-4, the Board granted MWRD’s petition to use MWRD dried sludge material at non-hazardous waste landfills in lieu of soil material for the top protective layer for final cover. (Ex. 7, p. 2). In MWRD’s request for modification, MWRD asked the Board to modify the temperature and detention time requirements for the processed sludge enumerated in Condition 3.a of its adjusted standard. (Ex. 7, p. 2, 13). In particular, MWRD requested the revision because the original adjusted standard, AS 95-4, did not consider the temperature fluctuations that occurred periodically during the processing of the sludge, and that were accepted by the U.S.EPA in the federal Sewer Sludge regulations. (Ex. 7, p.

7). In its petition for revision, MWRD referenced its prior petition, incorporated by reference the sections and information contained in the petition, and only addressed the specific issue it was requesting be modified. (Ex. 7, pp. 9-12).

The Board granted MWRD's request and issued a new adjusted standard in which the Board retained all but one of the existing adjusted standard conditions. As requested by the MWRD, the Board modified one condition to reflect the updated temperature and detention time requirements. *See Board Order, In the Matter of: Petition of Metropolitan Water Reclamation District of Greater Chicago for an Adjusted Standard from 35 Ill. Adm. Code 811, 812 and 817 and Modification of AS 95-4, AS 03-02, p. 7, 11-12 (July 24, 2003), attached as Exhibit 8.*<sup>11</sup> With the exception of the one modified condition, the new adjusted standard, AS 03-02, included all the other conditions as originally stated in the original adjusted standard. *Id.*

### **III. Analysis and Petition Content Requirements**

The Board requires that certain information be included in each petition for an adjusted standard. 35 Ill. Adm. Code §104.406. In this case, however, MWGen seeks only a revision to one part of a condition of its existing adjusted standard. The informational requirements for the previously approved conditions in the existing adjusted standard still apply as well as the basis for approving the adjusted standard. Accordingly, MWGen is addressing the informational requirements in 104.406 as they relate to its request to modify Condition 7(c) of AS 96-9.

- a) Standard from which Adjusted Standard is Sought. The rule-of-general applicability for which MWGen requests an adjusted standard is at 35 Ill. Adm. Code 811.314. MWGen requests that Condition 7(c) of its AS-96-9 be revised as described herein.

<sup>11</sup> MWRD noted, and the Board, agreed that the Board's rules do not provide a method for amending an adjusted standard. *Id.* at 7. Thus, the Board granted a new adjusted standard. *Id.*

- b) Whether the regulation was promulgated to implement ... RCRA.... The 811.314 regulation was promulgated to implement the State program concerning RCRA.
- c) Level of Justification as Specified by the Regulation. Section 811.314 does not include a specific justification for an adjusted standard.<sup>12</sup>
- d) Nature of Petitioner's Activity that is the Subject of the Proposed Adjusted Standard. The Main Quarry is approximately 43 acres in size and is located south of the Des Plaines River at the corner of Brandon Road and Patterson Road in unincorporated Will County, south of Joliet, Illinois. (Ex. 2, ¶15, Ex. 3, ¶3). MWGen has used the Main Quarry site for the disposal of CCR from the Joliet 9 and Joliet 29 Generating Stations. The two stations employ 47 people. (Ex. 3, ¶4). As described in the Board's 1996 Order, the Main Quarry has been used to receive bottom ash since about 1975. (Ex. 1, Order, p. 2). When the generating stations were fueled by coal, the Main Quarry operated as a landfill to manage the sluice water and CCR from the stations. (Ex. 1, Order, p. 2).

The currently applicable closure method at the Main Quarry is Condition 7 in the 1996 Adjusted Standard AS-96-9, which is adjusted from the generally applicable rule 35 Ill. Adm. Code 811.314. (Ex. 1, Order, Condition 7). The Adjusted Standard allows for either wet closure or dry closure. *Id.* If dry closure is selected, the Adjusted Standard requires a two-stage final cover system, consistent with 35 Ill. Adm. Code 811.314. *Id.* The Adjusted Standard requires a two-foot thick low permeability layer with a hydraulic conductivity of  $1 \times 10^{-7}$  cm/sec, and a final protective layer of 4-inches of topsoil. *Id.*

<sup>12</sup> Section 811.314(c) describes alternative requirements for an infiltration barrier for an owner of an municipal solid waste landfill ("MSWLF") that disposes of less than 20 tons of waste, which does not apply to the Quarry.

Since the Adjusted Standard was granted, new technology is available for a final cover system referred to as a “ClosureTurf” final cover system. ClosureTurf is a relatively new proprietary cover system (not available at the time of the initial Adjusted Standard), which consists of a geomembrane low permeability layer covered with synthetic turf and sand in place of a soil protective layer. (Ex. 2, ¶¶11-13). The ClosureTurf cover system will cover the Main Quarry area of approximately 43 acres and tie into the east slope of the West Fill Area, within the property limits of the Quarry, for a total final cover surface area of approximately 47 acres. (Ex. 2, ¶15). Upon installation, the design of the ClosureTurf system would allow stormwater to pass through the synthetic turf and sand infill, and onto the surface of the geomembrane. (Ex. 2, ¶14) Stormwater would then flow to the drainage system of the North Quarry, and ultimately discharged pursuant to the Quarry’s NPDES permit. *Id.*

Since the conversion of the Joliet Stations to natural gas in 2016, only groundwater flow has “discharged” into the Quarry. In 1996, the influx of groundwater into the Main Quarry was conservatively estimated at 664,400 gallons per day (“gpd”). (Ex. 5, pp. 30-31). Additionally, in 1996, approximately 76% of the conservatively estimated total groundwater flow (approximately 505,000 gpd) that entered the Main Quarry discharged through the gravity flow system into the North Main Quarry and reached the Des Plaines River through the North Main Quarry pumping system under NPDES Permit No. IL0002216. *Id.* The remaining 24% (approximately 159,400 gpd) of the groundwater discharged directly to the Des Plaines River. *Id.* The drainage, pumping and discharge system in the Main Quarry operates the same way today as it did in 1996, thus the estimated percentage of groundwater that drains into the North Quarry and Des Plaines River is unchanged. (Ex. 2, ¶9). In 2013, MWGen had groundwater modeling conducted as part of the revised Groundwater Impact Assessment submitted and

approved to the Illinois EPA. *Id.* The groundwater modeling estimated that the volume of groundwater that discharges into the Main Quarry had decreased to approximately 542,900 gpd. *Id.* Accordingly, of the groundwater that enters the Main Quarry, 412,600 gpd to 505,000 gpd (*i.e.*, 76% of the total volume) is discharged through the gravity flow system into the North Main Quarry, and the remaining groundwater flow, 130,300 gpd to 159,400 gpd, discharges to the Des Plaines River. *Id.*

The original 1996 petition contains a detailed description of the pollution control equipment currently used at the Quarry, and that will be in use upon closure. (Ex. 5). There is no pollution control equipment currently associated with the final cover of the Main Quarry because the Quarry is not yet closed.

- e) Efforts to Comply with Regulation. Closing the Main Quarry in accordance with section 811.314, requires a two-part final cover system consisting of a low permeability layer and a final protective layer. Compliance with the generally applicable regulation for the final cover system as opposed to the proposed ClosureTurf two-part system, entails significantly higher costs with no added environmental benefits. It would consist of a 3-foot thick low permeability soil layer and a 3 feet thick final protective layer of soil spread over 47 acres. 35 Ill. Adm. Code § 811.314(b)(3)(A). The two-part final cover would require 250,250 cubic yards (“CY”) of clay, and an additional 250,250 CY of soil for the final protective layer. (Ex. 2, ¶18). MWGen does not have an onsite borrow source, accordingly the soils for both layers would have to be purchased and brought on site from an offsite source. (Ex. 2, ¶19). Bringing a total quantity of 500,500 CY of soils to the site would require 33,367 trucks based on a 15 CY per truck capacity. (Ex. 2, ¶20). The total cost for purchase and transport of the soil quantities required for the soil layers would be approximately \$13,000,000. *Id.*

Under the generally applicable regulation, the other final cover design alternative is a geomembrane layer that meets or exceeds the performance capabilities of the soil low permeability layer which is covered by a vegetation-supporting three-foot thick soil protective layer. 35 Ill. Adm. Code 811.314(b)(3)(B). The total construction cost of a geomembrane low permeability layer and a three-foot soil protective layer (approx. 250,250 CY) is approximately \$10,300,000. (Ex. 2, ¶21).

The Adjusted Standard, AS 96-9, instead allows a 2-foot low permeability layer and a 4-inch protective layer, (Ex. 1, p. 23), which would require approximately 167,000 CY of clay, and an additional 28,000 CY of soil for the final protective layer. (Ex. 2, ¶22). The total approximate cost for the Adjusted Standard final cover would be approximately \$6,100,000. (Ex. 2, ¶23).

The Adjusted Standard post-closure requirements for the final cover are the same as for a generally applicable final cover. For all of the approved final covers, the post-closure requirements include mowing of the grass on the cover, annual inspections, and conducting any necessary repairs to the vegetative cover or the drainage channels. (Ex. 2, ¶24). The annual cost for post-closure care is approximately \$277,000. The total post-closure care cost for thirty years of post-closure activities is \$8,310,000. (Ex. 2, ¶25)

A fourth alternative is removing all CCR from the Main Quarry and disposing it in a licensed offsite landfill. Complete removal of all the CCR would require the removal and offsite disposal of an estimated 2,600,000 CY of ash material. (Ex. 2, ¶26). The cost for excavation of the CCR is estimated at \$38,400,000 based on the original 1994 cost updated to 2018 costs. (Ex. 2, ¶27). Disposal of all the CCR from the Main Quarry would cost in excess of \$230,000,000 based on updating the original 1994 cost to 2018 costs and would require

approximately 149,700 truckloads to remove it to an off-site landfill. (Ex. 2, ¶28). Accordingly, the total cost for removal and disposal of the CCR is \$268,400,000.

- f) Proposed Adjusted Standard. MWGen's requested revision changes the language in Condition 7(c) of AS96-9 to allow MWGen to use the improved final closure two-stage system, ClosureTurf, which uses a geomembrane as a low permeability layer and meets the specific requirements in 35 Ill. Adm. Code 811.314(b). The ClosureTurf system also uses a protective layer system that works as effectively as soil material to protect the geomembrane from freezing and UV exposure. This protective layer system also eliminates the risk of erosion caused by wind and stormwater.

MWGen proposes that Condition 7(c) be revised as follows:

Redlined Proposed Changes:

- 7) Final Cover.
- a) For purposes of b) and c) below, "maximum adjusted seasonal water table level" means the maximum predicted water table level in the vicinity of the Joliet/Lincoln Quarry Site, determined at the time of closure, plus sufficient elevation to ensure the integrity of a cap.
  - b) Closure Below Water Table.
    - i) If, at the time of closure, the level of settled ash in Lincoln Quarry is at or below the maximum adjusted seasonal water table level, no final cover is required for the Quarry and the Quarry shall be maintained as an impoundment.
    - ii) Water levels in the Quarry shall be maintained at or below a maximum elevation of 570 feet above sea level.
    - iii) A chain link fence no less than eight (8) feet in height, topped by a no less than three (3) strands of barbed wire, shall be installed around the Joliet/Lincoln Quarry Site to prevent access and shall be maintained in good condition at all times.
  - c) Closure Above Water Table.

- i) If, at the time of closure, the level of settled ash in Lincoln Quarry is above the maximum adjusted seasonal water table level, Edison MWGen shall install “ClosureTurf”, a two-stage cover system which shall consist of a geomembrane layer that has a hydraulic conductivity of at least  $1 \times 10^{-7}$  cm/sec, overlain with a cap of synthetic turf infilled with 0.5 inches of sand. ~~a two-stage cover system, which shall consist of a compacted clay layer that performs equivalently to a 2 foot layer of compacted soil having a hydraulic conductivity of  $1 \times 10^{-7}$  cm/sec, overlain by at least four inches of topsoil.~~ The cap shall be graded to maintain a positive grade from the perimeter of the Main Quarry walls to the discharge pipes, at no less than 2% grade and shall drain to a collection area located on the cap. Stormwater collecting on the cap shall gravity drain through the discharge pipes to the North Quarry for settling prior to discharge pursuant to the facility’s NPDES permit. ~~be pumped to the North Quarry for settling prior to discharge pursuant to the facility’s NPDES permit. The cap shall be seeded to prevent erosion.~~
  
- ii) Water levels in the Main Quarry shall be maintained through use of an underdrain collection system located below the geomembrane layer of the cover system located at the discharge pipes. Groundwater shall drain by gravity to the North Quarry for settling prior to discharge pursuant to the facility’s NPDES permit. ~~at no more than 570 feet above sea level through use of a gravel drainage blanket underlying the stormwater collection area. Water collecting in the drainage blanket shall drain by gravity to the North Quarry for settling prior to discharge pursuant to the facility’s NPDES permit.~~

Clean Final Proposed Changes:

- 7) Final Cover.
  - a) For purposes of b) and c) below, “maximum adjusted seasonal water table level” means the maximum predicted water table level in the vicinity of the Joliet/Lincoln Quarry Site, determined at the time of closure, plus sufficient elevation to ensure the integrity of a cap.
  - b) Closure Below Water Table.
    - i) If, at the time of closure, the level of settled ash in Lincoln Quarry is at or below the maximum adjusted seasonal water table level, no final cover is required for the Quarry and the Quarry shall be maintained as an impoundment.



- ii) Water levels in the Quarry shall be maintained at or below a maximum elevation of 570 feet above sea level.
  - iii) A chain link fence no less than eight (8) feet in height, topped by a no less than three (3) strands of barbed wire, shall be installed around the Joliet/Lincoln Quarry Site to prevent access and shall be maintained in good condition at all times.
- c) Closure above Water Table.
- i) If, at the time of closure, the level of settled ash in Lincoln Quarry is above the maximum adjusted seasonal water table level, MWGen shall install "ClosureTurf", a two-stage cover system which shall consist of a geomembrane layer that has a hydraulic conductivity of at least  $1 \times 10^{-7}$  cm/sec, overlain with a cap of synthetic turf infilled with 0.5 inches of sand. The cap shall be graded to maintain a positive grade from the perimeter of the Main Quarry walls to the discharge pipes. Stormwater collecting on the cap shall gravity drain through the discharge pipes to the North Quarry for settling prior to discharge pursuant to the facility's NPDES permit.
  - ii) Water levels in the Main Quarry shall be maintained through use of an underdrain collection system located below the geomembrane layer of the cover system located at the discharge pipes. Groundwater shall drain by gravity to the North Quarry for settling prior to discharge pursuant to the facility's NPDES permit.

The remaining Conditions to AS-96-9 are unchanged. This revision will allow MWGen to install a final cover more effective than the cover approved in Condition 7(c) in AS 96-9.

g) Description of Impact on the Environment of Complying with the Regulation vs. Complying with the Adjusted Standard.

Neither the generally applicable nor the existing Adjusted Standard cover systems requirements have a more favorable environmental impact compared to the ClosureTurf cover system proposed here.<sup>13</sup> Rather, the ClosureTurf two-stage cover system is better technology because it includes a low permeability geomembrane layer with a permeability of  $1 \times 10^{-13}$  cm/sec, which provides a higher degree of protection against seepage through the final cover

<sup>13</sup> In its decision on the original adjusted standard petition, the Board found that the generally applicable cover system had little or no favorable environmental impact when compared to the adjusted standard's two-foot thick compacted clay layer and four-inch protective layer for dry closure. (Ex. 1, Order, p. 17, Ex. 5, pp. 97-98)

than the permeability standard contained in 35 Ill. Adm. Code 811.314(b). (Ex. 2, ¶13; Ex. 4, Technical Memorandum, *See also* Sec. (h)). Additionally, the protective cover layer of the ClosureTurf system of turf and sand infill installed to protect the geomembrane layer is expected to provide better protection against erosion from stormwater runoff, wind speeds, and even vehicle traffic. (Ex. 2, ¶11-12, Ex. 4, *See also* Sec. (h)). Hence, there should be a lower potential for, and frequency of, needed maintenance or repairs to the final cover system.

Not only is the ClosureTurf system environmentally more beneficial than the generally applicable final cover, the installation process for the ClosureTurf will have less of an environmental impact. The environmental impacts of the generally applicable final cover installation include increased fugitive particulate emissions during soil delivery and the placement and grading of the soil layer. Delivery and installation of the ClosureTurf system, compared to the generally applicable regulation, is estimated to decrease total construction related carbon emissions and PM<sub>2.5</sub> emissions by 65%. (Ex. 2, ¶29).

- h) Justification of Proposed Adjusted Standard. As described in detail by the Board in its Opinion and Order AS 96-9, the justification for the alternative cover is not necessarily affected by this request to revise a condition. (Ex. 1, Order, pp. 16-17). Instead, revision of Condition 7(c) will allow MWGen to use the ClosureTurf two-part cover system that is at least equivalent and in some ways superior to the Illinois landfill regulations, and more effective than the system approved in AS 96-9. Overall, the benefits of ClosureTurf include a reduction of installation and maintenance time, long-term maintenance efforts and costs, and environmental impacts associated with construction. (Ex. 2, ¶¶11-14). ClosureTurf was approved for use as final cover in 2017 for a CCR impoundment in Meredosia, IL closed by Ameren Energy and has also been

used in approximately 17 other states. (Ex. 4, p. 1). The total estimated cost for installation of the ClosureTurf is approximately \$8,900,000 (Ex. 2, ¶16).

Low Permeability Layer: The geomembrane used in the ClosureTurf cover system will achieve a permeability of  $1 \times 10^{-13}$  cm/s, which is less than the  $1 \times 10^{-7}$  cm/s required under 35 Ill. Adm. Code 811.314(b)(3). The permeability of the geomembrane was determined from research conducted by CTT Group. (Ex. 2, ¶13, Ex. 10). The geomembrane that will be used in the ClosureTurf system is substantially lower in permeability than the standard  $1 \times 10^{-7}$  cm/s design requirement, and will result in less potential precipitation infiltrations thereby exceeding design requirements. (Ex. 2, ¶13, Ex. 4). Accordingly, the geomembrane in the ClosureTurf system is in accordance with the requirements of 35 Ill. Adm. Code 811.314(b)(3).

Final Protective Layer: The ClosureTurf final protective layer consists of synthetic turf with sand infill that completely covers the geomembrane and prevents it from being exposed and degraded by UV radiation. (Ex. 2, ¶¶11-12). The synthetic turf and sand infill are specifically designed to stay in place during rain events and do not require vegetation to hold it in place. *Id.* Additionally, the synthetic turf and sand infill allow stormwater to pass through them onto the surface of the geomembrane, which is designed to transport stormwater to the drainage system to the North Quarry. (Ex. 2, ¶14). Because the purpose of the protective layer is to prevent the degradation of the low permeability layer to ensure its performance against infiltration into the waste being covered, the ClosureTurf protective layer will protect the geomembrane from desiccation, root penetration, and erosion. (Ex. 2, ¶12). The Geosynthetic Institute (“GSI”) published White Paper #28 (attached as Exhibit 9) reported that the tensile tests on the geomembrane “showed no change in the peak strength or peak elongation of any of the tested materials”, the shear tests on the geomembrane seams “showed no change in shear

strength of any of the tested seam materials”; and the peel tests on the geomembrane seams “showed no change in peel strength of any of the tested seam materials” when exposed to freeze-thaw cycle. *Id.* at p. 7-8. The GSI White Paper further states there is simply ‘no change’ in tensile behavior of geomembrane sheets or their seams after freeze-thaw cycling. *Id.* The authors answer the question of whether freeze-thaw cycling will affect geomembranes and their seams with “a resounding NO.” *Id.* at p. 10. In short, the freeze-thaw cycle the ClosureTurf system will experience in Joliet, Illinois will not negatively impact its performance.

Additionally, ClosureTurf eliminates the need for vegetation by using synthetic turf and sand infill to cover the geomembrane. The synthetic turf looks similar to natural grass and is available in green, tan, or a green/tan combination of colors to blend with the surrounding environment and create the appearance of grass. (Ex. 2, ¶11). The synthetic turf is specifically designed to grab and hold the sand infill to prevent its migration during rain and wind events. *Id.* Third party testing has shown that the design of the synthetic turf is able to resist uplift pressure from winds as high as 120 miles per hour (mph). (Ex. 4, p. 2). This testing also showed that the sand infill did not migrate during the high wind speeds, but acted as a ballast for the synthetic turf during the high wind speeds. (Ex. 4, p. 5). The synthetic turf used in ClosureTurf is designed to prevent the migration of the sand infill and the sand infill particle size is chosen to work in concert with the synthetic turf design. (Ex. 4, p. 11-12). ClosureTurf was tested by a third party in accordance with ASTM 6459 using rainfall intensities correspond to about a 2-year, 24-hour storm; about a 25-year, 24-hour storm; and about a 100-year, 24-hour storm; respectively, based on the runoff conditions at LSQ. (Ex. 4, p. 12). Sand infill was not identified in the 2-year or 25-year storm runoff and only 0.41 lbs. of sand infill was identified in the 100-

year storm runoff. (Ex. 4, p. 12). ClosureTurf will adequately minimize the transport of any sand infill into the receiving water body, and minimize any erosion from the final protective layer.

The absence of a vegetative cover is a significant advantage of the ClosureTurf system. Post-closure care for ClosureTurf for the 30- year post-closure period is estimated to be approximately \$5.1 million, which is significantly less than the cost of the estimated post-closure care for a generally applicable final cover. (Ex. 2, ¶17, 24).

Supplemental information regarding the effectiveness of the ClosureTurf, including its durability, longevity, accessibility, and other considerations are described in the Memorandum attached as Exhibit 4.

- i) Reasons the Board may Grant the Proposed Adjusted Standard. The reasons for granting the adjusted standard are detailed in the Board's Opinion and Order at Att. A. (Ex. 1, Order). Amending Condition 7(c) of the Board's Order will not change the Board's findings or analysis, only adjust the type of two-state cover system that will be used. The Board may also grant this revision of Condition 7(c) of AS 96-9 because it is consistent with federal law, and there are no procedural requirements applicable to the Board's decision on the petition that are imposed by federal law and not required by the Board regulations. As described in Section II.C. above, the Board has previously issued a new Adjusted Standard in which it modified only one Condition based upon new information from a Petitioner. *In the Matter of: Petition of Metropolitan Water Reclamation District of Greater Chicago for an Adjusted Standard from 35 Ill. Adm. Code 811, 812 and 817 and Modification of AS 95-4, AS 03-02, p. 1* (Feb. 11, 2003). (Ex. 8). For similar reasons that the Board granted the Metropolitan Water Reclamation District's petition, the Board may grant MWGen's petition here.

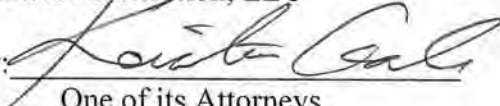
- j) Hearing on the Petition. MWGen waives a hearing on the petition. MWGen's Petition is limited to a single condition change regarding the type of final cover and does not require re-visiting the Board's prior findings and decision to issue the adjusted standard.
- k) As required by 35 Ill. Adm. Code 104.406(k) and (l), MWGen has provided the citations to relevant supporting documents and legal authorities and has provided required information as applicable to its request for revising Condition 7(c) of the existing adjusted standard.

#### **IV. Conclusion**

For the reasons stated, MWGen requests the Board enter an Order that maintains the existing adjusted standard but revises Condition 7(c) to allow for the ClosureTurf final cover system as described in this Petition.

WHEREFORE, Midwest Generation LLC requests that the Board grant this revision to Condition 7(c) of its adjusted standard AS-96-9.

Respectfully submitted,  
Midwest Generation, LLC

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