BEFORE THE ILLINOIS POLLUTION CONTROL BOARD

IN THE MATTER OF:	)	
	)	R 2020-019
STANDARDS FOR THE DISPOSAL	)	
OF COAL COMBUSTION RESIDUALS	)	(Rulemaking - Water)
IN SURFACE IMPOUNDMENTS:	)	
PROPOSED NEW 35 ILL. ADM.	)	
CODE 845	)	

NOTICE OF FILING

PLEASE TAKE NOTICE that I have today filed with the Office of the Clerk of the Illinois Pollution Control Board a **NOTICE OF FILING** and **PRE-FILED TESTIMONY** on behalf of the Illinois Environmental Protection Agency, a copy of which is herewith served upon you.

Respectfully submitted,

Dated: June 2, 2020

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY,

Stefanie N. Diers
Division of Legal Counsel
Illinois Environmental Protection Agency
1021 North Grand Avenue East
P.O. Box 19276
Springfield, IL 62794-9276
(217) 782-5544

Petitioner,

BY: /s/ Stefanie N. Diers
Stefanie N. Diers

THIS FILING IS SUBMITTED ELECTRONICALLY

SERVICE LIST

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PRE-FILED TESTIMONY

The following pre-filed testimony is being submitted on behalf of the Agency: William Buscher, Lynn Dunaway, Amy Zimmer, Lauren Martin, Chris Pressnall, Robert Mathis, Darin LeCrone and Melinda Shaw.

Respectfully submitted,

Dated: June 2, 2020

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY,

Stefanie N. Diers
Division of Legal Counsel
Illinois Environmental Protection Agency
1021 North Grand Avenue East
P.O. Box 19276
Springfield, IL 62794-9276
(217) 782-5544

Petitioner,

BY: /s/ Stefanie N. Diers
Stefanie N. Diers

THIS FILING IS SUBMITTED ELECTRONICALLY

CERTIFICATE OF SERVICE

I, the undersigned, on affirmation state the following:

That I have served the attached **NOTICE OF FILING** and **PRE-FILED TESTIMONY** by e-mail upon Don Brown at the e-mail address of don.brown@illinois.gov, upon Renee Snow at the e-mail address of Renee.Snow@Illinois.Gov, upon Matt Dunn at the e-mail address of mdunn@atg.state.il.us, upon Stephen Sylvester at the e-mail address of ssylvester@atg.state.il.us, upon Andrew Armstrong at the e-mail address of aarmstrong@atg.state.il.us, upon Kathryn A. Pamenter at the e-mail address of KPamenter@atg.state.il.us, upon Virginia I. Yang at the e-mail address of virginia.yang@illinois.gov, upon Nick San Diego at the e-mail address of nick.sandiego@illinois.gov, upon Robert G. Mool at the e-mail address of bob.mool@illinois.gov, upon Vanessa Horton at the e-mail address of Vanessa.Horton@Illinois.gov, upon Paul Mauer at the e-mail address of Paul.Mauer@illinois.gov, upon Deborah Williams at the e-mail address of Deborah.Williams@cwlp.com, upon Kim Knowles at the e-mail address of Kknowles@prairierivers.org, upon Andrew Rehn at the e-mail address of Arehn@prairierivers.org, upon Faith Bugel at the e-mail address of fbugel@gmail.com, upon Jeffrey Hammons at the e-mail address of Jhammons@elpc.org, upon Keith Harley at the e-mail address of kharley@kentlaw.edu, upon Daryl Grable at the e-mail address of dgrable@clclaw.org, upon Michael Smallwood at the e-mail address of Msmallwood@ameren.com, upon Mark A. Bilut at the e-mail address of Mbilut@mwe.com, upon Abel Russ at the e-mail address of aruss@environmentalintegrity.org, upon Susan M. Franzetti at the e-mail address of Sf@nijmanfranzetti.com, upon Kristen Laughridge Gale at the e-mail address of kg@nijmanfranzetti.com, upon Vincent R. Angermeier at the e-mail address of va@nijmanfranzetti.com, upon Alec M. Davis at the e-mail address of adavis@ierg.org, upon Jennifer M. Martin at the e-mail address of Jmartin@heplerbroom.com, upon Kelly Thompson at the e-mail address of kthompson@ierg.org, upon Walter Stone at the e-mail address of Water.stone@nrgenergy.com, upon Cynthia Skrukrud at the e-mail address of Cynthia.Skrukrud@sierraclub.org, upon Jack Darin at the e-mail address of Jack.Darin@sierraclub.org, upon Christine Nannicelli at the e-mail address of christine.nannicelli@sierraclub.org, upon Stephen J. Bonebrake at the e-mail address of bonebrake@schiffhardin.com, upon Joshua R. More at the e-mail address of jmore@schiffhardin.com, upon Ryan C. Granholm at the e-mail address of rgranholm@schiffhardin.com, upon N. LaDonna Driver at the e-mail address of LaDonna.Driver@heplerbroom.com, upon Alisha Anker at the e-mail address of aanker@ppi.coop, upon Chris Newman at the e-mail address of newman.christopherm@epa.gov, upon Claire A. Manning at the e-mail address of cmanning@bhslaw.com, upon Anthony D. Schuering at the e-mail address of aschuering@bhslaw.com, upon Jennifer Cassel at the e-mail address of jcassel@earthjustice.org, upon Melissa Brown at the e-mail address of Melissa.Brown@heplerbroom.com, upon Thomas Cmar at the e-mail address of tcmar@earthjustice.org, upon Stefanie Diers at the e-mail address of

Stefanie.Diers@Illinois.gov, and upon Christine Zeivel and the e-mail address of Christine.Zeivel@illinois.gov.
That my e-mail address is Stefanie.diers@illinois.gov

That the e-mail transmission took place before 4:30 p.m. on the date of June 2, 2020.

/s/ Stefanie N. Diers
June 2, 2020

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PRE-FILED TESTIMONY OF WILLIAM E. BUSCHER

My name is William E. Buscher. I am a licensed professional geologist and the Manager of the Hydrogeology and Compliance Unit (HCU), Groundwater Section, Division of Public Water Supplies (Bureau of Water ("BOW"), at the Illinois Environmental Protection Agency. ("Illinois EPA" or "Agency"). I began working at the Agency in 1988 and have worked on the development and implementation of rules and regulations related to protecting, assessing, and restoring groundwater. The HCU provides technical expertise to the BOW Permit Section on groundwater issues. I have enclosed a copy of my Curriculum Vitae as Attachment I. Beginning in 1991, when the Groundwater Quality Standards were adopted, the HCU has worked closely with the BOW Permit Section on groundwater issues related to the handling of ash at coal fired electrical generation stations. Since the early 1990s, new ash impoundments have been built with low permeability liners to minimize impacts to groundwater resources and to install groundwater monitoring systems. Generally, ash impoundments constructed prior to this time did not have low permeability liners and groundwater monitoring systems. Beginning in the spring of 2019 when Senate Bill 9 was passed the Bureau of Water began drafting Part 845. Part 845 is generally based on the USEPA Part 257 regulations. My pre-filed testimony focuses on Subpart D: Design Criteria and portions of Subpart E: Operating Criteria. I can provide further explanation of my pre-filed testimony and answer additional questions as needed.

SUBPART D: DESIGN CRITERIA

Section 845.400: Liner Design Criteria for Existing Surface Impoundments

Proposed 845.400, details the specifications and requirements for a composite liner system and an alternative composite liner system. A composite liner utilizes an upper component of at a minimum, a 30-mil geomembrane liner and a lower component of at least two feet of properly compacted soil material. The criteria in this section must be evaluated to determine if an existing CCR surface impoundment meets these requirements. CCR surface impoundments, that have not completed an Illinois EPA-approved closure prior to July 30, 2021 and have been constructed in compliance with 845.400 must be identified. All CCR surface impoundments not compliant with 845.400 are subject to the closure or retrofit provisions of Section 845.700.

Section 845.410: Liner Design Criteria for New CCR Surface Impoundments and Any Lateral Expansion of a CCR Surface Impoundment

Proposed 845.410 contains the same liner design criteria found in Section 845.400. Upon completion of construction, a qualified professional engineer must certify that the composite liner or if applicable, the alternative composite liner has been constructed in accordance with this section.

Section 845.420: Leachate Collection and Removal System

Proposed 845.420 requires impoundments to be built with a leachate collection and removal system. The system will reduce the head (depth of water) on the CCR liner system. This reduction decreases the potential for seepage through the liner system. Upon completion of construction, a qualified professional engineer must certify that the leachate collection and removal system has been constructed in accordance with this Section. The combination of the Part 845.410

liner system, the leachate collection and removal system and the Part Section 845.410 final cover system will effectively minimize impacts to groundwater resources.

Section 845.430: Slope Maintenance

Proposed 845.430 generally requires the cover system to be properly maintained to protect it from erosion, be mowed on a regular basis, and kept free of woody vegetation.

Section 845.440: Hazard Potential Classification Assessment

Proposed 845.440 requires the completion and documentation of a hazard potential classification assessment for each CCR surface impoundment. The hazard potential classification and the basis of each hazard potential classification for each CCR surface impoundment as either a Class 1 or Class 2 CCR surface impoundment must be documented.

Section 845.450: Structural Stability Assessment

Proposed 845.450 requires the owner or operator to conduct an initial and annual structural stability assessment and document whether the design, construction, operation, and maintenance of the CCR surface impoundment is consistent with recognized and generally accepted engineering practices for the maximum volume of CCR and CCR wastewater which can be impounded. In the event that a deficiency or a release is identified during an assessment a construction permit application must be submitted to the Agency including documentation detailing proposed corrective measures. Necessary permits must be obtained from the Agency as soon as feasible.

Section 845.460: Safety Factor Assessment

Proposed 845.460 requires an initial and annual safety factor assessment for each CCR surface impoundment and documentation of whether the calculated factors of safety for each CCR surface impoundment achieve the minimum safety factors specified for the critical cross section of the

embankment. Failure to complete a timely safety factor assessment or failure to demonstrate minimum safety factors as required by this Section subjects the CCR surface impoundment to the closure requirements of Section 845.700.

SUBPART E: OPERATING CRITERIA

845.510 Hydrologic and Hydraulic Capacity Requirements for CCR Surface Impoundments

Proposed 845.510 specifies the requirements for an inflow flood control system for CCR surface impoundments. The requirements for the inflow flood control system include design, construction, operation, maintenance and submission of system plans and plan amendments to Illinois EPA.

845.540 Inspection Requirements for CCR Surface Impoundments

This Section specifies the minimum requirements for inspections conducted by a qualified person and the annual inspections by a qualified professional engineer. Documented inspections are required of CCR surface impoundments after storms for deterioration of the CCR surface impoundment structure. Additionally, weekly inspections of discharge flow mechanisms within and around the CCR surface impoundment are required. Finally, a qualified professional engineer will perform a detailed annual inspection of the CCR surface impoundment to document the integrity of the structure and supporting structures. Annual inspection reports and proposed corrective actions will be provided to the Illinois EPA. In the event that a deficiency or release is identified during an inspection, the owner or operator must submit to the Agency documentation detailing the proposed corrective measures and obtain the necessary permits from the Agency.

845.550 Annual Consolidated Report

This Section specifies the requirements of an Annual Consolidated Report which includes the Annual CCR Fugitive Dust Control Report, Annual Inspection Report, and Annual Groundwater Monitoring and Correction Action Report. The Annual Consolidated Report for the previous year must be prepared by January 31st of each year.

Conclusion

This concludes my pre-filed testimony. I will supplement the testimony as needed during the hearing and am happy to address any questions.

ATTACHMENT I

CURRICULUM VITA

WILLIAM E. BUSCHER P.G.
853 South MacArthur Blvd.
Springfield, Illinois 62704

Professional Experience

Illinois Environmental Protection Agency **April 1988 to Present**
Bureau of Water
Division of Public Water Supplies
Groundwater Section
Springfield, Illinois

Public Service Administrator **September 1994 to Present**

Duties Performed: Hydrogeology and Compliance Unit Manager generally responsible for the direct supervision of technical & professional staff implementing groundwater protection, assessment and remediation programs. Functions include construction & review of analytical and numerical groundwater flow models, evaluation of the hydrogeologic aspects of groundwater protection & remediation programs.

Environmental Protection Specialist IV **April 1993 to August 1994**

Duties Performed: Hydrogeology and Compliance Unit Manager generally responsible for the direct supervision of technical & professional staff implementing groundwater protection, assessment and remediation programs. Functions include construction & review of analytical and numerical groundwater flow models, evaluation of the hydrogeologic aspects of groundwater protection & remediation programs.

Environmental Protection Engineer III **March 1991 to April 1993**

Duties Performed: Reviewing hydrogeologic aspects of implementing Illinois' groundwater protection program. Including construction and reviewing analytical and numeric groundwater flow models, completing groundwater protection needs assessments, and reviewing groundwater remediation corrective action plans. Providing technical assistance to community water supplies interested in implementing well recharge area protection program.

Environmental Protection Engineer II **June 1990 to April 1991**

Duties Performed: Reviewing hydrogeologic aspects of implementing Illinois' groundwater protection program. Including construction and reviewing analytical and numeric groundwater flow models, completing groundwater protection needs assessments, and reviewing groundwater remediation corrective action plans. Providing technical assistance to community water supplies interested in implementing well recharge area protection programs.

Environmental Protection Engineer I **April 1988 to May 1989**

Duties Performed: Review hydrogeologic aspects of implementing Illinois' groundwater protection program. Including reviewing the lateral area of influence determinations for pumping wells, and groundwater remediation corrective action plans. Provided technical assistance to community water supplies interested in implementing well recharge area protection programs.

Metropolitan St. Louis Sewer District
2000 Hampton Avenue
St. Louis, Mo 63139-2979

Construction Inspector **July 1987 to November 1987**

Duties Performed: Inspected sewer line installation, logged soil and rock test borings and completed seismic studies for proposed sewer lines.

Lincoln Devore Inc. Geotechnical Consultants
1000 West Fillmore St.
Colorado Springs Co. 80907

Engineering Geologist **July 1984 to November 1986**

Duties Performed: Geotechnical report writing, soil and rock boring logging, monitor well installation, percolation tests, geological mapping aerial photo interpretation, seismic and resistivity studies, excavation observations and drilled pier observations.

Education

Bachelor of Science Geological Engineering **May 1984**
University of Missouri-Rolla
Rolla, Missouri

Licenses

Illinois Licensed Professional Geologist **September 1998**

License Number 196.000656
Expiration Date March 31, 2021

Additional Training

United States Geological Survey (MODFLOW and MODPATH groundwater modeling) **1992**
Geology 435 - Computer Modeling of Groundwater Systems **1995**

Publications

Buscher, W.E., and Cobb, R.P., 1990. Maximum Setback Zone Workbook. Illinois Environmental Protection Agency. 62 pp.

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PRE-FILED TESTIMONY OF LYNN E. DUNAWAY,

My name is Lynn E. Dunaway. I have a Bachelor of Science degree in Geology and am an Illinois Licensed Professional Geologist. My title is Environmental Protection Specialist IV, and I work in the Hydrogeology and Compliance Unit ("HCU"), Groundwater Section, Division of Public Water Supplies, Bureau of Water ("BOW"), at the Illinois Environmental Protection Agency ("Illinois EPA" or "Agency"). I began working at the Agency in February of 1988. I have worked on the development and implementation of rules and regulations related to protecting, monitoring and assessing, and restoring groundwater. The HCU provides technical expertise to the BOW Permit Section on groundwater issues. I have attached a copy of my Curriculum Vitae as Attachment 1. My pre-filed testimony focuses on Subpart A: Section 845.179 Inactive Closed CCR Surface Impoundments and Subpart F: Groundwater Monitoring and Corrective Action of the Part 845 proposal. I can give further explanation of my pre-filed testimony and answer additional questions as needed.

Subpart A: Section 845.170 Inactive Closed CCR Surface Impoundments

Proposed 845.170 provides a comprehensive list of the Sections of Part 845 that are applicable to inactive closed CCR surface impoundments, and that Sections cross referenced within applicable Sections are not also applicable. This proposed section also establishes the requirement for inactive closed CCR surface impoundments to initiate or continue corrective actions for releases that occurred prior to closure, and a process which must be followed for any

new releases which may occur during the post-closure care period of that CCR surface impoundment, including applicable assessments and permitting requirements.

Subpart F: Section 845.600 Groundwater Protection Standards

Since the adoption of 35 Ill. Adm. Code Part 620 in 1991, Illinois has had comprehensive groundwater quality standards ("GWQS") that by Illinois statute must recognize the unique aspects of groundwater including: water quality, rate and direction of flow, accessibility, susceptibility to contamination and use. Further, the statute requires a groundwater classification system that recognizes groundwater's utility as a resource and protects future use, with a preference for numerical standards where possible. All groundwater in Illinois is classified based on site-specific characteristics. With the adoption of USEPA's self-implementing rule, 40 CFR Part 257, in October 2015, USEPA established what are, in essence, federal groundwater quality standards (i.e. Groundwater Protection Standards or "GWPS"). However, in contrast to Illinois' GWQS, the federal GWPS apply only to CCR surface impoundments and landfills at utilities and independent power producers and any groundwater impacted by CCR surface impoundments. Not surprisingly, since they must apply nationwide, the federal GWPS do not take into consideration Illinois' groundwater classification scheme, nor do the federal GWPS have numerical values for all of the parameters commonly associated with CCR and for which monitoring is required. Significantly, the federal GWPS have a point of compliance for CCR surface impoundments and landfills at the waste boundary. To avoid the conflicts between Part 620 and Part 257, and complex modifications to Part 620, the Agency has proposed a set of GWPS in Part 845.600 that are applicable only to CCR surface impoundments at utilities and independent power producers, which are the subject of this proposed rule.

Part 257 divides the GWPS between two appendices, referred to as Appendix III and Appendix IV. With the exception of fluoride, which is in both Appendix III and Appendix IV, the parameters in Appendix III don't have MCLs. Most of the parameters in Appendix IV have MCLs. The existence of an MCL is significant because Part 257 uses the value of the MCL, when available, as a GWPS. For the Appendix IV parameters that don't have an MCL (i.e. Cobalt, Lithium, Molybdenum and Lead), USEPA adopted health-based values, and in the instance of Lead used the drinking water action level as the GWPS. Under Part 257, Appendix III parameters are used for detection monitoring, to determine if a release from a surface impoundment is likely to have occurred. Since the Appendix III parameters have no numerical GWPS (with the exception of fluoride which appears in both Appendix III and Appendix IV) in Part 257, a statistically derived background concentration is used to determine if a statistically significant increase (SSI) over background has occurred. If an SSI occurs, then assessment monitoring of the Appendix IV parameters is required. Under Part 257, only if there is a SSI of an Appendix IV parameter is corrective action required. However, Part 257 does not allow the end of post-closure care until the GWPS of both Appendix III and Appendix IV have been met, even though no corrective action is required for the exceedence of an Appendix III constituent. Prior to USEPA's adoption of numerical values for Cobalt, Lithium, Molybdenum and Lead in July, 2018, a statistically derived background was the only GWPS available for these parameters also. Additionally, Part 257 sets the GWPS at the background concentration when any Appendix IV parameter exceeds its numerical GWPS in the up gradient monitoring wells. Because many of the actions required by Part 257 rely on statistically derived values from groundwater monitoring data, and because Part 257 has and continues to change, the term SSI is applied in several different contexts.

Public Act 101-171 requires that the Agency propose, and the Board adopt rules under that amendatory Act, which are at least as protective and comprehensive as Part 257 and any amendments thereto. Though much of proposed Part 845 directly incorporates the language used in Part 257, proposed Subpart F incorporates several deviations from the Part 257 approach to groundwater monitoring and compliance with the GWPS. One such deviation is the elimination of the two-tiered (detection and assessment monitoring) groundwater monitoring approach, which is used in Part 257. The Agency is proposing simply a groundwater monitoring program. In part, this approach is proposed because the majority of CCR surface impoundments have installed a monitoring system which has been certified to be compliant with Part 257 and have completed the required background monitoring. The groundwater monitoring which has been completed demonstrates that exceedences of GWPS at old, unlined CCR surface impoundments are common. When exceedences are common, the tiered monitoring approach is unnecessary since there is a high degree of likelihood that groundwater monitoring will show exceedences of multiple parameters. However, the primary reason the Agency has proposed a single groundwater monitoring program is because all of the Part 257 Appendix III parameters (with the exception of Calcium) have numerical GWQS. Therefore, the Agency believes it is reasonable to have numerical values for the parameters included in Part 257 Appendix III and Appendix IV. Accordingly, the Agency has proposed a set of Part 845 GWPS applicable at existing CCR surface impoundments. The numerical values are listed in proposed Part 845.600(a), plus Calcium monitoring. The parameter concentrations proposed in Part 845.600(a) are the lower of the numerical concentrations adopted in Part 257 or the existing Class I GWQS for that parameter. The numerical concentration of a constituent is more protective than a background concentration in proposed Part 845.

The Part 257 GWPS for total dissolved solids (TDS) is the statistically derived background groundwater quality concentration, which may be significantly lower than the proposed 1,200 mg/l Part 845 GWPS (derived from the Class I GWQS). However, under Part 257, a SSI over background merely triggers assessment monitoring. As proposed in Part 845, an exceedence of the numerical GWPS of 1,200 mg/l triggers corrective action, just as it would in Class I groundwater. Further the point of compliance for the GWPS in Part 845 is at the waste boundary. Therefore, the application of numerical concentrations at the waste boundary, which trigger corrective action are more protective than background concentrations that trigger only monitoring of additional parameters. The exception with regard to the numerical GWPS, as proposed in Part 845.600(b) is when the up gradient background concentration of any constituent exceeds the numerical GWPS. In such an instance, an SSI over background is the only reasonable approach for compliance determinations.

The Agency also notes that Part 257 required the collection of "background" groundwater quality samples from down gradient monitoring wells. Many of the surface impoundments in Illinois have been operating for decades. Therefore, unless an up gradient background concentration exceeds the numerical GWPS, using an absolute numerical concentration as the metric by which corrective action is either initiated or terminated is a simple comparison. This approach makes it clear that concentrations in excess of the GWPS, in down gradient wells, do not need to have further increases in their current concentration, to initiate corrective action. An absolute numerical concentration also forestalls the application of different statistical methods which may result in a change to the trigger levels for either the initiation of or termination of corrective action. Such a change in statistical methods is quite possible due to the long

monitoring history during post-closure care, which could change the statistical character of the groundwater monitoring data, necessitating the use of a different statistical method.

Proposed Part 845.600(b) requires new CCR surface impoundments to use background as the GWPS for all of the constituents. Since Part 845 as proposed requires new CCR surface impoundments to be constructed with a composite liner and leachate collection, it follows that the GWPS for such a CCR surface impoundment should be background, to prevent groundwater degradation. Municipal solid waste landfills also use background as their GWPS.

For CCR surface impoundments that close with a final cover system, the requirements of proposed Part 845 end when post closure care has been completed. For CCR surface impoundments that close by removal, the requirements of proposed Part 845 end when groundwater monitoring demonstrates compliance with the GWPS has been achieved for three consecutive years after the physical removal of CCR is complete. However, during those time frames, any constituent with a Part 620 GWQS that is not subject to proposed Part 845, Subpart F still applies at CCR surface impoundments. For example: If during closure, a large fuel spill occurred within the CCR surface impoundment, 35 Ill. Adm. Code 620 and the standards related to fuel constituents would be applicable. Also, after the end of post-closure care pursuant to proposed Part 845, Part 620 still applies as it does throughout the rest of the State.

The GWPS in proposed Part 845 are intended to be stand-alone standards, unrelated to Part 620. Therefore, if the GWQS of Part 620 change during the period of applicability for proposed Part 845, the GWPS of proposed Part 845 remain the same, unless a revision to Part 845 is proposed to, and adopted by the Board. To that end, proposed Part 845.600(c) is intended to clarify that the alternative standard pursuant to Part 620.450(a)(4), which is available for any constituent with a GWQS, is not available for any constituents with GWPS subject to proposed

Part 845. Once the applicability of proposed Part 845 ends (at the end of post-closure care), the alternative standard pursuant to Part 620.450(a)(4), is once again available for any constituent with a GWQS. This concept is important because post-closure care for CCR surface impoundments closing by removal may cease being subject to proposed Part 845 in a relatively short time frame, while the completion of post-closure care for CCR surface impoundments closing with a final cover is many years in the future. In either situation, Part 620 once again becomes applicable, after the requirements of proposed Part 845 have been met.

Section 845.610 General Requirements

Proposed 845.610 lays out the requirements that all CCR surface impoundments subject to Subpart F must meet. This proposed Section requires that all groundwater monitoring will be subject to an operating permit for the entire active life of the CCR surface impoundment. The Section further describes the documents that must be submitted including a hydrogeologic site characterization, the design and construction details of the monitoring system and the groundwater sampling and analysis program including the establishment of background. This proposed Section does not preclude the use of existing information. In addition to these basic requirements, new CCR surface impoundments have additional criteria that must be meet, such as determining compliance with the GWPS of Part 845.600(b), since they will not have already established a monitoring program consistent with Part 257. This proposed Section stipulates that owners and operators of CCR surface impoundments, in the event of a release, must control the source of the release immediately and begin appropriate corrective action as required by this Subpart.

Proposed Section 845.610 also establishes an annual groundwater monitoring and corrective action reporting requirement. The annual report must be submitted by January 31st of

the year following the year that is the subject of the report. Each annual report must contain map(s) displaying the CCR surface impoundment, the locations of monitoring wells in the monitoring system and the potentiometric surface information collected during the year. The annual report must also identify any changes to the groundwater monitoring system and provide a discussion of the sampling and any exceedences of the applicable GWPS. At the beginning of each annual report a summary section is required. The summary section must provide an evaluation of the monitoring completed regarding any exceedences of GWPS, or background concentrations. The summary must also provide information, if applicable to the CCR surface impoundment, about the initiation or progress of any corrective action, and the type of remedy that was selected.

Section 845.620 Hydrogeologic Site Characterization

Proposed Section 845.620 provides a detailed list of the minimum required information that must be included in a hydrogeologic site characterization. The hydrogeologic site characterization will incorporate existing information from publicly available data sources and maps, in addition to site specific information derived from borings, monitoring and analyses performed specifically for the hydrogeologic site characterization, or other previously existing site investigations. The hydrogeologic site characterization will pull together information about surficial and subsurface geologic characteristics, and proximity of surface water bodies and the characteristics (e.g. flow and quality) of groundwater, which can be used for the development or modification of groundwater monitoring systems or the development and implementation of effective corrective action programs.

Section 845.630 Groundwater Monitoring System

Proposed Section 845.630 lays out the requirements of a groundwater monitoring system that can adequately monitor groundwater at a CCR surface impoundment. The groundwater monitoring system must be able to produce groundwater samples that represent groundwater which has not been impacted by a landfill or surface impoundment containing CCR. The system must also accurately represent groundwater quality as it passes the down gradient waste boundary. At a minimum a groundwater monitoring system must be composed of one up gradient and three down gradient monitoring wells, though more may be necessary. Separate groundwater systems are not required for each CCR surface impoundment if a release from any one of the CCR surface impoundments can be detected by the same groundwater monitoring system. The appropriate location, number and construction characteristics of the groundwater monitoring system's wells at a facility, whether for individual CCR surface impoundments or multiple CCR surface impoundments, will be dependent upon site specific hydrogeologic conditions as described in the hydrogeologic site characterization and the geometry of the CCR surface impoundment(s) at the facility. Owners and operators must obtain a certification from a qualified professional engineer that the groundwater monitoring system meets the requirements of proposed 845.630 and the certification must be submitted to the Agency with the applicable permit application. This proposed Section does not prohibit the use of an existing groundwater monitoring system to meet the requirements of this Part, but also does not preclude the Agency from requiring additional monitoring wells to supplement any existing system.

Section 845.640 Groundwater Sampling and Analysis Requirements

Proposed Section 845.640 describes the minimum sampling and analytical requirements that must be followed by all owners and operators and lays out how the analytical results must be

utilized. This Section requires that owners and operators have a sampling and analysis plan. The plan must include procedures and techniques for sample collection, preservation, shipment and chain of custody. Proper procedures and techniques are required to assure sample quality. The plan must also include analytical procedures and quality assurance and quality control. Analytical procedures must be applicable to the type of samples being collected. Quality assurance and quality control allows an evaluation of detections in samples to help determine if the detection is present in groundwater or may have resulted from cross contamination. Analytical methods used must be appropriate for groundwater samples and must include all of the constituents for which monitoring is required. This proposed rule requires sampling and analysis of total metals, with no field filtration. The proposed rule also requires use of a certified laboratory to assure accurate analytical results. Prior to sample collection, water levels must be measured so that groundwater elevation and hence the direction and rate of groundwater flow can be determined. Groundwater levels must be measured in all monitoring wells in a short enough time frame to preclude the likelihood that groundwater flow direction will shift during the sampling event.

The groundwater sampling and analysis plan must include the establishment of background groundwater quality. Background groundwater quality is vital to any groundwater sampling and analysis plan. Without an understanding of the groundwater quality that is flowing onto a facility and beneath the CCR surface impoundment(s), and owner or operator can't accurately determine if or to what extent a CCR surface impoundment is impacting groundwater. The establishment of background necessarily includes the application of statistical methods to the analytical results. Since the quality of groundwater is known to have natural variations both spatially and temporally, statistics must be applied to the measured analytical results to estimate

the total possible variation that could be expected. Statistics are applied because no groundwater system can produce samples from all upgradient locations for all times. Therefore, a representative sample that can also account for seasonality is used as a reasonable substitute. The concentrations at which constituents occur, their minimum concentrations of detection, the range of variability and distribution of the analytical results are also factors. While acceptable statistical methods vary in the way they represent the likely variability in groundwater quality, all the statistical methods must be able to approximate actual conditions within a specified margin of error. The statistical calculations are used to determine if a statistically significant increase over background has occurred. This comparison will be between background groundwater quality and groundwater quality down gradient of the CCR surface impoundment(s). The determination of statistical significance must be performed within 60 days of each sampling event.

Section 845.650 Groundwater Monitoring Program

This proposed Section provides the sampling frequency, the constituents that must be monitored and specifies the procedures that must be followed if apparent exceedences of the groundwater protection standards are reported. All CCR surface impoundments subject to Section 845.600 will have a minimum of a quarterly monitoring frequency for the active life of the CCR surface impoundment. A quarterly monitoring frequency was proposed because changes in groundwater quality could be detected within a relatively short time frame, quarterly samples will reflect seasonal variations in groundwater quality and four sampling events per year is not overly burdensome for owners and operators of CCR surface impoundments. Existing CCR surface impoundments must collect at least eight samples from each monitoring well no later than 180 days after the effective date of this proposed rule. This requirement does not

preclude the use of existing groundwater quality data from an existing CCR surface impoundment groundwater monitoring system. The use of existing data from existing monitoring wells for the calculation of background groundwater quality would be subject to Agency review as part of the initial operating permit. New CCR surface impoundments must also collect at least eight samples from each monitoring well no later than 180 days after groundwater monitoring begins. While 180 days does not provide the full range of seasonality, it is consistent with the requirements of 40 CFR Part 257. The collection of eight samples and quarterly monitoring are both contingent on the number of samples and the monitoring frequency being compatible with the selected statistical method(s).

A confirmed detection in excess of the any GWPS standard listed in proposed 845.600 results in a series of required actions, unless an alternative source demonstration is made by the CCR surface impoundment owner or operator. The owner or operator of a CCR surface impoundment has 60 days from the detected exceedence of a GWPS to submit a demonstration that a source other than the monitored CCR surface impoundment(s) is the source of the release and that the monitored CCR surface impoundment(s) didn't contribute to the detected contamination, or that the exceedence resulted from other factors such as sampling or analysis error, or natural change in groundwater quality or flow direction. The Agency must either concur or not concur with the demonstration within 30 days. If the Agency concurs with the demonstration, the owner or operator must include the demonstration in the annual groundwater monitoring and corrective action report, with a certification from a qualified professional engineer.

The owner or operator must notify the Agency of an exceedence of GWPS and the constituent(s) for which an exceedence occurred. If an alternative source demonstration is not

provided, the owner or operator must characterize the nature and extent or the release and relevant site conditions that may ultimately impact the remedy selected. The characterization must be sufficient to support the assessment of correct measures required by proposed 845.660. The characterization must be submitted to the Agency and added to the facility's operating record. At a minimum the characterization must include additional monitoring wells required to define the contaminant plume, collect information regarding the nature and amount of the material released, including constituents listed in proposed 845.600, install at least one additional well at the done gradient facility property boundary, and notify anyone who owns or lives on land immediately above the plume of contamination. The notifications to off-site landowners must be provided to the Agency and entered into the facility's operating record. Within 90 days after a detected exceedence of a GWPS, the owner or operator of a CCR surface impoundment must initiate an assessment of corrective measure, if the Agency has not concurred with an alternative source demonstration.

Section 845.660 Assessment of Corrective Measures

This proposed Section describes the requirements the owner or operator of a CCR surface impoundment must follow to assess corrective measures. The assessment of corrective measures must be initiated within 90 days of detecting an exceedence of a GWPS and immediately upon detection of a release from the CCR surface impoundment. This subsection is intended to distinguish between a long-term release to groundwater and a sudden catastrophic release to the surface. In both instances correct measures are required by the proposed rule, however, the relatively slow movement of groundwater versus an unexpected breach or overflow of a CCR surface impoundment necessitate different responses and response time frames. Once an assessment of corrective measures has been initiated, it must be completed and submitted to the

Agency for review with 90 days. The completion of the assessment of corrective measures may be extended by a maximum of 60 days, but only with the certification of a qualified professional engineer and the Agency's approval. The Agency must approve or disapprove the request for a time extension within 30 days. The demonstration and certification must be included in the annual groundwater monitoring and corrective action report.

The assessment of corrective measures must include an evaluation of the effectiveness of the potential corrective measures in meeting the requirements of a corrective action plan as described in proposed 845.670. As a minimum, all of the following factors must be included in an assessment of corrective measures. The performance, reliability, ease of implementation, and any potential impacts from the potential remedies; the time required to begin and complete the corrective action plan for a potential remedy; and any institution requirements such as permitting, and environmental and public health considerations that may impact implementation of a corrective action plan. The owner or operator must discuss the results of the assessment of corrective measures at least 30 days prior to the selection of a remedy at a public meeting with interested and affected parties as required by proposed 845.240. If the owner or operator of a CCR surface impoundment is completing closure and corrective action together, the requirements of this subsection and 845.710 may be combined.

Section 845.670 Corrective Action Plan

This proposed Section provides the time frame for implementing a corrective action, the required elements that must be included, the considerations that must be included, an evaluation of the effectiveness of the remedy, the ease or difficulty of implementation and must provide an anticipated schedule for implementing and completing the remedy in consideration of site specific conditions.

Within one year of completing the assessment of corrective measures a corrective action plan, which identifies the selected remedy must be submitted to the Agency in a construction permit application. While a remedy is being selected, the owner or operator must submit a semiannual report of the progress being made.

The corrective action plan must be based on the assessment of corrective measures, meet environmental and public health standards, include an alternatives analysis and contain an implementation schedule. The standards for the protection of the environment and public health include control of releases to the maximum extent feasible to eliminate future releases, remove as much released material as feasible, attain the GWPS of proposed 845.600, avoid inappropriate disturbances to sensitive areas.

The alternatives analysis for a corrective action plan must consider short and long-term effectiveness along with degree of certainty a remedy will be successful, the magnitude of risk reduction and reduction in the risk of future releases. The alternatives analysis must also assess any short-term risks to the local community and the environment from the excavation, transportation and re-disposal of wastes, and the type and degree of long-term management required by the potential remedies. Also evaluated is the time required to achieve GWPS, the potential for human and environmental exposures of remaining waste, the long-term reliability of each remedy and the potential that a remedy may have to be replaced. Other factors considered in the alternatives analysis are the availability of treatment technologies, the degree of difficulty in constructing the technologies used and the reliability of that technology. As related to technology, the need for permits from other agencies, the availability of equipment and required specialists, available treatment, storage and disposal services, and the degree to which potential remedies address community concerns.

When establishing the implementation and completion schedule for a corrective action plan, the owner or operator must consider the nature and extent of the contamination, the likelihood that a remedy will achieve the GWPS, availability of treatment and disposal capacity and the potential risks of human and environmental exposure during the corrective action. The resource value of the local aquifer must also be evaluated including; current and potential use and future groundwater use, proximity and rate of withdrawal by current users, groundwater quantity and quality, potential impacts to ecosystems or structures exposed to CCR constituents, hydrogeologic characteristics of the area and the availability of alternative water supplies.

Section 845.680 Implementation of the Corrective Action Plan

This proposed subsection establishes the time frame to implement a corrective action plan, establishes the need to assess whether any interim measures are necessary during corrective action implementation and establishes the requirement for an owner or operator to submit a corrective action completion report at the end of corrective action.

The owner or operator must implement the corrective action within 90 days of the Agency's approval of the plan. The corrective action plan must include a groundwater monitoring program that meets the requirements of proposed 845.650, demonstrates the effectiveness of the remedy and can demonstrate compliance with the GWPS.

Owners and operators may need to take interim measures, before or during the implementation of the corrective action depending upon the time required to develop and implement a final remedy, the risk of exposure to human and ecological receptors and ecosystems, the potential of further groundwater degradation, weather conditions that may cause additional releases, the potential failure of containers or systems that may cause exposure and other threats to human health or the environment. Should the Agency or the owner or operator determine that the

corrective action is not functioning as predicted, the owner or operator must implement additional or different corrective actions that will reasonably achieve compliance.

A corrective action is complete when all of the required actions have been taken, and the GWPS has been met in all parts of the plume for three consecutive years. After completion of a corrective action the owner or operator must submit a corrective action completion report to the Agency. The completion report will include all the supporting engineering and hydrogeologic data, an implementation summary, groundwater monitoring data demonstrating compliance, documentation of how wastes were managed, compliance with the corrective action plan schedule and any other information relied upon for the closure certification by a qualified professional engineer. The engineer's certification must attest that the corrective action plan was completed in compliance with this proposed Section. The corrective action completion report and the engineer's certification must be placed in the facility's operating record.

ATTACMENT 1

Lynn E. Dunaway
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Professional Experience

Illinois Environmental Protection Agency **February 1988 to Present**
Bureau of Water
Division of Public Water Supplies
Groundwater Section
Springfield, Illinois

Environmental Protection Specialist IV **March, 2017 to Present**
Duties include: Currently in this position: provide review and technical input on hydrogeologic assessments and reports to all Bureau of Water Programs and Office of Emergency Response on groundwater issues; regularly respond to questions concerning the Illinois Environmental Protection Act (Act) and associated regulations, from the public, press, other governmental bodies and industry; review and respond to documents submitted pursuant to the regulations; remedial project management at facilities under Bureau of Water permits and unpermitted sites; assist with the development of regulations in support of the Act including testimony before the Illinois Pollution Control Board (Board) and at public hearings; provide technical input for special projects requiring geologic expertise, including pre-trial documents and testimony in court and before the Board; design and routine maintenance of tracking logs and data bases for the support of various groundwater programs; assist in the preparation of routine reports concerning various aspects of the States groundwater protection programs; Participate as mentor in the Graduate Public Service Internship (GPSI) program and the Governor's Environmental Corp (GEC) program.

Environmental Protection Specialist III **April, 1991 to March 2017**
Duties include: Currently in this position: provide review and technical input on hydrogeologic assessments and reports to all Bureau of Water Programs and Office of Emergency Response on groundwater issues; regularly respond to questions concerning the Act and associated regulations, from the public, press, other governmental bodies and industry; review and respond to documents submitted pursuant to the regulations; remedial project management at facilities under Bureau of Water permits and unpermitted sites; assist with the development of regulations in support of the Act including testimony before the Board and at public hearings; provide technical input for special projects requiring geologic expertise, including pre-trial documents and testimony in court and before the Board; design and routine maintenance of tracking logs and data bases for the support of various groundwater programs; assist in the preparation of routine reports concerning various aspects of the States groundwater protection programs; assist in the design of a data base to track and enhance compliance with the regulations

under the Act; Participate as mentor in the GPSI program and the GEC program; Temporary assignment as Unit Supervisor during supervisor's absence.

Environmental Protection Specialist II **June, 1989 to April, 1991**
Duties include: the quality control process used for the Sections ambient groundwater monitoring programs before entry into the SAFE system for periodic transfer to the STORET data base; use the SAFE System; use of the STORET System; assist with the development of regulations in support of the Illinois Groundwater Protection Act (Act); regularly respond to questions concerning the Act; provide technical review of assessments submitted to the Section; provide technical input for special projects requiring geologic expertise; lead worker for the Agency's first Draft submittal for approval of the (WHPP); assist in the preparation of routine combined section 106/319 grant reports; design and routine maintenance of tracking logs and data bases for the support of various groundwater programs; assist in the preparation of routine reports concerning various aspects of the States groundwater protection programs.

Environmental Protection Specialist I **February, 1988 to June, 1989**
Duties include: learn the quality control process used for the Sections ambient groundwater monitoring programs before entry into the SAFE System for periodic transfer to the STORET data base; learn to use the SAFE System; occasionally respond to questions concerning the Act; provide technical input for special projects requiring geologic expertise; routine maintenance of tracking logs for the support of various groundwater programs; assist in the preparation of routine reports concerning various aspects of the States groundwater protection programs.

Analytical Logging Inc. **August, 1982 to January, 1986**
Shreveport Louisiana
South Texas District
Corpus Christi, Texas

Lead Well Site Geologist **March, 1984 to January, 1986**
Duties Included: over site of a two or three man team; provide daily progress reports summarizing drilling activities and important hydrocarbon detections to field office and home office geologists and engineers; correlation and interpretation of geophysical logs; geologic evaluation of lithologic samples to determine geologic formation and hydrocarbon potential; packed column gas chromatography for hydrocarbon analysis; evaluation techniques to predict high pressure zones; routine maintenance of all systems utilized; creating a graphical representation correlating the geology, drilling parameters and hydrocarbon detections for each well.

Well Site Geologist **August, 1982 to February, 1984**
Duties Included: correlation and interpretation of geophysical logs; geologic evaluation of lithologic samples to determine geologic formation and hydrocarbon potential; assist with packed column gas chromatography for hydrocarbon analysis; learn evaluation techniques to predict high pressure zones; learn routine maintenance of all systems

utilized; creating a graphical representation correlating the geology, drilling parameters and hydrocarbon detections for each well.

Other Work Experience

Grain/ Livestock Farm Hand	**February 1986 to July 1986 and October 1987 to December 1987**
Shipping/Receiving Clerk	**August 1986 to November 1986**
Agrichemical Service Company Laborer	**March 1987 to June 1987**
Meat Packing Company Laborer	**July 1987 to September 1987**

Education and Training

Bradley University **August, 1978 to May, 1982**
Peoria, Illinois
Bachelor of Science; Geology

Northern Illinois University **May, 1982 to July, 1982**
Dekalb, Illinois
Post-graduate work; Field Mapping of the Black Hills Region, South Dakota

USEPA Groundwater Monitoring and Restoration **June 1 & 2, 1993**
Short course on behavior of DNAPLs in the subsurface and case studies

USEPA Risk Assessment Guidance for Superfund **October 18-21, 1993**
Environmental response training and case studies

Computer Modeling for Groundwater Systems **August 21, to December 16, 1995**
Basis of groundwater models, Dr. Larry Barrows, Illinois State University

Applied Ground Water Statistics for Landfills Short Course **July 8 & 9, 1997**
Statistical techniques for detection and compliance monitoring

Statistical Methods in Water Resources **August 6-10, 2001**
Application of statistical methods, University of Illinois, Springfield

Ozark Underground Laboratory Karst Short Course **March 12, 2003**
Unique features and case studies in karst geologic settings

Aqueous Geochemistry for Environmental Regulators **March 9 & 10, 2004**
Short Course by Dr. Stephen Van der Hoven, Illinois State University

Overview of Environmental Geophysics **May 6, 2004**
Review of common equipment advantages/disadvantages, by USEPA and Tetra Tech.

Geotechnology for Non-Engineers **April 20, 2005**
Key principles and concepts of Geotechnolgy, by Dr. Timothy Stark, University of Illinois

Fate and Transport Processes and Models **March 29 & 30, 2006**
Key elements of transport, models & assumptions, by Dr. Atul Salhotra, RAM, Inc.

Introduction to ArcGIS I **March 10 & 11, 2008**
Introduction to the features and functions of ArcGIS and use thereof, by Carmen Maso', USEPA

National Groundwater Association Conference **June 26 & 27, 2012**
Day 1: Presentations of general interest for groundwater assessment and protection, Day 2: Presentations related to hydraulic fracturing and groundwater quality

The Environmental Sampling Field Course **August 21-24, 2012**
Classroom and field training collecting soil, surface water and groundwater samples, by David & Gillian Nielson

Practical Geophysics
for Engineering, Archeology and Hydrogeology **September 27 & 28, 2012**
Classroom and hands on field demonstrations of resistivity, seismic, down-hole logging, by Drs. Ismail, Larson and Young, Illinois State Geological Survey

Forty Hour Safety Training with Annual Eight Hour Refresher per 29 CFR 1910.120
Last refresher 3/7/2013

Licenses

Licensed Professional Geologist (Illinois) **March 31, 1998**

License Number: 196.000608
Expiration Date: March 31, 2021

IN THE MATTER OF:	)	
	)	R 2020-019
STANDARDS FOR THE DISPOSAL	)	
OF COAL COMBUSTION RESIDUALS	)	(Rulemaking - Water)
IN SURFACE IMPOUNDMENTS:	)	
PROPOSED NEW 35 ILL. ADM.	)	
CODE 845	)	

PRE-FILED TESTIMONY OF AMY ZIMMER

My name is Amy L. Zimmer. I am an Environmental Protection Geologist in the Hydrogeology and Compliance Unit, Groundwater Section, Public Water Supplies in the Illinois Environmental Protection Agency's (Agency) Bureau of Water. I have worked in the Groundwater Section for more than twenty years. My curriculum vitae is attached. My responsibilities include application of the Illinois Environmental Protection Act and the Illinois Pollution Control Board Rules. This includes sites regulated by the Bureau of Water and Title 35 Illinois Part 620 Groundwater Quality Standards. My responsibilities also include hydrogeologic characterization of aquifers utilized by community water supplies, developing conceptual and mathematical models of groundwater flow systems, and identifying groundwater flowpaths in order to define the wellhead protection areas of community water supply wells. In addition, I review and evaluate groundwater models and hydrogeologic data received from regulated sites and community water supplies and submitted to the Agency, including wastewater permits and mine permits, provide technical input for special projects requiring geologic expertise, and assist in the preparation of routine reports concerning various aspects of the state's groundwater protection program. I will present testimony and answer questions related to hydrogeologic site characterization, closure, and post-closure.

Subpart F Section 845.620 Hydrogeologic Site Characterization

The Agency proposed a hydrogeologic site characterization for all sites for which these proposed rules will be applicable. For new proposed units, this characterization is expected to take place prior to design of the groundwater monitoring system and the groundwater monitoring plan. The site characterization needs to be conducted prior to the design of the monitoring system and the monitoring plan because information from the characterization should be taken into account during the design of the system and plan. For instance, depth to groundwater, identification of stratigraphic units that may be contaminant migration pathways, and the direction of groundwater flow in the various stratigraphic units are important pieces of information needed for design of the groundwater monitoring system and monitoring plan. Review of direction of groundwater flow helps determine appropriate locations for up-gradient wells, down-gradient wells, and compliance wells for the unit(s). Identification of stratigraphic units that may be contaminant migration pathways is necessary so monitoring wells are screened at appropariate intervals during installation to monitor these potential contaminant pathways. For existing sites, the monitoring plan, monitoring system design, and hydrogeologic site characterization may have been conducted in a different order or conjunctively, but must still be submitted with the initial operating permit application. The Agency will evaluate the site characterization data for existing sites in relation to monitoring plan and monitoring system design. Any discrepancies noted between the site characterization data and proper designs of the monitoring systems and monitoring plans will be noted and missing data will requested and addressed.

Information gathered during the hydrogeologic site characterization is also an important component for development of a correction action plan, closure plan, or any groundwater modeling done to evaluate alternatives. The information is necessary in order to ensure the plans and

modeling correctly identify and minimize any impacts or potential impacts from the unit to surrounding groundwater.

Subpart G Section 845.700 Required Closure or Retrofit of CCR Surface Impoundments

Each surface impoundment will at some point need to be closed, either with ash left in place or with ash removed. Existing impoundments must cease having any type of waste placed and initiate closure if they do not meet compliance with the location restrictions in Section 845.700. An owner or operator who fails to complete and document the annual safety factor assessment and achievement of the minimum safety factors specified in Section 845.460 also must initiate closure. An existing unlined CCR surface impoundment is required to cease placement of waste and initiate closure or submit a construction permit application to retrofit the impoundment with an appropriate liner.

All surface impoundments required to initiate closure or electing to initiate closure rather than retrofit must immediately categorize the surface impoundment according to subsection (g) of Section 845.700 and then complete the closure alternatives analysis in Section 845.710. A construction permit application containing a final closure plan must be submitted according to the schedule in subsection (h) of Section 845.700.

The timeframes for closure of existing CCR surface impoundments are set up in stages so they do not all occur at once but are staggered. This is necessary due to the number of surface impoundments around the state and helps for management for facilities that have multiple impoundments and companies that have multiple facilities. The dates range from the effective date of this Part for surface impoundments that do not qualify for continued receipt of waste under 40 CFR 257.103. The second date is October 15, 2023 for CCR surface impoundments that have demonstrated that alternative disposal capacity is infeasible under 40 CFR 257.103. The owner or operator must cease placing waste by the end of the initial time extension or once alternative

capacity becomes available, whichever is sooner, but in no case later than October 15, 2023. Finally, for surface impoundments where the use of coal-fired power boilers has permanently ceased and the impoundments are 40 acres or smaller, the date for closure completion is October 17, 2023. For those impoundments greater than 40 acres, closure must be complete by October 17, 2028.

All CCR surface impoundments required to close under Section 845 must be prioritized into one of the seven categories listed in Section 845.700(g), with category 1 having the highest priority for closure. These categories take into account potential public exposure, threats to human health and the environment, environmental justice areas, and exceedances of groundwater protection standards at existing and inactive CCR surface impoundments. If an impoundment can be categorized into more than one category, the impoundment must be assigned to the highest priority category. If and owner\operator has more than one CCR surface impoundment that is required to close, the owner\operator shall close the impoundments in order of priority.

If an impoundment meets the criteria for Category 1, the owner\operator must take immediate steps to mitigate any impact to an existing potable water supply, and act to replace the water supply with a supply of equal of better quality\quantity within 30 days. The Agency may designate a CCR surface impoundment as Category 2 when:

minimum safety factors have failed to be documented;

compliance with location restrictions have not been demonstrated;

exceedance of a groundwater protection standard has migrated off-site; or

an emergency condition exists that creates an immediate danger to public health, welfare or the environment.

For purposes of environmental justice and this section, if any part of a facility falls within one mile of the census block group then the entire facility, including all of its CCR surface impoundments, shall be considered an area of environmental justice.

The Agency may designate a CCR surface impoundment as another category than the owner\operator when site-specific conditions contradict the category designation provided by the owner\operator.

Owners\operators must submit either a construction permit application containing and final closure plan or one to retrofit the impoundment by January 1, 2022 for Categories 1 through 4. For Category 5, the same must be submitted by July 1, 2022. For Categories 6 and 7, applications must be submitted by July 1, 2023. Staggering the application dates allows management of the large number of applications being submitted, for the CCR surface impoundments all over the state, by Agency technical staff. If an owner\operator is consolidating more than one impoundment, the application schedule for the highest priority surface impoundment is applicable. If a construction permit application is denied by the Agency, the owner\operator must submit a revised application addressing all identified deficiencies within 90 days, unless the denial is appealed. If the denial is appealed, a revised application must be submitted within 90 days after a final decision by the Illinois Pollution Control Board is rendered. A response to all deficiencies must be discussed in a public meeting held according to Section 845.240.

Subpart G Section 845.710 Closure Alternatives

Before closure of a CCR surface impoundment, including any lateral expansion, with a final cover or by removal, the owner\operator must complete a closure alternatives analysis. This analysis must take into account the short and long-tern effectiveness and protectiveness of the closure method, including analysis of the amount of reduction of existing risks, the magnitude of residual risks related to future releases, long-term management, short-term risks to the community or environment during closure, time until closure and post-closure care is complete, potential exposure of receptors to wastes, long-term reliability of engineering or institutional controls, including off-site, and the potential need for future corrective action of the closure alternative.

The analysis must also take into account the effectiveness of the closure method in controlling future releases, the difficulty of implementation of a potential closure method, and the concerns of residents within communities where the CCR will be handled, transported and disposed. The owner\operator must analyze complete removal of the CCR as one closure alternative in this analysis, including whether the facility has an onsite landfill with remaining capacity or the ability to construct and onsite landfill, and also any other closure method requested by the Agency. In addition, the analysis for each alternative must meet or exceed a class 4 estimate under the Association For the Advancement of Cost Engineering Classification Standard and contain groundwater contaminant transport modeling showing that the alternative will achieve applicable groundwater protection standards. This is necessary in order to ensure the level of detail needed in the analysis is included in order to achieve as accurate of an analysis as possible in order to choose an appropriate closure alternative.

The results of the closure analysis must be discussed in a public meeting held by the owner\operator at least 30 days prior to submission of a construction permit application. After the meeting, a final closure plan must be submitted to the Agency with the selected closure method, including all materials demonstrating completion of the analysis.

Subpart G Section 845.720 Closure Plan

The closure plan consists of a preliminary written closure plan and later a final written closure plan. This helps to take into account that the plans for closure may change during the duration of the life of the CCR surface impoundment.

The preliminary closure plan must be submitted to the Agency for new and existing CCR surface impoundments not required to close under Section 845.700 with the initial operating permit application. The content describes the steps to close the impoundment, including whether the closure will be completed through CCR removal and decontamination or leaving the CCR in place, a description of the final cover, maximum amount of CCR ever on-site, the largest ever

surface area of the impoundment, and a schedule for completion of all closure activities. If the owner\operator estimates that the time required to complete closure will exceed the timeframes in Section 845.760(a), the preliminary written closure plan must also include the site-specific information that would support any time extension sought under Section 845.760(b). All preliminary closure plans must be placed in the facility's operating record, and a professional engineer must certify that any preliminary closure plan meets the requirements of this Part.

Any amendments to the preliminary closure plan must be submitted with each operating permit renewal application. The owner\operator may amend the plan at any time; they must amend the plan whenever there is a change in operation that would substantially affect the closure plan or if unanticipated events necessitate a revision of the plan. The plan must be amended at least 60 days prior to a planned changed in the operation of the facility or impoundment or no later than 60 days after an unanticipated event requires the need to revise the plan.

The final closure plan must be submitted by the owner\operator as part of a construction permit application for closure before installation of the final cover or removal of CCR from the impoundment for the purpose of closure. The plan must identify the closure method, all of the information required in the preliminary closure plan, and the closure alternatives analysis in Section 845.710. If a revision of the final closure plan is needed after closure activities have started, a request must be submitted to modify the construction permit no later than 60 days after the triggering event. The final closure plan must also be certified by a professional engineer.

Subpart G Section 845.730 Initiation of Closure

Closure activities must commence no later than the applicable timeframes. Closure has been initiated if the owner\operator has ceased placing waste in the CCR surface impoundment and has submitted to the Agency a closure construction permit application. The owner\operator must initiate closure of an impoundment no later than 30 days after the date on which the

impoundment either receives the final placement of waste or removes the final volume of CCR for the purpose of beneficial use.

For temporarily idled CCR surface impoundments, the owner\operator must initiate closure of the impoundment that is not receiving waste or removing CCR for the purpose of beneficial use within two years of the last receipt of waste or last removal of CCR material for beneficial use. However, the owner or operator may secure another two years to initiate closure if the Agency approves a written demonstration that the CCR surface impoundment will continue to accept wastes or will start removing CCR for beneficial use. The demonstration must contain supporting documentation including that the impoundment has remaining disposal capacity or can have CCR removed for beneficial reuse, and information that there is a reasonable likelihood that the impoundment will resume receiving waste streams in the future of that CCR can be removed for use, including estimations of when this is expected to occur.

Each Agency- approved demonstration must be placed in the facility's operating record. The owner or operator may seek more than one two-year time extension for an impoundment. A notification of intent to close for a CCR surface impoundment must be placed in the facility's operating record no later than the ate closure is initiated.

Subpart G Section 845.740 Closure by Removal

Closure by removal is complete when all CCR has been removed from the impoundment and all areas affected by releases from the impoundment have been decontaminated. After removal is completed, groundwater monitoring must continue pursuant to Subpart F for three years after closure or for three years after the monitoring does not show and exceedance of the groundwater protection standard, whichever is longer.

During closure by removal, the owner or operator must responsibly handle and transport the removed CCR. This includes manifests when transporting off-site by motor vehicle, train or

barge. It also includes the development of a transportation plan, including transportation method, frequency, time and routes of transport, measures to minimize noise, traffic, safety concerns, and fugitive dust, use of a vehicle washing station, means of covering CCR during transport, and a requirement that for motor vehicle transport, a permitted special waste hauler is used. At the facility, the owner or operator must implement onsite dust controls, utilize dust suppressants, and handle CCR in ways to minimize particulates and offsite particulate movement.

The owner or operator must provide public notices explaining the hazards of dust inhalation, one at the entrance, and another to local governments through which the CCR will be transported, this one including the transportation plan and schedule.

Measures must be taken to prevent contamination of surface water, groundwater, soil and sediments from CCR during removal. CCR may be stored temporarily during removal in either a lined landfill, a CCR surface impoundment, an enclosed structure or a storage pile. A CCR storage pile must be tarped or have wind barriers, limit stormwater contact, be wetted or have application of dust suppressants, have a storage pad or an appropriate geomembrane liner, have fixed and mobile berms where appropriate, and have a groundwater monitoring system for groundwater protection.

General housekeeping must also be done during cleanup by removal, including daily cleanup of CCR, truck tarping, maintenance of the pad and equipment and general good practices during loading and unloading. The amount of time the CCR is exposed to precipitation and wind must be minimized, a Stormwater Pollution Prevention Plan must be developed and implemented, and any stormwater coming in contact with CCR must be discharged via an NPDES permit.

A monthly report must be prepared and placed in the facility operating record during removal describing the weather, precipitation, amount of CCR removed, amount and location of CCR stored onsite, amount of CCR transported offsite, implementation of good housekeeping practices, implementation of dust control measures, and documentation of worker safety measures

implementation. Upon completion of removal and decontamination of CCR, a completion report and certification from a professional engineer that the removal and decontamination has been completed in accordance with this Section must be submitted. They must also be placed in the facility's operating report. Upon completion of groundwater monitoring, the owner or operator of the CCR surface impoundment must submit a completion of groundwater monitoring report and certification from a professional engineer that groundwater monitoring has been completed in accordance with this Section, and they also must be placed in the facility's operating record.

Subpart G Section 845.750 Closure with a Final Cover System

This section outlines the performance standard when closing with leaving CCR in place. The CCR impoundment must be closed in a manner that will control, minimize, or eliminate, as much as feasible, post-closure infiltration of liquids and also releases of CCR, leachate, or contaminated run-off. It must preclude the probability of future impoundment of water, sediment, or slurry, include measures that provide for major slope stability, minimize the need for further maintenance of the impoundment, and be completed in the shortest amount of time consistent with generally accepted engineering practices. The owner or operator of a CCR surface impoundment or lateral expansion must eliminate free liquids by removing liquid wastes or solidifying the remaining wastes and residues, and remaining wastes must be stabilized sufficiently to support the final cover system.

The final cover system must consist of a low permeability and a final protective layer. The design must be included in the preliminary and final written closure plans and the construction permit application for closure. The following standards for the low permeability layer must be met, unless the owner or operator demonstrates that another construction technique or material provides equivalent or superior performance and is approved by the Agency. For the low permeability layer, the standards for a compacted earth layer is three feet and a hydraulic conductivity of $1x\ 10^{-7}$ cm/sec or less. The standards for a geomembrane are a thickness of 40 mil, a hydraulic flux equivalent or superior to a 3

foot layer with a hydraulic conductivity of 1x 10^{-7} cm/sec, strength to withstand the normal stresses imposed by the waste stabilization process, and be placed over a prepared base free from sharp objects and materials that may cause damage.

The following standards for the final cover system must be met, unless the owner or operator demonstrates that another construction technique or material provides equivalent or superior performance and is approved by the Agency. Standards for the final protective layer are that is must cover the entire low permeability layer, be at least three feet thick and sufficient to protect the low permeability layer from freezing, minimize root penetration of the low permeability layer, consist of soil capable of supporting vegetation, be placed a soon as possible after placement of the low permeability layer, and be covered with vegetation to minimize wind and water erosion. The final cover system must be designed to accommodate settling and subsidence to minimize disruption of the integrity of the final cover system. A professional engineer must certify that the final cover system meets the requirements of this section.

CCR may be placed in surface impoundments for the purposes of grading and contouring in the design of the final cover system as long as the CCR placed has been generated at the facility and was located at the facility at the time of closure initiation, CCR must be placed above the elevation of CCR in the impoundment following dewatering and stabilization, and the CCR must be placed entirely within the perimeter of the berms of the impoundment. The final cover system must be constructed with either a slope no steeper than 5% grade after allowance for settlement, or if at a steeper grade, the Agency determines the steeper slope is necessary based on conditions at the site to facilitate runoff and minimize erosion, and side slopes are evaluated for erosion potential based on a stability analysis.

Subpart G Section 845.760 Completion of Closure Activities

The owner or operator of a CCR surface impoundment must complete closure of existing, new and any expansion of an impoundment within the timeframe approved by the Agency in the final

closure plan or within five years of obtaining a construction plan for closure, whichever is less. Extensions to the timeframes for completion of closure may be granted if the owner or operator has demonstrated to the Agency that it is not feasible to complete closure of the impoundment within the required timeframe due to factors beyond the facility's control. The demonstration must include a discussion explaining why the additional time is needed and submitted to the Agency with a renewal construction permit application for closure. Factors that may support a demonstration for a time extension include complications stemming from climate and weather, time required to dewater an impoundment, the geology of the area around the impoundment affecting the amount of material need to close, or time required to gain necessary approvals and permits from the Agency or other agencies.

The maximum time extension for impoundments of 40 acres or less that are not closing by removal is two years. CCR surface impoundments greater than 40 acres not closing by removal may extend the timeframe for completion of closure in two-year increments, with a demonstration of need for each extension. The maximum number of two-year extensions that may be obtained is five. CCR surface impoundments closing by removal may also extend the time to complete closure multiple times, in two-year increments. Each request for an extension must also include a demonstration of need. The owner or operator must certify that the information in each demonstration is true, accurate and complete.

Upon completion of all closure activities, the owner or operator must submit to the Agency a closure report and closure certification. The closure report must include all engineering and hydrogeology reports, including all CQA reports and certifications, photographs of the final cover system and any groundwater collection system, a written summary of closure requirements and activities, and any other information relied upon by the professional engineer in making the closure certification. The closure certification must include a statement that closure has been completed in accordance with the Agency-approved final closure plan, and the report must be placed in the facility's operating record. Within thirty days of the Agency's approval of the submitted closure report and

closure certification, the owner/operator must prepare a notification of closure of the impoundment. This notification must include the above certification and also be placed in the facility's operating record. If closure has been completed before the effective date of this Part, the owner or operator must notify the Agency of completion of closure by September 30, 2021, if such notifications have not been submitted previously.

Following closure of a CCR surface impoundment, the owner or operator must record a notation on the deed of the property in perpetuity in order to notify an potential purchaser of the property that the land has been used as a CCR surface impoundment, and that's its use is restricted under the post-closure care requirements as provided by Section 845.780(d)(1)(C) or groundwater monitoring requirements in Section 845.740(b). Within 30 days of recording a deed notation, the owner or operator must submit to the Agency a notification stating that the notation has been recorded and place the notification in the facility's operating record.

Subpart G Section 845.770 Retrofitting

In order to retrofit a CCR surface impoundment, the owner or operator must remove all CCR, including any liners, contaminated soils and sediments, and then install a liner and leachate collection system according to Sections 845.410 and 845.420. The impoundment, however, would remain subject to all other requirements of this Part, including the requirement to conduct any corrective action necessary. The written retrofit plan must include a description of the measures that will be taken to retrofit the impoundment, a description of the procedures to remove all CCR, liners, and contaminated soils and sediments, an estimate of the maximum amount of CCR and other contaminated materials that will be removed as part of the retrofit, an estimate of the largest area of the impoundment that will be affected by the retrofit, and a schedule for completing all activities necessary to complete the retrofit, including an estimate of the year in which the retrofit activities will be completed.

The written retrofit plan must be submitted with the construction permit application, and a

construction permit must be obtained before retrofitting may begin. An owner or operator may submit a permit modification application at any time to amend the initial of any subsequent written retrofit plan. The owner or operator must seek to amend the retrofit plan whenever there is a change in the operator of the CCR surface impoundment that would substantially alter the plan, or when unanticipated events make a revision of the written retrofit plan necessary. For a planned change in the operation of the facility or impoundment, the owner or operator must seek to amend the retrofit plan at least 60 days prior to the planned change. For an unanticipated event requiring a change to the retrofit plan, the owner or operator must seek to amend the plan no later than 60 days after the event. If the plan needs to be revised after retrofit activities have commenced, the owner or operator must submit and request to modify the construction permit no later than 60 days after the triggering event. A professional engineer must certify that all activities in the written retrofit plan or any amendment to the plan meet the requirements of this Section. The owner/operator must prepare a notification of intent to retrofit a CCR surface impoundment to later than the date a construction permit application for retrofitting is submitted to the Agency. This notification must also be placed in the facility's operating record. If CCR is removed from the impoundment as part of retrofitting activities, the handling and removal of CCR must follow the requirements in Section 845.740. The deadline for completion of retrofitting a CCR surface impoundment is the timeframe approved by the Agency in the retrofit plan, or within five years of obtaining a construction permit, whoever is less. For extension of the retrofit timeframes, the same procedures apply as specified in Section 845.760 (b).

Upon completion of all retrofit activities, the owner or operator must submit to the Agency a retrofit completion report and certification. The report must include all engineering and hydrogeology reports, including all CQA reports and certifications, photographs of the liner system and leachate collection system, a written summary of retrofit requirements and activities, and any other information relied upon by the professional engineer in making the retrofit certification. The retrofit certification must include a statement that retrofit has been completed in accordance with the retrofit plan specified

in subsection (b) of this Section and the requirements of this Part, and the retrofit completion report must be placed in the facility's operating record. Within thirty days of the Agency's approval of the submitted retrofit completion report and certification, the owner/operator must prepare a notification of completion of retrofit activities for the impoundment. This notification must include the above certification and also be placed in the facility's operating record. At any time after initiation of retrofitting, the owner or operator may decide to cease retrofitting and seek to initiate closure of the impoundment instead in accordance with the requirements in Subpart G, and via an approved construction permit for closure.

Subpart G Section 845.780 Post-Closure Care Requirements

Post-closure care requirements apply to the owner and operators of CCR surface impoundments who have completed an Agency approved closure, with the exception of owners or operators of surface impoundments that has elected to close by removing CCR. Post-closure maintenance of CCR surface impoundments must consist of maintaining the integrity and effectiveness of the final cover system, maintaining the integrity and effectiveness of and operating the leachate collection system, if applicable, and maintaining and monitoring the groundwater monitoring system.

The post-closure care period is at least 30 years. At the end of 30 years, the owner or operator must continue post-closure care until groundwater monitoring data shows concentrations are below the groundwater protection standards in Section 845.600, and the concentrations are not increasing for the constituents over background, as long as the concentrations have been reduced to the maximum extent feasible and they are protective of human health and the environment.

The written post-closure care plan must contain a description of the required monitoring and maintenance activities, the name and contact information for the person to contact about the facility during the post-closure care period, and a description of the planned uses of the property during post-closure care. Use of the property during the post-closure care period shall not disturb the cover, liner,

the containment system, of the monitoring system unless necessary to comply with the requirements of this Part. Any other disturbance is allowed if the owner or operator demonstrates that it will not increase the potential threat of human health or the environment. The demonstration must be certified by a professional engineer.

The written post-closure care plan must be submitted to the Agency with its initial operating permit application. The owner or operator may submit an operating permit modification application to amend the initial or any subsequent written post-closure care plan at any time. The post-closure care plan must be amended when there is a change in the operation of the impoundment that would substantially affect the written post-closure care plan or if unanticipated events necessitate a revision of the written post-closure care plan after post-closure activities have commenced. The owner or operator must seek to amend the plan at least 60 days prior to a planned change in the operation of the facility or impoundment or no later than 60 days after an unanticipated event requires the need to revise an existing plan. If a plan is revised after post-closure activities have commenced, the owner or operator must submit a request to modify the operating permit no later than 30 days following the triggering event. A professional engineer must certify that the initial and any amendment to the written post-closure care plan meets the requirements of this Section.

Upon completion of the post-closure care period, the owner or operator must submit a request to the Agency, certified by a professional engineer, to end post-closure care. Within 30 days of the Agency's approval of the request, the owner or operator must prepare a notification of completion of post-closure care and place the notification in the facility's operating record.

ATTACHMENT 1

Amy L. Zimmer

Professional Experience

Illinois Environmental Protection Agency **August 1998 to Present**

Bureau of Water
Division of Public Water Supplies

Groundwater Section

Springfield, Illinois

Environmental Protection Geologist III **September 2000 to Present**

Duties include: Geologic investigations and hydrogeologic characterization of aquifers utilized by community water supplies. This includes development of conceptual and mathematical models of flow systems, application of the appropriate solution techniques and application of advective particle-tracking techniques to identify groundwater flowpaths. Regularly respond to questions concerning the Illinois Groundwater Protection Act, provide technical input for special projects requiring geologic expertise, and assist in the preparation of routine reports concerning various aspects of the state's groundwater protection programs. Provide technical review of assessments submitted to the Groundwater Section. This includes evaluation of groundwater models and hydrogeologic data received from regulated sites and community water supplies.

Environmental Protection Geologist II **August 1999 to September 2000**

Duties include: Geologic investigations and hydrogeologic characterization of aquifers utilized by community water supplies. This includes development of conceptual and mathematical models of flow systems, application of the appropriate solution techniques and application of advective particle-tracking techniques to identify groundwater flowpaths. Regularly respond to questions concerning the Illinois Groundwater Protection Act, provide technical input for special projects requiring geologic expertise, and assist in the preparation of routine reports concerning various aspects of the state's groundwater protection programs, including preparation of reports for Illinois'

Source Water Assessment Program. Provide technical review of assessments submitted to the Groundwater Section. This includes evaluation of groundwater models and hydrogeologic data received from regulated sites and community water supplies.

Environmental Protection Geologist I **August 1998 to August 1999**

Duties include: Geologic investigations and hydrogeologic characterization of aquifers utilized by community water supplies. This includes development of conceptual and mathematical models of flow systems, application of the appropriate solution techniques and application of advective particle-tracking techniques to identify groundwater flowpaths. Regularly respond to questions concerning the Illinois Groundwater Protection Act, provide technical review of assessments submitted to the Groundwater Section, provide technical input for special projects requiring geologic expertise, and assist in the preparation of routine reports concerning various aspects of the state's groundwater protection programs.

Department of Geology **August 1996 to May 1998**

Northern Illinois University
DeKalb, IL 60115

Teaching Assistant

Duties Include: Laboratory preparation, lecture presentation, and grading for introductory geology, geomorphology, mineralogy, and sedimentary geology laboratories.

City of DeKalb, Water Division **May 1997 to August 1997**

1216 Market St.

DeKalb, IL 60115

Summer Intern

Duties Include: Assistance with literature search and hydrogeologic investigations of the Troy Bedrock Valley as a potential municipal groundwater source. Field work included assisting with seismic refraction studies, test drilling, geophysical well logging, and pump tests.

Education

Northern Illinois University **August 1996 to May 1998**
Dekalb, Illinois

Post-graduate work

Northern Illinois University **August 1991 to December 1995**

Dekalb, Illinois

Bachelor of Science: Geology

Introduction to ArcGIS II **July 12-14, 2006**
Short course by Environmental Systems Research Institute, Inc.

Rockworks workshop **May 2 & 3, 2006**
Short course by Rockworks, Inc.

Interpolation and Contouring Environmental Data **November 29 & 30, 2005**

Short course by Dan Keefer, Illinois State Geological Survey

Geotechnology for Non-Engineers **April 20, 2005**
Key principles and concepts of geotechnolgy, by Dr. Timothy Stark, University of Illinois

Aqueous Geochemistry for Environmental Regulators **March 9 & 10, 2004**
Short course by Dr. Stephen Van der Hoven, Illinois State University

Introduction to ArcGIS I **December 18 & 19, 2003**
Short course by Environmental Systems Research Institute, Inc.

Statistical Methods in Water Resources **August 6-10, 2001**
Application of statistical methods, University of Illinois, Springfield

Unix Operating System **March 27 & 28, 2000**
Introduction, by Dr. David Doss, Illinois State University

Programming with Avenue **May 1999**
Short course by Environmental Systems Research Institute, Inc.

GMS Groundwater Modeling Course **February 17-19, 1999**
Short course by BOSS International

Fluid Flow in Carbonates: Interdisciplinary Approaches **September 20-24, 1998**
Society for Sedimentary Geology research conference

Introduction to ArcView GIS **August 25 & 26, 1998**
Short course by Environmental Systems Research Institute, Inc.

IN THE MATTER OF:	)	
	)	R 2020-019
STANDARDS FOR THE DISPOSAL	)	
OF COAL COMBUSTION RESIDUALS	)	(Rulemaking - Water)
IN SURFACE IMPOUNDMENTS:	)	
PROPOSED NEW 35 ILL. ADM.	)	
CODE 845	)	

PRE-FILED TESTIMONY OF LAUREN MARTIN

My name is Lauren Hunt Martin. I am an Environmental Protection Geologist I for the Illinois Environmental Protection Agency (Illinois EPA). I have a Bachelor of Science degree in geology from Western Illinois University and a Master of Science in hydrogeology from Illinois State University. I work in the Hydrogeology and Compliance Unit, Groundwater Section, Division of Public Water Supplies, Bureau of Water, Illinois Environmental Protection Agency. Since my start in the Groundwater Section in February, I have assisted in updating Part 845, especially Subsection E.

Prior to my employment at the Illinois EPA, I was employed at CH2M (acquired by Jacobs Engineering in 2018) from 2005 to January 2020 as a Geologist, Nicor Gas in the Summer of 2004 as a Reservoir Engineering Intern and at Whitney and Associates from 2001 to 2003 as an Engineering Geologist Intern and Engineering Geologist and Construction Inspector. My curriculum vitae (Attachment 1) is included for further detail about my training and experience. My duties in the Groundwater Section include: Providing review of hydrogeologic assessments and reports, and providing technical input on the same as well as special projects requiring geologic expertise; Providing geologic and hydrogeologic expertise to Bureau of Water permit programs (industrial, mines and municipal) and Public Water Supply permits; Responding to questions from the regulated community, public and other governmental agencies about the provisions of the Illinois Environmental Protection Act

("Act") and Illinois Pollution Control Board ("Board") rules adopted thereunder; Project management of sites subject to corrective actions under the Act or Board rules; Testifying before the Board on proposed rules; and assisting in the implementation of source water protection programs. My pre-filed testimony focuses on the Subsection E, specifically as it pertains to worker safety and/or implementation of worker safety as a preventative measure to prevent community contamination as presented in the proposed Part 845. I can explain my pre-filed testimony and answer additional questions as needed.

Air Criteria

Subpart E (Operating Criteria), Section 500 Air Criteria closely reiterates the Federal requirements in Part 257.80(a) through (c), air criteria. Additionally, it complies with other current state and federal air regulations especially OSHA worker safety regulations pertaining to air.

Preamble to Part 257, Section F Operating Criteria, states that fugitive dust should be limited to 35 ug/m^3 per 24-hour period or an alternative standard established under a State Implementation Plan (SIP). Section F states that wetting CCR is acceptable to prevent wind distribution and make optimal compaction possible.

Although the Preamble is not the actual regulation, other federal regulations, 29 CFR 1910 and 29 CFR 1926, provide air criteria requirements for site worker safety. Part 257 does not overrule or override worker safety protections. Worker safety protections when properly implemented will also protect the surrounding communities by controlling the hazards within the worksite. Worker safety protections on site, by extension, prevents the hazardous materials from traveling offsite in quantities that could impact the health and wellbeing of the surrounding community. In 845.500(b) Illinois EPA is addressing specific hazardous

substances that are found within the CCR materials. Specifically, these materials are arsenic, beryllium, lead, cadmium and silica.

29 CFR 1910.1018 addresses substance information, substance technical guidelines, hazard mitigation, and medical monitoring for arsenic. Illinois EPA cited this specific CFR because, according to Trace Elements of Fly Ash: Emissions from Coal Fired Steam Plants Equipped with Hotside and Coldsite Electrostatic Precipitators for Particulate Control published by the USEPA in 1978, arsenic is found in most CCR materials. The onus of proving that the arsenic is not present in quantities and particle sizes that can cause acute or chronic exposure symptoms in workers or the surrounding community is on the owner/operators of the CCR surface impoundment. Arsenic quantities in the air within the site operations must be documented by the facility to provide a record for due diligence and documentation to support or justify to not providing medical monitoring for arsenic as prescribed in 29 CFR 1910.1018 Appendix C.

29 CFR 1910.1024 addresses substance evaluation and hazard mitigation for beryllium. Illinois EPA cited this specific CFR because, according to the aforementioned USEPA publication from 1978, beryllium is found in a majority of CCR materials. In 29 CFR 1910.1024(a)(3) the owner or operators of CCR surface impoundments are required to provide objective data showing that beryllium at 0.1% weight of the CCR material and above is properly mitigated at the site. If the objective data shows that beryllium is not present above 0.1% of the weight of the material collected in an air monitoring device, then monitoring is not required because the exposure risk has been mitigated or was not present. Changes to the operations at the surface impoundment are recognized to require a reassessment of the risk potential and evaluation of the hazard associated with beryllium in the CCR materials. It is the

position of the Illinois EPA that operations that include exposed CCR materials or operations to cover, transport or otherwise manage CCR materials that do not have a permanent cap over the entire surface impoundment are encompassed by the 29 CFR 1910.1024 worker safety regulation regardless of industry type specifications. According to the aforementioned USEPA publication, when beryllium is present in the parent coal, beryllium becomes concentrated during the coal combustion power generation process and has the potential to exceed the weight limit in 29 CFR 1910.1024(a)(3); therefore the owner or operators must determine the beryllium content in airborne dust, no matter the particle size, at the CCR surface impoundment during each type of operational activity.

29 CFR 1910.1025 addresses lead containing materials hazard mitigation, engineering controls, administrative controls, and worker air quality and medical monitoring in general industry and refers all construction related activity to 29 CFR 1926.62, as 29 CFR 1926 is for construction related activities and subpart 62 is the hazard mitigation and monitoring requirements for lead exposure in construction.

29 CFR 1910.1027 addresses cadmium in materials within worksites for the purpose of hazard mitigation, engineering controls, administrative controls and worker air quality and medical monitoring in general industry. 29 CFR 1926.63 is referred to in 29 CFR 1910.1027, but is not found electronically filed in OSHA standards currently available online as of May 13, 2020. In lieu of 29 CFR 1926.63 not being available for reference, 29 CFR 1910.1027 should be utilized to the fullest extent possible to protect workers during site work because it applies to general industry.

29 CFR 1910.1053 addresses silica as a dust borne hazard in the workplace. Silica safety regulations were enacted in 2016 thus after Part 257 was entered into the Federal

Register. Illinois EPA expects that all parts of 29 CFR 1910.1053 and 29 CFR 1926.1153, the construction silica standard, will be implemented at each site for any and all work involving materials with a silica content of greater than 5% per unit weight. Proper characterization of silica content in CCR materials must be determined through laboratory analysis. In lieu of analytical data supporting site worker safety protocol, CCR materials should be assumed to be exceeding the silica per unit weight OSHA TWA (Hicks and Yager, 2006).

Emergency Action Plan

The Emergency Action Plan section was written verbatim to Part 257.73 with the exception of 845.520(c), 845.520(f) and 845.520(g). 845.520(c) is the state deadline for preparing the initial EAP of September 30, 2021. 845.520(f) requires the EAP to be put in the operating record. 845.520(g) requires documentation of a face to face meeting with first responders. Illinois EPA is requiring that the federal regulations be followed as well as minimum requirements for each site in Part 845.520.

Safety and Health Plan

Safety and Health Plans are required by 29 CFR 1910.120 and 29 CFR 1926.65. Illinois EPA is implementing specific requirements to either provide employees with safety data sheets for hazardous constituents within the CCR materials and other chemicals used during the operations of the CCR impoundment. Alternatively, the owner operators are allowed to create their own safety data sheets for their individual sites. Illinois EPA recognizes that sources for the parent materials vary at different sites throughout the operational history of each CCR impoundment, as such, safety data sheets created for one site are only applicable to that site and must be based on analytical data for airborne dust constituents, leachate constituents, groundwater chemicals and CCR materials found in the CCR surface impoundment.

References

Hicks, Jeffrey and Janice Yager. Airborne Crystalline Silica Concentrations at Coal-Fired Power Plants Associated with Coal Fly Ash. Journal of Occupational Environmental Hygiene. 3(8):448-55. August 2006.

United States Environmental Protection Agency (USEPA), Region VIII, Denver, Colorado. Trace Elements of Fly Ash: Emissions from Coal Fired Steam Plants Equipped with Hotside and Coldside Electrostatic Precipitators for Particulate Control. Radian Corporation. EPA 908/4-78-008. Decdember 1978

ATTACHMENT 1

CURRICULUM VITAE

Professional Experience

CURRICULUM VITA

LAUREN HUNT MARTIN, M.S.

1021 N Grand Avenue East

Springfield, Illinois 62704

Illinois Environmental Protection Agency

Bureau of Water

Division of Public Water Supplies

Groundwater Section

Springfield, Illinois

Environmental Protection Geologist I

February 2020 to Present

During the short time that I have been at the Illinois EPA, I have assisted in updates to the Part 845 regulation final draft and amendments to Part 620. As an Environmental Protection Geologist I, I have assisted in public water supply hydrogeologic compliance and Office of Emergency Response emergency response public water supply and groundwater and surface water evaluations. I am becoming involved as project manager for mines, industrial and municipal sites for ongoing support and decision making.

Jacobs Engineering (Formerly CH2M)

Chicago, Illinois

Geologist

August 2005 to January 2020

Subject Matter Expert, Bedrock Geology, Confidential Federal Client, Iowa, August 2016 to January 2020. Jacobs Engineering is performing the site investigation for a Remedial Investigation for a large active military installation. I was subject matter expert for the investigation into bedrock.

Task Coordinator and Technical Expert, Confidential State Client, Wisconsin, January 2017 to January 2020. Phase I Update for ongoing transportation design project. I wrote and consulted on the proposal and Phase I Update for the client deliverable.

Task Coordinator and Assistant Project Manager, LUST Site, Confidential Federal Client, Illinois, August 2017 to January 2020. Jacobs Engineering is performing the site investigation and corrective action for a LUST site in western Illinois at a former large active military installation. I was the task coordinator and assistant project manager.

Subject Matter Expert, Bedrock Geology, Confidential Federal Client, Iowa, August 2016 to January 2020. Jacobs Engineering is performing the site investigation for a Remedial Investigation for a large active military installation. I was the subject matter expert for the investigation into bedrock.

Task Coordinator and Technical Expert, Confidential State Client, Wisconsin, January 2017 to January 2020. Phase I Update for ongoing transportation design project. I wrote and consulted on the proposal and Phase I Update for the client deliverable.

Task Coordinator and Project Manager for H&S, Confidential Private Client, Cook and DuPage Counties, Illinois, 2012 to January 2020. Jacobs Engineering is the Design Corridor Manager for a premier transportation project for a confidential private client. I was the Task Coordinator various tasks including serving as the Project Manager for Safety concerns, coordinated the combined geotechnical and environmental field investigation at O'Hare International Airport in 2014 and the follow up environmental field investigation in 2016. I was the task manager for combining the geotechnical and environmental field investigation for the borrow source material along and near the project right of way including identifying design needs and environmental testing needs to comply with Clean Construction or Demolition Debris regulations. Coordination consisted of logistics for implementation of field work, work

planning, and reporting including coordinating with the client and guiding internal team to ensure design needs were met. Logistics included meeting with Chicago Department of Aviation, FAA, Illinois Tollway, Illinois Department of Transportation, and coordination of access and runway closures for the purpose of field events.

Project Manager and Task Manager, Confidential Private Client, Illinois, February 2008-December 2016. Project site is a liquids terminal near Chicago, Illinois. Site has had many spills of various chemicals over the years around loading racks for railcars and semi-trucks and docks for loading barges. I managed tasks and projects including proposals, emergency environmental compliance response, site remediation, and site characterization. Emergency compliance response included overseeing emergency soil removal actions and subsequent reporting and regulatory agency coordination. Site remediation included emergency spill clean-up, construction of a geomembrane, and mentoring of junior staff on implementing construction plans. Site characterization included installing wells, drilling boreholes, gauging NAPL, and collecting groundwater data requiring mitigation of a multitude of gases, chemicals and subsequent safety hazards associated with chlorinated solvents, petroleum products and proprietary chemicals.

Assistant Project Manager, Site Superintendent, Construction Quality Manager, and Site Safety and Health Officer, Confidential Federal Client, Illinois, September 2014 to September 2016. The Project included the remediation of a railyard within a former military base for arsenic bearing coal. I was the assistant project manager during work planning and reporting. During the construction phase, I was the site superintendent, construction quality manager, and site safety and health officer.

Technical Hydrogeology Lead, Confidential Federal Client, Illinois, August 2010 to July 2014. Project was a former Radar School for the military during WWII. I designed and implemented the technical approach for closure of the site. I wrote and presented environmental data findings and proposed plan to the public in the public meeting. The Site went to a No Further Action Record of Decision in 2013/2014.

Site Characterization Site Manager, Confidential Private Client, Middle East, January to July 2009. The Project involved the design of four new nuclear reactors and surrounding support

structures at two proposed sites. I provided oversight and review of project documents for the site characterization during the field investigation and work planning for four new nuclear reactors at two proposed sites. The field investigation included geotechnical, hydrogeologic, geologic, biologic, geophysical and meteorological data collection and analyses.

Geotechnical Field Investigation Lead, Confidential Private Client, Abu Dhabi, UAE, August to November 2008. The Programme was a $2+ billion Design/Build Tunneling Project for the City of Abu Dhabi in the United Arab Emirates. I led the field investigation of the tunnel design on behalf of the programme ensuring that the field documentation and laboratory testing was completed as per the tunneling and geotechnical engineer's specifications.

Field Team Member, Field Team Leader, and Task Lead Assistant, Confidential Power Plant, Confidential Location, May-August 2006 and December 2006 to February 2007. The Project involved the design of two new nuclear reactors and surrounding support structures at an existing nuclear power plant. I actively participated in and led various tasks during the Final Safety Analysis Report field work and report construction. Tasks included data collection, data validation, software validation, data analyses and task management.

Nicor 2004

Hudson Gas Storage Field, Hudson, Illinois

Reservoir Engineering Intern

I worked as a Reservoir Engineering Intern for the Summer of 2004 for Nicor. My work tasks included supervising the seismic survey crew for my thesis, learning Geographix Software, reducing and analyzing data from the well logs for the various gas storage fields.

Whitney and Associates, Inc.

Peoria, Illinois

Engineering Geologist and Construction Inspector

I performed various concrete, soils, and asphalt inspections at commercial and federal construction sites and minor construction tasks for development properties. I operated an IDOT and ASTM certified soils and concrete laboratory.

Education

Bachelor of Science, Geology, Western Illinois University

Master of Science, Hydrogeology, Illinois State University

Certifications

OSHA 10-hour Construction Safety Awareness, 2005

OSHA 30-hour Construction Safety, 2015

USACE Construction Quality Manager, 2015-2020

WHMIS Certification (safety certification required for environmental site work in Canada), 2010

Additional Training

OSHA HAZWOPER 40-hour Training, 2005; 8-hour Refresher Training, Annually 2006 to 2019

First Aid/CPR Training, Annually or Biannually 2005 to 2019

Munitions Safety Awareness, 2011

Bloodborne Pathogens, 2018

Dangerous Goods Shipping, 2017

Fire Extinguisher Use Training, 2018

Arsenic, 2018

Asbestos, 2005

Behavior Based loss Prevention Systems Training, 2007

Benzene, 2013

Electrical Safety, 2017

Ergonomics Training, 2005

Excavation Safety Training, 2005

Fall Protection Safety Training, 2005

Field Awareness Safety Training, 2005

Global Harmonization Training, 2013

Hand Safety, 2018

Hazard Communication Training, 2005

Ladder, 2005

Lead, 2016

Manual Lifting, 2016

Military Munitions Rule Training, 2018

Noise/Hearing Conservation, 2014

Personal Protective Equipment Training, 2018

Project Manager Health, Safety and Environment Training, 2013

Railroad Contractor Orientation Training, 2010

Railroad Education for Contractors (On-Track), 2010

Railroad Safety Online Training, 2013

Remediation Waste Management Training, 2018

Respirators-Level C, 2018

Various Site Safety Coordinator Trainings, every 3 years 2005-2018

Safety Stand Down Meeting Training, 2013

Smith System Small Vehicle Backing and Forward Motion Trainings, 2012

Subcontractor Management Training, 2010

Traffic Control Training, 2013

Waste Management Training, 2018

Publications

Peterson, Eric, Lauren I. Martin, and David Malone. Identification of Potential Vertical Gas Migration Pathways Above Gas Storage Reservoirs, World of Engineering, 2015.

IN THE MATTER OF:	)	
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PRE-FILED TESTIMONY OF CHRIS PRESSNALL

My name is Chris Pressnall. I am the Environmental Justice Coordinator for the Illinois Environmental Protection Agency. I have been the Environmental Justice Coordinator since 2017. Prior to becoming the Environmental Justice Coordinator, for approximately 19 years I was in the Illinois EPA Division of Legal serving as an air enforcement attorney. Part of my responsibilities as part of the Division of Legal Counsel was to provide legal support to the Agency's Environmental Justice Program. My curriculum vitae is attached. My current responsibilities include administration of the Illinois Environmental Protection Agency's Environmental Justice Program. This includes screening of regulated sources of pollution to determine if the source is located in an area of environmental justice concern. My responsibilities also include implementation of the Illinois EPA Environmental Justice Policy and the Illinois EPA Environmental Justice Public Participation Policy. In addition, I facilitate and am a member of the Illinois Commission on Environmental Justice. I will present testimony and answer questions related the environmental justice screening of coal ash impoundments.

Environmental Justice Screening of Coal Ash Impoundments

Environmental Justice is based on the principle that all people should be protected from environmental pollution and have the right to a clean and healthy environment. Environmental justice is the protection of the health of the people of Illinois and its environment, equity in the

administration of the State's environmental programs, and the provision of adequate opportunities for meaningful involvement of all people with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies.

As a recipient of federal funding, the Illinois EPA is required to comply with 40 CFR Part 7 (Nondiscrimination in Programs or Activities Receiving Federal Assistance from the Environmental Protection Agency). Partially to ensure compliance with 40 CFR Part 7, Illinois EPA administers it Environmental Justice Program via the Agency's Environmental Justice Policy and Environmental Justice Public Participation Policy. Within the Public Participation Policy, Illinois EPA defines "area of EJ concern" as a census block group or areas within one mile of a census block group with income below poverty and/or minority population greater than twice the statewide average.

In order to determine areas that meet the criteria of an area of EJ concern, the Illinois EPA has developed a Geographic Information System (GIS) mapping tool call EJ Start to identify census block groups and areas within one mile of census block groups meeting the EJ demographic screening criteria. EJ Start is publicly available and can be found on the Illinois EPA's EJ webpage (http://www.epa.illinois.gov/topics/environmental-justice/index). IEPA uses the same US Census/American Community Survey 5-year Estimates tables as those USEPA utilizes in its EJ Screen tool. The tables are joined to the US Census 2010 block groups.

Each block group is given "EJ Minority", "EJ Low-Income" or "EJ Both" scores. The scores are determined by dividing the population from each minority population & low-Income population by the total population of each block group and then comparing these values to the statewide average for each EJ category. If the EJ scores are twice the Illinois average for either

minority, low-income or both, the block group is assigned an EJ score of 1 for minority, 2 for low-income and 3 if it is both minority and low- income.

The main difference between USEPA EJ Screen and Illinois EPA EJ Start is that the USEPA uses a wide variety of information to "paint a picture" of the area around a facility in the form of percentiles to the NATIONAL averages (Illinois EPA uses statewide averages). However, USEPA EJ Start does not indicate whether a given area is considered an EJ community. Rather it is up to the user to generate reports in order to make the case that the area should be considered overburdened, in other words meeting the criteria of an EJ community.

Prioritization of Coal Ash Impoundments in Areas of Environmental Justice Concern

The proposed prioritization scheme assists owners and operators in determining where and how to spend their resources by categorizing impoundments based on risk to health and the environment and the impoundment's proximity to areas of environmental justice concern, requiring those with the highest risk and those located in areas of environmental justice concern to submit a closure application first, approximately nine months after the proposed rules will become effective.

Prioritization coal ash impoundments located in areas of environmental justice concern is appropriate given the potential impact of coal ash impoundments on overburdened communities. USEPA defines "overburdened communities" as "minority, low-income, tribal, or indigenous populations or geographic locations in the United States that potentially experience disproportionate environmental harms and risks. This disproportionality can be as a result of greater vulnerability to environmental hazards, lack of opportunity for public participation, or other factors. Increased vulnerability may be attributable to an accumulation of negative or lack of positive environmental, health, economic, or social conditions within these populations or

places. The term describes situations where multiple factors, including both environmental and socio-economic stressors, may act cumulatively to affect health and the environment and contribute to persistent environmental health disparities."

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PRE-FILED TESTIMONY OF ROBERT L. MATHIS

I am Robert L. Mathis, Jr., an Accountant Advanced in the Financial Assurance Program (FAP), Waste Reduction Compliance Section (WRCS) in the Bureau of Land (BOL) at the Illinois Environmental Protection Agency (Agency). I have been with the Agency 31 years serving in the FAP over 16 years. I have been auditing financial assurance mechanisms for the hazardous waste, solid waste, used tire, underground injection control, and permitted compost programs. I have developed the Standard Operating Procedures for the FAP. I have also been an integral part of the process to streamline financial assurance auditing processes. I serve as the lead accounting staff member in the FAP, which entails training lower level staff in financial assurance mechanism auditing, review and regulatory interpretation. I provide regulatory and procedural clarification to the regulated community. I also serve as the financial assurance technical advisor to BOL and Agency senior management, recommending regulatory and policy direction. I provide technical assistance to other Agency Bureaus and the Office of the Illinois Attorney General for financial assurance matters.

My testimony will address the financial assurance portions of the Agency's proposal, specifically Subpart I. I will provide a synopsis of the financial assurance component contained in the proposal and how it will effectively function.

35 Ill. Adm. Code 845.900 lists the General Provisions of the proposed rules regarding financial assurance. The owner or operator of a CCR surface impoundment must provide financial assurance for closure, post-closure and remediation (corrective action) of releases. Subpart I does not apply to the State of Illinois, local government, or any not-for-profit electric cooperative.

The Agency may sue in any court of competent jurisdiction to enforce its rights regarding financial assurance. This is a critical component of the proposed rules because it gives the Agency authority to protect taxpayer and Agency resources. The Agency can approve or disapprove the use of any financial assurance mechanism. This maintains programmatic consistency with other financial assurance regulations.

35 Ill. Adm Code 845.910 addresses Upgrading Financial Assurance. The owner or operator of a CCR surface impoundment has 60 days to increase financial assurance to an amount in excess of or equal to the current cost estimate when the cost estimate increases or the trust value decreases. Also, an owner or operator must annually adjust the cost estimate for inflation. This ensures there are enough monies in the financial assurance mechanism to cover closure, post-closure and remediation costs since these most likely increase through the passage of time.

35 Ill. Adm Code 845.920 provides when the Release of Financial Assurance is permissible. A release of financial assurance is the return to the bonding company or bank for termination. If the owner or operator substitutes alternative financial assurance, then the Agency must release any existing financial assurance being replaced. If the Agency releases the owner or operator from the requirements of Subpart I, then the Agency must release the financial assurance held.

35 Ill. Adm. Code 845.930 provides the requirements for Cost Estimates. The owner or operator shall prepare cost estimates for closure and post-closure care and for corrective action. Agency technical staff will review proposed cost estimates ensuring the estimate meets the criteria for closure, post-closure care and corrective action as set forth in the permit and regulations. Cost estimates must be based on third party costs utilizing prevailing wages. This is another critical component protecting taxpayer monies by ensuring anticipated labor costs are consistent with wages required by State law. The Agency must pay prevailing wages to any contractors based upon 820 ILCS 130. Also, the third party cannot be a parent or subsidiary of the owner or operator.

Cost estimates must be adjusted by the owner or operator annually within 60 days prior to the anniversary date. The annual adjustment must be made using the inflation factor derived from the Implicit Price Deflator for Gross National Product. This requirement maintains consistency with other FAP regulations by providing a proven method of cost estimate revision.

35 Ill. Adm. Code 845.950 outlines the allowed Mechanisms for Financial Assurance. The owner or operator can use the following financial assurance mechanisms: trust fund, surety bond guaranteeing payment, surety bond guaranteeing performance, and irrevocable letter of credit. The surety bond guaranteeing payment, trust fund, and letter of credit can be combined to equal the aggregate amount of the cost estimate(s).

If the trust fund mechanism is utilized, it must be fully funded (the value of the trust equals the cost estimate) when established. No pay-in period is permitted because it would create a lapse of financial assurance coverage. This mechanism is relatively easy for the Agency to use in the event of an owner or operator default. The Agency can direct, in writing, payments

out of the trust fund directly to the contractor completing the closure, post-closure care, or remediation work.

The surety bond guaranteeing payment can be drawn upon after an owner or operator fails to perform closure, post-closure care, or corrective action as required. The surety must be listed on the U. S. Department of Treasury's Circular 570. The monies drawn from the surety bond guaranteeing payment will be placed into the Coal Combustion Residual Surface Impoundment Financial Assurance Fund within the State Treasury.

The surety bond guaranteeing performance allows—after an owner or operator fails to perform closure, post-closure care, or corrective action as required—the surety the option of either stepping in for the owner or operator to perform the closure, post-closure care, or corrective action or paying the penal sum. If paying the penal sum is chosen, then the monies drawn from the surety bond guaranteeing performance will be placed into the Coal Combustion Residual Surface Impoundment Financial Assurance Fund within the State Treasury. The surety must be listed on the U. S. Department of Treasury's Circular 570.

The letter of credit can be drawn upon after an owner or operator fails to perform closure, post-closure care, or corrective action as required. The monies drawn from the letter of credit will be placed into the Coal Combustion Residual Surface Impoundment Financial Assurance Fund within the State Treasury.

The financial assurance portion of the proposal was constructed using selected components from other FAP regulations. These are tried and proven financial assurance regulations that not only assist the regulated community but also protect the Agency and taxpayer resources.

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PRE-FILED TESTIMONY OF DARIN E. LECRONE, P.E.

My name is Darin E. LeCrone. I have a Bachelor of Science degree in Mechanical Engineering from Southern Illinois University Carbondale, and I am an Illinois Licensed Professional Engineer. My job title is Public Service Administrator, and I serve as the Manager of the Industrial Unit in the Division of Water Pollution Control, Permit Section, at the Illinois Environmental Protection Agency. I have worked at the IEPA since May of 1992. The Industrial Unit is responsible for the wastewater permitting of many different types of industrial and commercial activities including, industrial or manufacturing facilities, coal and non-coal mines, concentrated animal feeding operations, agricultural chemical facilities, and dredge and fill related permitting and certifications. My pre-filed testimony focuses on Subpart B of the Part 845 proposal.

35 Illinois Administrative Code 845 Subpart B: Permitting

Public Act 101-171, more commonly referred to as Senate Bill 9 amended the Illinois Environmental Protection Act (Act), to regulate the construction, operation, modification and closure of Coal Combustion Residual (CCR) Surface Impoundments. It requires that the Board adopt rules establishing construction permit requirements, operating permit requirements, design standards, reporting, financial assurance, and closure and post closure care requirements for CCR surface impoundments. The legislation required that the Agency file proposed rules with the

Illinois Pollution Control Board no later than March 30, 2020, and that the Board must adopt rules no later than one year after the filing of proposed rules.

The legislation states in part that no person shall construct, install, modify, operate, or close any CCR surface impoundment without a permit granted by the Agency, or so as to violate any conditions imposed by such a permit. In accordance with the Act, any rules adopted by the Board must at a minimum: be at least as protective and comprehensive as 40 CFR Part 257 (which established a set of Federal regulations to be implemented by owners or operators of CCR surface impoundments nationwide), specify the minimum contents of construction and operating permit applications, specify which types of permits are required for certain activities, specify when permit applications must be submitted, specify standards for review and approval by the Agency, and specify meaningful public participation procedures for the issuance of construction and operating permits for CCR surface impoundments.

Many of the proposed components of either a construction permit application or an operating permit application, were certifications, demonstrations, or reports required by 40 CFR 257. That Federal regulation is a self-implementing rule, with many of the activities requiring certification by a Professional Engineer following completion. Like many other parts of this proposed regulation, the challenge was to adapt a program intended to be self-implementing, into a permit program with Agency oversight.

Subpart B of this proposed rule was written in such a way as to meet the letter and intent of the amendments to the Act. They are at least as protective and comprehensive as 40 CFR Part 257 and address the impoundment construction and operational activities covered by the amendments to the Act. The concepts of construction permits and operating permits for a facility such as a CCR surface impoundment, are similar to existing construction and operating permit

requirements as found a 35 Ill. Adm. Code Part 309 Subpart B. These regulations apply to the construction of wastewater treatment facilities and wastewater sources for all manner of wastestreams. The proposed Part 845 are written to specifically apply to CCR impoundments and be much more comprehensive in applying specific regulatory approaches to all facets of impoundment construction, operation, corrective action, closure, and post-closure care.

The draft permit, public notice and participation procedures, and final issuance processes were modeled after the National Pollutant Discharge Elimination System (NPDES). Existing Board regulations governing NPDES permit requirements can be found at 35 Ill. Adm. Code Part 309 Subpart A. Once significant difference from the NPDES process, is the Pre-Application Public Notification and Public Meeting requirements of this proposal. This allows an additional public participation step prior to a facility filing a construction permit application with the Agency. It allows public participation in the evaluation and selection of alternatives, and a discussion of the design proposal.

Another difference is the requirement for a Construction Quality Assurance Program. This requirement is intended to have a method of quality control and oversight during the construction process, to ensure that facilities being constructed are being properly constructed as designed and using proper construction methods and documentation. This will help to ensure the long-term effectiveness of liner or cover construction, or construction related to corrective action or closure.

Section 845.200 Permit Requirements and Standards of Issuance

This proposed section defines the activities related to Coal Combustion Residuals (CCR), which require a permit pursuant to this section. It establishes that permits are required for the construction, installation, modification or operation of CCR surface impoundments. It also

establishes the permit requirements related to the closure of a CCR surface impoundment or the performance of corrective action on a CCR surface impoundment. This proposed section also defines and establishes the standards for issuance of a permit required pursuant to Part 845.

Section 845.210 General Provisions

This proposed section sets forth the permitting provisions which are applicable to any permit required by this Part. This includes the requirement to submit permit application forms, signature requirements, and other information which is required as part of an application for a permit for construction, operation, corrective action, or closure. This proposed section also requires that a final Agency permitting decision be mailed to the permittee by certified mail.

Section 845.220 Construction Permits

This proposed section includes all permit requirements specific to a construction permit required by this part. It requires that construction permit applications include specific information necessary to determine if the proposed construction will comply with the requirements of this Part.

It should be noted that Public Act 101-171 allows that those facilities that have submitted a closure plan to the Agency before May 1, 2019, and have completed closure activities by July 30, 2021, are not required to obtain a construction permit for closure.

Subsection (a) includes requirements applicable to all types of construction permits. This type of information is typically submitted as part of permit applications for existing permitting programs administered by the Agency's BOW. This information includes, design and construction plans, a narrative description of the facility and its operations, a site location map, a site plan map, a narrative description of the proposed construction of or modification of the CCR surface impoundment, plans and specifications fully describing the design, nature, function and

interrelationship of each individual component of the facility, a new groundwater monitoring program or any modification to an existing groundwater monitoring program, the signature and seal of a qualified professional engineer, and the certification that the owner or operator of the CCR surface impoundment completed the public notification and public meetings required pursuant to Section 845.240, a summary of the issues raised by the public, and a list of interested persons in attendance who would like to be added to the Agency's listserv for the facility.

In addition to Subsection (a), Subsection (b) applies to all construction permit applications to build a new CCR surface impoundment, construct a lateral expansion of a CCR surface impoundment, or retrofit an existing CCR surface impoundment. Plans and specifications that demonstrate that the proposed construction will meet a set of location restriction criteria. Also proposed is the requirement for plans demonstrating that the construction of a new impoundment will meet specified liner design criteria, include leachate collection, and slope protection. This section also proposes that the application include a fugitive dust control plan, and a preliminary closure and post closure plan for the impoundment. Again, in addition to Subsection (a), Subsection (c) applies to all construction related to corrective action. Any corrective action performed pursuant to Subpart F must also contain a corrective action plan, groundwater modeling, a corrective action groundwater modeling program, and any interim measures necessary to reduce the contaminants leaching from the CCR surface impoundment, and/or potential exposures to human or ecological receptors. The groundwater modeling must show how the corrective action will achieve compliance with the applicable groundwater standards.

Subsection (d) applies in addition to Subsection (a), to construction related to the closure of a CCR surface impoundment. All construction permit applications for closure of a CCR

surface impoundment pursuant to Subpart G must contain the impoundment's closure priority category, final closure plan including the closure alternatives analysis, groundwater modeling which shows how the chosen closure alternative will result in compliance with applicable groundwater quality standards, a proposed schedule to complete closure, and a post-closure care plan if applicable.

Subsection (e) allows for the issuance of a single construction permit, for all activities if part of a single multi-phase project. Subsection (f) states that the duration of a construction permit for activities which are not related to the closure or retrofit of a CCR surface impoundment, may not exceed 3 years. The duration of a permit for closure or retrofit construction shall not exceed 5 years.

Section 845.230 Operating Permits

Operating permits are required for each CCR surface impoundment even if a construction permit is not necessary for a particular impoundment. The requirements for an operating permit are broken down in to four categories. Initial operating permit for new CCR impoundments or lateral expansions, renewal operating permits, post-closure care operating permits, and initial operating permits for existing, inactive, or inactive closed facilities. Operating permits would be issued for a fixed term not to exceed five years.

A summary of the operating permit application requirements are as follows: Application for an initial operating permit for a new CCR surface impoundments and any lateral expansion of a CCR surface impoundment must include eight separate certifications, and eight other plans or demonstrations. These certifications and demonstrations include demonstration that the facility meets the location standards, has proper slope protection, groundwater monitoring, hazard potential classification, safety factor assessment, emergency action plan, an

analysis of chemical characteristics of the CCR, and similar other requirements. This information is necessary to ensure that the requirements of the Act are being met, and that the impoundment is being properly operated and maintained to protect public health and safety, and the environment.

Application for a renewal operating permit must include information necessary to document and demonstrate ongoing operations, a summary of any changes made, and that continued operations will be in compliance with Board regulations and the Act.
Requirement that facilities in post closure care must maintain an operating permit until the completion of post closure care. An application for such a permit must note any changes to the post closure care plan, or groundwater monitoring program. Existing, inactive and inactive closed CCR surface impoundments must submit an application for an initial operating permit. Those facilities which have not completed post closure care, must submit an application for an initial operating permit to the Agency by September 30, 2021.

Specific application requirements are listed for facilities which have not completed an Agency approved closure prior to July 30, 2021, facilities which have completed an Agency approved closure prior to July 30, 2021, and for inactive closed CCR surface impoundments

Section 845.240 Pre-Application Public Notification and Public Meeting

This section was included to comply with the requirement to provide for meaningful public participation procedures for the issuance of construction and operating permits for CCR surface impoundments, and to be at least as protective and comprehensive as 40 CFR 257. This section requires that the owner or operator of a CCR surface impoundment hold at least two public meetings, to discuss the any proposed construction related to a CCR surface impoundment. The language includes specific requirement on the process for public noticing such meetings,

timeframes, and non-english language service requirements. The purpose of these meetings is to give the public, especially those living near the facilities, meaningful input on the consideration of alternatives related to construction, corrective action and closure.

Section 845.250 Tentative Determination and Draft Permit

Sections 845.250-.280 are modeled after the Agency's current NPDES notice and decision-making process. The first part of this process requires that the Agency notify an applicant of its tentative determination to either issue or deny a permit. This notice must be in writing and include the Agency's tentative decision and the basis for that decision. This notice of tentative decision is commonly referred to as the "15-day notice" portion of the NPDES permitting process. It provides the applicant the opportunity to see in writing the Agency's tentative decision, including a draft of the proposed permit, and any conditions contained therein. If the tentative decision of the Agency is to deny the permit, the notice must include a statement of the reasons for denial.

Section 845.260 Draft Permit Public Notice and Participation

This section was modeled after the public notice and opportunity for hearing process for the NPDES program. As proposed, it meets the requirements of the amendments to the Act for meaningful public participation in the issuance of permits. As with the NPDES program, this section allows for a 30-day public notice process and comment period and allows for commenters to request a public hearing on the draft permit. The section specifies what information must be contained in such a public notice, how the public notice is to be distributed and posted on the Agency's website and social media outlets.

Comments and/or requests for a public hearing must be submitted to the Agency in

writing, and must be received during the 30-day public notice period. If a public hearing is granted by the Agency, public notice of such a hearing must be given for 30 days as well.

Following a hearing, the Agency must prepare a responsiveness summary which includes a summary of all comments received and the Agency's response to all significant comments, criticisms and suggestions, along with the Agency's final permitting decisions.

Section 845.270 Final Permit Determination and Appeal

This section outlines when and how the Agency shall make a final permitting decision and allows for the appeal of the Agency's to the Illinois Pollution Control Board.

Section 845.280 Transfer, Modification and Renewal

This section outlines the conditions under which a permit may be transferred from one permittee to another, when and how a permit may be modified, and when and how a permit may be renewed. Agency initiated modifications may occur to correct a typographical error of calculation error, discovery that a determination or condition was based upon false or misleading information, due to an order of the Board, or due to the promulgation of new statutes or regulations affecting the permit. The owner or operator of a CCR surface impoundment may also seek modification of a permit by submitted and application at any time after a permit is approved, and before it expires.

Minor modifications are defined, which may be undertaken without public notice. These minor modifications may only be used to correct typographical errors, require more frequent monitoring or reporting including additional groundwater monitoring, allow for a change in ownership, change a construction schedule which does not impact the final completion date, or to require electronic reporting requirements.

Consistent with existing NPDES requirements, renewal application shall be filed at least 180 days prior to the expiration date of the existing permit, unless a waiver of that 180-day deadline has been requested by the permittee and granted by the Agency.

Section 845.290 Construction Quality Assurance Program

Applicants for a construction permit, are required to develop and implement a Construction Quality Assurance Program. This requirement is intended to have a method of quality control and oversight during the construction process, to ensure that facilities being constructed are being properly constructed as designed and using proper construction methods and documentation. This section is not currently part of existing Part 309 wastewater permitting programs.

40 CFR Part 257 requires the certification by a Professional Engineer of various tasks and assessments. This is meant to document certification of the completion of certain items that are required by the federal regulations. Following that same logic, the Agency determined that a Construction Quality Assurance Program was necessary to ensure that facilities are construction according to their design and that industry best practices are used during the construction and that personnel are assigned to supervise these activities and document their completion. This will help to ensure the long-term effectiveness of liner or cover construction, or construction related to corrective action or closure.

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PRE-FILED TESTIMONY MELINDA SHAW

My name is Melinda Shaw and I graduated from Western Illinois University with a Bachelor of Science in Geology with a focus in Environmental Studies. Cumulatively, I have worked for the Illinois EPA for six years in various remediation programs. I now work in the Groundwater Section, Hydrogeology and Compliance Unit (HCU) of the Bureau of Water (BOW). The HCU provides technical expertise to the BOW Permit Section on groundwater issues. I have enclosed a copy of my Curriculum Vitae as Attachment I.

In my testimony I will discuss aspects of the proposed Part 845 - Subpart C Location Restrictions, general information on manifests in Part 845 - Subpart G Closure and Post-Closure Care, and Part 845-Subpart H Recordkeeping.

SUBPART C: LOCATION RESTRICTIONS

Proposed Part 845 was written to comply with the requirements of 40 CFR 257, which includes location restrictions for placement of CCR surface impoundments. Proposed Subpart C provides the location restrictions for existing, new, and laterally expanded CCR surface impoundments. The owner or operator of the CCR surface impoundment must obtain a certification from a qualified professional engineer indicating if the location demonstrations have been met at each respective location. The location restrictions demonstration must go into the permit application. For existing surface impoundments, this is the initial operating permit

application. For new and lateral expansions, this is a construction permit application. This information will be kept in the facility's operating record and will be available on the facility's website for public access.

The restricted locations are: placement above the uppermost aquifer, wetlands, fault areas, seismic impact zones, and unstable areas. If any existing surface impoundment fails to meet these location standards, the owner or operator is subject to the requirements of Section 845.700. If any new or laterally expanded surface impoundment fails to meet these location restrictions, the owner or operator will be prohibited from placing CCR into the surface impoundment.

Uppermost Aquifer

The purpose of Section 845.300 is to protect groundwater from coming into contact with CCR in a surface impoundment. This Section is consistent with 40 CFR 257.60.

Any existing, new, or laterally expanded CCR surface impoundment must be constructed with a base that is located no less than five feet above the uppermost aquifer. The uppermost aquifer is defined as the geologic formation nearest the natural ground surface that is an aquifer, as well as lower aquifers that are hydraulically interconnected with this aquifer within the facility's property boundary. An aquifer means a geologic formation, group of formations, or portion of a formation capable of yielding usable quantities of groundwater to wells or springs. The upper limit of the aquifer is measured at a point nearest to the natural ground surface to which the aquifer rises during the wet season.

To be ruled out of being considered the uppermost aquifer, there must not be an intermittent, recurring or sustained hydraulic connection between any portion of the base of the

CCR surface impoundment and groundwater in an aquifer. This includes normal fluctuations of groundwater, to include the seasonally high-water table.

Wetlands

The purpose of Section 845.310 is to keep CCR surface impoundments out of wetlands. This Section is consistent with 40 CFR 257.61.

Wetlands are defined as those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas.

There are a number of federal laws pertaining to wetlands, which are listed in this Section. Illinois has added the Interagency Wetlands Policy Act of 1989, the Rivers, Lakes, and Streams Act, and the Illinois Endangered Species Protection Act to the regulatory requirements required by the federal rule. The remainder of requirements are taken directly from 40 CFR 257.61 regulations.

Existing and new CCR surface impoundments, and all lateral expansions of CCR surface impoundments must not be located in wetlands unless the owner or operator demonstrates certain criteria. This criteria includes, where applicable, under Section 404 of the Clean Water Act, Interagency Wetlands Policy Act of 1989 (20 ILCS 830 et seq.) and Rivers, Lakes, and Streams Act (615 ILCS 5/4.9 et seq.), or other applicable state wetlands laws, a clear and objective rebuttal of the presumption that an alternative to the CCR surface impoundment is reasonably available that does not involve wetlands. Factors in the rebuttable presumption include the construction and operation of the CCR surface impoundment will not cause or contribute to any violation of any applicable state or federal water quality standard; violation of any applicable

toxic effluent standard or prohibition under Section 307 of the Clean Water Act; jeopardize the continued existence of endangered or threatened species or result in the destruction or adverse modification of a critical habitat, protected under the Endangered Species Act of 1973 (16 U.S.C. 1531 et seq.) and the Illinois Endangered Species Protection Act (520 ILCS 10/1 et seq.); and violation of any requirement under the Marine Protection, Research, and Sanctuaries Act of 1972 (16 U.S.C. 1431 and 33 U.S.C. 1401) for the protection of a marine sanctuary.

Additionally, a demonstration must be made that no degradation of wetlands will occur. This is based on several factors including, erosion, stability, and migration of native wetland soils. The demonstration must include information on dredged and fill materials as well. The chemical nature and volume of CCR must be included. This Section attempts to achieve no net loss of wetlands by avoiding impacts and minimizing impacts.

Fault Areas

The purpose of Section 845.320 is to ensure that the structural stability of a CCR surface impoundment will not be compromised due to a fault area. This Section is consistent with 40 CFR 257.62.

New, existing, or laterally expanded CCR surface impoundments must not be located within 200 feet of the outermost damage zone of a fault with displacement during the Holocene. An exception is if the owner or operator can show that no structural damage to a CCR surface impoundment will result with a distance less than 200 feet. The outermost damage zone is the volume of deformed wall rocks around a fault surface that results from the initiation, propagation, interaction and build-up of slip along faults. In other words, the outermost damage zone is the geologic material that was deformed near a fault.

The Holocene refers to a specific amount of time in the geologic record. The Holocene is a geologic epoch, which is a portion of a geologic period. The Holocene makes up the latter part of the Quaternary Period and includes the present to about 11,700 years ago. The CCR surface impoundment cannot be located within 200 feet of a recently active fault that has shown displacement during the last 11,700 years, unless it can be demonstrated that no structural damage to the surface impoundment will occur.

Seismic Impact Zone

The purpose of Section 845.330 is to ensure that the structural stability of a CCR surface impoundment will not be compromised due to seismic activity. This Section is consistent with 40 CFR 257.63.

The seismic impact zone is defined as an area having a 2% or greater probability that the maximum expected horizontal acceleration, expressed as a percentage of the earth's gravitational pull (g), will exceed 0.10 g in 50 years. In other words, it is the area that has a 2% chance in 50 years to have a seismic activity (e.g. earthquake) strong enough to exceed .10 of the earth's gravitational pull, expressed as (g) in the definition.

The maximum horizontal acceleration in lithified earth material is defined as the maximum expected horizontal acceleration at the ground surface as depicted on a seismic hazard map, with a 98% or greater probability that the acceleration will not be exceeded in 50 years, or the maximum expected horizontal acceleration based on a site-specific seismic risk assessment. This means that the owner or operator will be 98% sure that maximum ground surface acceleration (in the horizontal directions) will not occur in 50 years. Or, the owner or operator will conduct a site-specific seismic risk assessment to determine the maximum horizontal acceleration. The maximum horizontal acceleration may not exceed 0.10 g, without engineering

controls as discussed above. If the CCR surface impoundment is in a seismic impact zone, then the structure must be designed and engineered to withstand the calculated maximum horizontal acceleration.

Unstable Areas

The purpose of Section 845.340 is to ensure that the structural stability of a CCR surface impoundment will not be compromised due to an unstable area. This Section is consistent with 40 CFR 257.64.

An unstable area is defined as a location that is susceptible to natural or human-induced events or forces capable of impairing the integrity, including structural components of some or all of the CCR surface impoundment that are responsible for preventing releases from such a surface impoundment. Unstable areas can include poor foundation conditions, areas susceptible to mass movements, and karst terrains. As with fault areas and seismic impact zones, if the CCR surface impoundment is in an unstable area, then the structure must be designed and engineered to ensure the integrity of structural components.

Failure to Meet Location Standards

The purpose of Section 845.350 is to ensure that the owner or operator will comply with the location restrictions. This Section was created to satisfy portions of 40 CFR 257.60 through 257.64.

If an existing CCR surface impoundment does not comply with the locations restrictions of this Subpart, they are subject to the requirements of Section 845.700 which require the owner or operator to close or retrofit the impoundment. If a new or laterally expanded CCR surface impoundment fails to meet the location restrictions, placement of CCR in the impoundment will be prohibited.

SUBPART G: CLOSURE AND POST-CLOSURE CARE
Section 845.740(c)(1)(A)

Manifests

Manifesting requirements are included in Section 845.740(c)(1)(A), under the transportation portion of Subpart G. Manifesting must be carried out as specified in 35 IAC 809 during transportation off-site by motor vehicle of CCR during removal. Fly ash is specifically mentioned in this subsection to include a manifest during transportation described above. For transportation by other means, such as barge or train, manifests will also be required to include the following information: the volume of the CCR; the location from which the CCR was loaded onto the mode of transportation and the date the loading took place; and the location where the CCR is being taken and the date it will be delivered. This is to ensure the responsible transportation of CCR, including fly ash.

SUBPART H: RECORDKEEPING

Facility Operating Record

Section 845.800 describes the information that must be included in the facility operating record. It was written to include all of the requirements of 40 CFR 257.105.

Unless specifically stated otherwise, all files required by this Section must remain in the operating record for at least three years after the Agency approves the request to terminate post-closure care (when closed in place), or when the groundwater monitoring is complete if closure is by removal. This section provides the mechanisms in which the facility operating record must be stored.

Publicly Accessible Internet Site Requirements

Section 845.810 describes the information that must be included on the facility website. It was written to include all of the requirements of 40 CFR 257.107.

Unless specifically stated otherwise, all files required by this Section must remain on the CCR website for at least three years after the Agency approves the request to terminate post-closure care (when closed in place), or when the groundwater monitoring is complete if closure is by removal. This Section requires the owner or operator to notify the Agency in case of any internet web address change.

ATTACHMENT 1

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Applicable Experience

Illinois Environmental Protection Agency
Springfield, Illinois

Environmental Protection Geologist August 2004 to January 2009 & June 2018 to Present

Bureau of Water, Groundwater Section November 2019 to Present

Participates in source water assessment and protection and groundwater remediation and cleanup efforts. Assists higher level geologists with review and evaluation of hydrogeologic depositional environments to characterize contaminant migration in the subsurface. Receives training and guidance and performs duties relative to geologic investigation and administration of the Illinois Environmental Protection, Groundwater Protection, Federal Safe Drinking Water, Clean Water, and Resource Conservation and Recovery (RCRA) Acts and the 35 Illinois Administrative Code Part 620 regulations. Assists with providing geologic and groundwater information for the Office of Emergency Response reports as they come into the Agency.

Bureau of Land, Federal Site Remediation Section June 2018 to November 2019

Performed technical research, reviews, and assistance that apply to the Illinois Environmental Protection Act, the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), also known as Superfund, and the 35 Illinois Administrative Code for project management of 10 CERCLA and/or Department of Defense (DoD) Sites in the state. Each of these sites have multiple areas of contamination in various media (soil, sediment, surface and groundwater). Provided geologic knowledge and assistance to other members of the Federal Site Remediation Section, which is made up of engineers, geologists and specialists. Made recommendations on behalf of the state and prepared briefing materials for the Director of the Illinois EPA.

Bureau of Land, Permit Section **August 2004 to January 2009**

Responsible for fluency of historical information, both geologic and operational for 15 hazardous waste facilities and the Carbon dioxide sequestration site in Illinois for the RCRA Groundwater Assistance Unit. Evaluated hydrogeologic information including geologic descriptions, interpreting potentiometric maps, studying boring logs and cross sections, and correlating geologic information. Made recommendations in memoranda format based on hydrogeologic evaluations.

Western Illinois University
Macomb, Illinois

Summer Geology Intern **May 2002 to July 2002**

Collected sediments from small streams in western Illinois. Prepared samples for submission to the Illinois State Geological Survey for analysis.

Geology Department Assistant/Tutor **May 2001 to May 2003**

Assisted students in the Introduction to the Earth Laboratory. Assisted faculty members in research including data collection and analysis.

Education

Western Illinois University **May 2003**
Macomb, Illinois
Bachelor of Science: Geology

Contaminant Transport **2006**
Short course by Illinois State University

Introduction to the ACES Database **2006**
Short course by Illinois EPA

Introduction to Aquifer Testing **2006**
Short course by Illinois State University

General Statistics **2006**
Short course by Illinois State University

Topics in Statistical Sampling Procedures **2006**
Short course by Illinois State University

Introduction to Arcview and GIS **2006**
Short course by Illinois EPA

Introduction to Rock Works **2006**
Short course by Illinois State University

Field Geology of Illinois for Environmental Professionals **2006**
Short course by Illinois State University of Spoon River/ Lewistown Area

Environmental Fate and Contaminant Transport Modeling **2006**
Short course by Illinois State University

Topics in Groundwater Modeling **2006**
Short course by Illinois State University

Field Geology of Illinois for Environmental Professionals **2007**
Short course by Illinois State University of Carbondale Area

Introduction to Risk Assessment, Guidance for Superfund **July 10 – 12, 2018**
Introductory course by US EPA

HAZWOPER 40 Hour **July 16 – 20, 2018**
Hazardous material handling by University of Illinois

Superfund 101 **October 29 – November 2, 2018**
Introductory course by US EPA

Defense Environmental Restoration Program Training **May 7 – 10, 2019**
Series of short courses by Department of Defense

Per- and Polyfluoroalkyl Substances (PFAS) Training **May 10, 2019**
Interstate Technology and Regulatory Council (ITRC)

Air Force Summit **July 24 – 25, 2019**
Series of short courses by Department of Defense