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MISSOURI PUBLIC SERVICE COMMISSION

Case No. EA-2012-0281

SURREBUTTAL TESTIMONY

OF

GARY KING

ON

BEHALF OF

UNION ELECTRIC COMPANY
d/b/a AMEREN MISSOURI

Springfield, IL
September, 2013

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SURREBUTTAL TESTIMONY OF GARY KING

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I. INTRODUCTION

Q. PLEASE STATE YOUR NAME AND EMPLOYMENT POSITION.

A. My name is Gary King. I am employed by the environmental consulting firm ARCADIS U.S., Inc. I have been employed with ARCADIS since February 2012. Prior to joining ARCADIS I was employed by the Illinois Environmental Protection Agency (Illinois EPA) as the Manager of the Division of Remediation Management for the Bureau of Land. From 1990 through 2011, I was the senior manager for the Illinois EPA site cleanup programs: the voluntary cleanup program (also known as the Site Remediation Program), State and Federal Superfund cleanup programs, the Department of Defense cleanup program, and the Leaking Underground Storage Tank cleanup program. I led the development of multiple regulatory programs concerning the cleanup and closure of sites.

Prior to 1990 I managed the Illinois EPA land enforcement programs.

I am an attorney licensed to practice law in Illinois. I received a J.D degree from Valparaiso University and a B.S. degree in Civil Engineering, also from Valparaiso University. My CV is attached hereto and incorporated herein by this reference as Exhibit A.

Q. HAVE YOU PREVIOUSLY FILED TESTIMONY IN THIS PROCEEDING?

A. No.

Q. WHAT IS THE PURPOSE OF YOUR SURREBUTTAL TESTIMONY IN THIS PROCEEDING?

A. My purpose in testifying in this proceeding is to provide accurate information to the Missouri Public Service Commission with regards to testimony given during Local Public Hearings held on June 25, 2013, and July 10, 2013, concerning activities of affiliates of Ameren Missouri (primarily Ameren Energy Resources or "AER") in Illinois regarding coal ash impoundments operated by those affiliates, and regarding Ameren Missouri's Venice Plant and its coal ash impoundments. More specifically, I address local public hearing witness testimony relating to these Illinois coal ash impoundments, including the suggestion that AER's and Ameren Missouri's operation of coal ash impoundments has been inappropriate, with the resulting implication that this renders Ameren Missouri unqualified to operate a coal combustion products landfill in Missouri. I will explain why the allegations about AER's and Ameren Missouri's coal ash operations in Illinois are inaccurate, and will do so based on my direct knowledge of the facts relating to the issues raised, my approximately 35 years of involvement in environmental regulation in Illinois, and my direct involvement with the Illinois EPA on AER's behalf in developing rules applicable to coal ash impoundments.

Q. DID YOU REVIEW ANY TESTIMONY (FILED OR OTHERWISE) TAKEN IN THIS CASE IN COMPLETING YOUR WORK AND ARRIVING AT YOUR OPINIONS?

A. Yes.

Q. WHAT TESTIMONY DID YOU REVIEW?

A. I reviewed the hearing transcripts from the Local Public Hearings on June 25, 2013, and July 10, 2013.

Q. TO THE EXTENT YOU RELIED UPON ANY DOCUMENTS IN FORMING YOUR OPINIONS ARE THOSE DOCUMENTS OF THE TYPE REASONABLY RELIED UPON BY EXPERTS IN YOUR AREAS OF EXPERTISE AND DO YOU CONSIDER SUCH DOCUMENTS REASONABLY RELIABLE?

A. Yes.

Q. ARE THE OPINIONS EXPRESSED IN THIS TESTIMONY GIVEN WITHIN A REASONABLE DEGREE OF CERTAINTY?

A. Yes.

II. SUMMARY OF KEY CONCLUSIONS

Q. WHAT ARE YOUR KEY CONCLUSIONS?

A. My key conclusions are as follows:

- Contrary to the claims of some of the local public hearing witnesses, Illinois currently does not have regulations in place that generally require owners and operators of coal ash impoundments to monitor groundwater around those impoundments. AER has been voluntarily monitoring groundwater at coal ash impoundments at its power generating facilities in Illinois since 2010 even though there is no regulation in place that requires it to do so.

- AER has actively participated with Illinois EPA in development of regulations that would establish criteria for groundwater monitoring, corrective action and closure at facilities. AER supports the adoption of a state-wide rule in Illinois applicable to all utility coal ash impoundments.
- The case that the Attorney General's Office filed on February 4, 2013, concerns procedural violations that occurred in 2004-2005 relating to the use of coal ash as structural fill in building a rail line at the Duck Creek plant, and is unrelated to groundwater monitoring issues at the AER coal ash ponds in Illinois. The beneficial use of coal ash in engineered applications such as base material in a rail line is authorized under the Illinois Environmental Protection Act. There is no threat to human health or the environment from this beneficial use.
- The coal ash ponds at the AER Coffeen station are not adversely impacting any drinking water supply or Coffeen Lake.
- The coal ash ponds at the AER Meredosia station are not adversely impacting any drinking water supply or the Illinois River.
- The coal ash pond at the AER Grand Tower station is not adversely impacting any drinking water supply or the Mississippi River.
- The coal ash ponds at the AER Joppa station are not adversely impacting any drinking water supply or the Ohio River.
- The coal ash ponds at the AER Newton station are not adversely impacting any drinking water supply or Newton Lake.

- The coal ash ponds at the Ameren Missouri Venice station are not adversely impacting any drinking water supply or the Mississippi River.
- AER and Ameren Missouri have taken, and continue to take, steps relative to their coal ash ponds in Illinois to assure that human health and the environment are protected.

III. RESPONSE TO TESTIMONY REGARDING ILLINOIS REGULATIONS AND ACTIVITIES OF AMEREN ENERGY RESOURCES AND AMEREN MISSOURI IN ILLINOIS FROM LOCAL PUBLIC HEARINGS ON JUNE 25, 2013, AND JULY 10, 2013

Q. WHAT TESTIMONY ARE YOU ADDRESSING?

A. In general I am addressing testimony and documents provided at the local public hearings concerning coal ash impoundments or other coal ash handling issues relating to AER's power plants in Illinois, and the implication that AER has not managed those issues properly, which, in turn, the witnesses suggest means that Ameren Missouri should not be allowed to construct a utility waste landfill in Missouri. I also address similar allegations regarding Ameren Missouri's Venice station. This testimony was presented by a number of witnesses, including Petra Haynes, Susan Cunningham, Ron Trimmer, Lloyd Klinedinst, Christine Alt, Celeste Nohl-Smith, John George and Stuart Keating.

Q. DID WITNESSES AT THE LOCAL PUBLIC HEARINGS RAISE ISSUES REGARDING ILLINOIS REGULATORY REQUIREMENTS RELATING TO ASH PONDS AND AER'S OR AMEREN MISSOURI'S ACTIVITIES RELATIVE TO THOSE REQUIREMENTS?

A. Yes, they did. For example, Ms. Celeste Nohl-Smith, Mr. John George and Ms. Christine Alt all claimed that Illinois requires groundwater monitoring around ash ponds and apparently were pointing to the current lack of such requirements in Missouri.

Q. WHAT ARE THE RELEVANT REGULATORY REQUIREMENTS IN ILLINOIS, AND WHAT HAVE BEEN AER'S ACTIVITIES RELATIVE TO THOSE REQUIREMENTS?

A. Illinois does not currently have regulations in place that generally require owners and operators of coal ash impoundments to monitor groundwater around those impoundments.[1] Following the collapse of the dikes of an ash impoundment in Kingston, Tennessee, then-Lieutenant Governor Pat Quinn requested in February 2009 an assessment of the threats posed by coal ash impoundments from Illinois EPA's Director Doug Scott. Without state regulations requiring AER (or any utility, for that matter) to monitor groundwater around coal ash impoundments, the only way any threat or risk could be evaluated was if AER voluntarily agreed to install groundwater monitoring.

AER has been voluntarily monitoring groundwater at coal ash impoundments at its power generating facilities in Illinois since 2010. After undertaking this voluntary monitoring, AER reported the results of the groundwater monitoring to Illinois EPA. As a

[1] In 2009 AER filed a proposal for site-specific rulemaking for closure of Pond D at its Hutsonville station. The proposal included groundwater monitoring requirements. The Illinois Pollution Control Board adopted a site-specific rule based on AER's proposal on January 20, 2011 (35 Ill. Adm. Code 840, Subpart A). The Illinois Pollution Control Board adopts rules and regulations determining, defining and implementing the environmental control standards applicable in the State of Illinois. Please note that unlike Missouri, rules can be adopted that apply to a particular company or site, rather than applying generally to all similarly-situated companies. In effect, a site-specific rule establishes environmental control standards for specified activities at a designated site that will protect human health and the environment.

result of its monitoring of groundwater, AER found exceedances of Illinois groundwater standards adjacent to some of the coal ash impoundments.[2]

Based on the information voluntarily supplied by AER, the Illinois EPA on June 27, 2012 (as I would have expected it to do) followed its standard compliance and enforcement procedures and issued Violation Notices ("VNs") to AER for four of its facilities (Coffeen, Grand Tower, Meredosia, and Newton). On February 13, 2013, the Illinois EPA took the next routine step in its administrative[3] process by issuing Notices of Intent to Pursue Legal Action (NITPLA) to AER for the four facilities for which VNs were previously issued. However, enforcement actions have not been filed. Rather, AER and Illinois EPA have focused their efforts on developing a regulatory structure that would allow for the orderly closure of ash impoundments depending upon site specific criteria.

Q. DOESN'T THE ISSUANCE OF VNS AND NITPLAS SUGGEST A SERIOUS THREAT TO HUMAN HEALTH AND THE ENVIRONMENT ARISING FROM A VIOLATION OF ENVIRONMENTAL LAWS OR REGULATIONS?

A. No. In circumstances of material danger to the environment or human health, the Illinois EPA will request the Illinois Attorney General to institute a civil action for an immediate injunction under Section 43(a) of the Illinois Environmental Protection Act. No such action was initiated with regards to the groundwater exceedances at any of

[2] In Illinois, numerical groundwater quality standards apply to all subsurface waters based upon the specific classification of the groundwater. Missouri defines groundwater somewhat differently in that the definition of "waters of the state" expressly excludes subsurface waters that are located under privately owned property. *See* 10 CSR 20-2.010 (82).

[3] Mr. Lloyd Klinedinst also discussed these VN's as part of his testimony and included them as exhibits.

these four power plants. As I noted, issuance of VNs and NITPLAs is a routine and standard part of the process involved in addressing industrial sites like coal ash impoundments at power plants. The only way that AER could have avoided the issuance of NITPLAs would have been for AER to sign a Compliance Commitment Agreement that would have required that AER immediately initiate closure of all ash ponds at the four facilities. That was not physically possible for a variety of reasons, including the need to continue to utilize the ponds to dispose of coal combustion products from power generation, the significant costs involved over such a short period of time, the lack of ability to access the services needed to complete ash pond closures in such a short period of time and, most importantly, the absence of off-site impacts that would warrant such action. Contrary to suggestions that were made at the local public hearings, the Illinois Attorney General's Office did **not** file an enforcement complaint as a result of the NITPLAs issued on February 13, 2013. Instead, the Illinois Attorney General is participating along with other stakeholders in the surface impoundment rulemaking efforts I describe below.

Q. WHAT OCCURRED IN RESPONSE TO THE ISSUANCE OF THE VNS?

A. In the absence of state or federal regulations governing the closure of ash impoundments at power generating facilities in Illinois, AER voluntarily filed a petition with the Illinois Pollution Control Board (R2013-019) on April 9, 2013, requesting the Board to promulgate site-specific rules applicable to eight AER facilities in Illinois (Grand Tower, Newton, Coffeen, Meredosia, Joppa, Hutsonville, Edwards, and Duck Creek) that

would establish enforceable deadlines, requirements and procedures to address the sixteen ash ponds at these facilities. AER's proposal contained the language of the rule to be adopted.

This approach was unprecedented in terms of a company requesting that rules be put in place, where none previously existed, mandating it to address environmental issues at all of its coal ash impoundments. The proposed rule provided a clear framework to address ash impoundments owned and operated by AER in a protective and synchronized fashion.

Q. WHAT WAS YOUR INVOLVEMENT WITH THE AER COAL ASH IMPOUNDMENTS?

A. AER hired me to help with the preparation of this site-specific rulemaking proposal because of my experience in developing rulemaking proposals when I was with Illinois EPA. As a former regulator I was, and still continue to be, very impressed with the commitment AER has shown in moving forward to resolve environmental issues at its coal ash impoundments in Illinois.

Q. HOW DID AER'S PROPOSAL DEVELOP?

A. Prior to filing the proposal for rulemaking, AER entered into productive discussions with the Illinois EPA regarding the proposed rule language. Discussions continued after AER filed its rulemaking proposal on April 9, 2013. Recognizing the general need for such rules following the filing of AER's petition, the Illinois EPA concluded that rules

should be put in place mandating corrective action or closure at coal ash ponds at all power generating facilities in Illinois, not just AER facilities.

The Illinois EPA has prepared a draft of a regulatory proposal that it is planning on filing with the Illinois Pollution Control Board in the fall of 2013. If adopted by the Board, it would become the first set of general regulations in Illinois that would require owners and operators of coal ash impoundments to monitor groundwater to determine if there have been releases to groundwater attributable to coal ash impoundments. This draft is called "Part 841: Coal Combustion Waste Surface Impoundments at Power Generating Facilities." The Illinois EPA used the draft rule from the petition that AER filed in R2013-019 as its initial model for drafting Part 841.

Illinois EPA released its draft for public review on June 12, 2013, and held a Stakeholders Meeting on June 27, 2013, that included representatives from utilities, environmental groups and the Illinois Attorney General's Office. AER supports the adoption of the Illinois EPA's proposed rule and filed comments on July 22, 2013, to clarify and increase the effectiveness of this rule. Based upon recent discussions with Illinois EPA, the Agency's draft rule is undergoing final internal review before being filed with the Illinois Pollution Control Board.

Q. WHAT IS THE STATUS OF AER'S PENDING SITE-SPECIFIC RULE CHANGE REQUEST?

A. Illinois EPA requested that AER file a motion to stay the proceeding in R2013-019 while the Agency develops and prepares Part 841 for filing with the Illinois Pollution Control

Board. AER filed a motion to stay and it was granted by the Illinois Pollution Control Board on July 25, 2013.

AER has commended the Illinois EPA on its efforts to initiate a state-wide regulatory framework for the monitoring, corrective action and closure of coal combustion waste surface impoundments and continues to work with Illinois EPA as it prepares Part 841 for filing.

Q. WHAT WILL HAPPEN NEXT?

A. The Illinois Pollution Control Board will establish a docket and commence a formal rulemaking process which will entail public participation and comments from interested stakeholders. Once the Illinois Pollution Control Board has adopted regulations setting forth the procedures and criteria for performing corrective action and closure, owners and operators of facilities containing ash impoundments, including AER, will move forward to perform corrective action and closure at the coal ash impoundments at its Illinois power generating facilities in accordance with those regulations.

Q. YOU TESTIFIED EARLIER THAT FOUR AER SITES RECEIVED VNs—COFFEEN, GRAND TOWER, NEWTON AND MEREDOSIA. ARE YOU FAMILIAR WITH THE CURRENT STATUS OF THE ENVIRONMENTAL ISSUES AT THESE PLANTS?

A. Yes.

Q. PLEASE SUMMARIZE THE ENVIRONMENTAL ISSUES RELATED TO THE COFFEEN PLANT.

A. Through a subsidiary, AER owns and operates the Coffeen Energy Center in Montgomery County in central Illinois, approximately 2 miles south of the City of Coffeen. The plant is located between the east and west channels of Coffeen Lake. The coal-fired plant currently operates two active impoundments and one recently constructed landfill for coal combustion product (CCP) management. A closed, inactive CCP impoundment is also located at the site. The landfill used for fly ash management and the active impoundment used for FGD gypsum management are lined. The active impoundment used for bottom ash management and the inactive impoundment formerly used for fly ash management are unlined. As required by landfill regulations, the landfill and lined impoundment have a groundwater monitoring program. To assess the potential for constituent migration from the unlined impoundments, AER commissioned a hydrogeological study. The hydrogeological assessment report was filed with the Illinois Pollution Control Board on April 9, 2013, as part of AER's rulemaking submission in R2013-019.

The primary conclusions from voluntary monitoring of groundwater at the Coffeen Energy Center unlined CCP impoundments are:

- The unlined impoundments are situated in an area of fine-grained soils, greater than 20 feet thick, where groundwater migration is typically restricted by low hydraulic conductivity. Furthermore, the unlined impoundments are bordered in the probable directions of groundwater flow by the plant discharge channel and Coffeen Lake. Coffeen Lake is located entirely on property owned by AER. These

observations indicate that migration in groundwater from the unlined impoundments will be limited to AER's Coffeen property.

- The closest water supply wells to the unlined impoundments are 2,000 feet to the east and on the opposite side of the east branch of Coffeen Lake. The conceptual model of groundwater flow indicates groundwater at the unlined impoundments discharges to Coffeen Lake, and there is no reasonable pathway for migration from the unlined impoundments to these upgradient wells.
- Operation of the impoundments has caused exceedances of Illinois Class I groundwater quality standards for boron, sulfate, and total dissolved solids (TDS); however, I note that neither Illinois nor USEPA has established primary drinking water standards for boron, sulfate or TDS, recognizing the lack of toxicity associated with such parameters.

Based upon the hydrogeological studies at the site, the report concluded and it is my opinion that the coal ash ponds at the AER Coffeen station are not adversely impacting any drinking water supply or Coffeen Lake and do not pose a risk to public health. The rulemaking to be filed with the Illinois Pollution Control Board by the Illinois EPA will properly address any requirements for groundwater monitoring, corrective action and closure of the coal ash ponds at the AER Coffeen site.

Q. PLEASE SUMMARIZE ENVIRONMENTAL ISSUES RELATED TO THE GRAND TOWER PLANT.

A. AER owns and operates the Grand Tower Energy Center in Jackson County, Illinois. The plant is located on the floodplain on the east side of the Mississippi River adjacent to the levee. The power station began operation in 1951 and formerly operated both coal- and oil-fired boilers, but converted to natural gas in 2001. The plant has one impoundment formerly used for coal ash management and currently used for low volume wastewater. To assess the potential for constituent migration from this impoundment, AER commissioned a hydrogeological study. The hydrogeological assessment report was filed with the Illinois Pollution Control Board on April 9, 2013, as part of AER's rulemaking submission in R2013-019.

The plant has an active NPDES permit for discharge to a tributary of the Mississippi River located to the south of the coal ash impoundment. The major surface water body in the vicinity of the plant is the Mississippi River, which flows from north to south and is located about 300 feet west of the impoundment.

Excluding a portion of the levee that is not owned by AER, the coal ash impoundment is more than 200 feet from the closest property boundary, which is to the southeast. This direction would normally be upgradient because groundwater typically flows toward major water bodies such as the Mississippi River. However, flow reversals can occur which suggests that there is potential for off-site migration if flow reversals occur over sufficiently long periods for groundwater to migrate from the impoundment toward the property boundary.

There are no active water supply wells, however, within 2,500 feet of the coal ash impoundment other than plant production wells that are not used for potable water supply. The closest water supply wells are 1.3 miles to the south, and provide the community water supply for the town of Grand Tower. The potential for migration to the Grand Tower municipal wells is much lower than the potential for off-site migration due to the relatively large (for groundwater flow) distance from the coal ash impoundment to the Grand Tower community water supply wells.

A mixing calculation was performed to conservatively estimate the impact of boron discharge to the Mississippi River on concentrations in river water. Due to the size of the Mississippi River, an additional calculation was performed to calculate the incremental boron increase assuming that mixing occurred within 50 feet of the shoreline. The result of this calculation is a very conservative estimate of the increase in boron loading to the Mississippi River. This result (0.0002 mg/L) is lower than the instrument detection limit for boron and is therefore not measurable.

Based upon the hydrogeological studies at the site, the report concluded and it is my opinion that the coal ash pond at the AER Grand Tower station is not adversely impacting any drinking water supply or the Mississippi River and, therefore, does not pose a public health risk. The rulemaking to be filed with the Illinois Pollution Control Board by the Illinois EPA will properly address any requirements for groundwater monitoring, corrective action and closure of the coal ash pond at the AER Grand Tower site.

Q. PLEASE SUMMARIZE THE ENVIRONMENTAL ISSUES RELATED TO THE NEWTON PLANT.

A. AER owns and operates the Newton Energy Center in Jasper County, located in the southeastern part of central Illinois approximately 7 miles southwest of the town of Newton. The coal-fired power plant currently operates one impoundment for CCP management purposes. To assess the potential for constituent migration from the impoundment, AER commissioned a hydrogeological study. The hydrogeological assessment report was filed with the Illinois Pollution Control Board on April 9, 2013, as part of AER rulemaking submission in R2013-019. The following observations are drawn from the report of the hydrogeological study.

The plant's sole CCP impoundment, consisting of a Primary Ash Pond and Secondary Ash Pond, was constructed in 1977 and has a design capacity of approximately 9,715 acre-feet for the primary pond and 83.6 acre-feet for the secondary pond. The Primary Ash Pond has a surface area of 400 acres and a height of approximately 71 feet above grade. The Secondary Ash Pond has an area of 9.3 acres and a height of approximately 29 feet above grade. The CCP impoundment was not excavated during construction except for native materials used to build the containment berms. The impoundment receives bottom ash, fly ash, and low-volume wastewater (LVW) from the plant's two coal-fired boilers and operates under NPDES Permit IL0049191, Outfall 001.

Other CCP management facilities at the plant include a landfill with a closed Phase 1 cell and an inactive Phase 2 cell. The Phase 1 cell, built in 1977, is unlined, and accepted sodium-based flue gas desulfurization (FGD) wastes mixed with fly ash and lime. Phase 1

was closed in 1999 with a 40-millimeter thick geomembrane cap and currently has a Groundwater Management Zone (GMZ) established. Following a switch to western coal in 1997, the Phase 2 cell began receiving coal ash that same year and continuing until 2011. The Phase 2 cell has a geomembrane liner with a leachate collection system.

The primary conclusions from voluntary monitoring of groundwater at the Newton CCP impoundment are:

- The CCP impoundment is underlain by clay-rich deposits that are more than 20 feet thick. These clay-rich soils generally restrict migration of leachate from the impoundment to surrounding groundwater.
- Groundwater elevations at the site mimic land surface topography and do not provide an indication of horizontal groundwater flow direction. However, groundwater elevations at the wells are higher than water elevation in Newton Lake and lower than water elevation in the impoundment, which suggests that groundwater flow is from the impoundment to Newton Lake.
- These groundwater elevation observations and the conceptual model of groundwater flow indicate that there is no potential for off-site migration from the CCP impoundment.
- There are no water wells between the CCP impoundment and Newton Lake, indicating that there are no potential groundwater receptors downgradient of the CCP impoundment.
- There have been exceedances of Class I groundwater quality standards for sulfate, TDS and manganese; however, I note that neither Illinois nor USEPA has

established primary drinking water standards for boron, sulfate or TDS, recognizing the lack of toxicity associated with such parameters.

Based upon the hydrogeological studies at the site, the report concluded and it is my opinion that the coal ash ponds at the AER Newton station are not adversely impacting any drinking water supply or Newton Lake and do not pose a public health risk. The rulemaking to be filed with the Illinois Pollution Control Board by the Illinois EPA will properly address any requirements for groundwater monitoring, corrective action and closure of the coal ash ponds at the AER Newton site.

Q. PLEASE SUMMARIZE THE ENVIRONMENTAL ISSUES RELATED TO THE MEREDOSIA PLANT.

A. AER owns and operates the Meredosia Power Station in Morgan County, Illinois. The Meredosia Power Station formerly operated three coal-fired boilers. Operation of the two smaller units was suspended in 2003, and the larger unit ceased operation in February 2012. The plant, which generated electricity from 1948 until February 2012, is located on the floodplain on the east side of the Illinois River.

The plant has three coal ash impoundments – a Bottom Ash Pond, a Fly Ash Pond, and a closed Old Ash Pond. The impoundments are no longer utilized for coal ash management. To assess the potential for constituent migration from the impoundments, AER commissioned a hydrogeological study. The hydrogeological assessment report was filed with the Illinois Pollution Control Board on April 9, 2013, as

part of AER rulemaking submission in R2013-019. The following observations are drawn from the report of the hydrogeologic study.

The major surface water body in the vicinity is the Illinois River, which flows from north to south and is located less than 200 feet west of the Bottom Ash and Fly Ash Ponds.

All active water supply wells within 2,500 feet of the coal ash impoundments, other than plant production wells, are southwest and upgradient of the impoundments. Monitoring well APW-5 lies between the impoundments and these wells and shows no evidence of groundwater quality impacts from the impoundments. The closest community water supply wells are either more than one-half mile upgradient or one mile sidegradient, in positions where groundwater beneath the coal ash impoundments cannot reasonably be expected to flow given the predominant northwest flow direction observed at the site. These observations indicate no potential for groundwater receptors downgradient of the coal ash impoundments.

Groundwater in the vicinity of the coal ash impoundments discharges to the Illinois River. A mixing calculation was performed to conservatively estimate the impact of boron and arsenic discharge to the river on concentrations in river water. The result of the boron calculation based on maximum concentration, maximum hydraulic gradient, and river flow is a very conservative estimate of the increase in boron loading to the Illinois River. This result (0.27 mg/L) suggests that a measurable boron increase could occur near shore for worst case conditions at low flow. However, the incremental increase of 0.0035 mg/L calculated using median concentration, median hydraulic

gradient, and median annual river discharge is lower than the instrument detection limit for boron and suggests that the impact will not be measurable under typical conditions.

The calculations for arsenic suggest that it may be measurable in river water under worst case conditions (incremental increase of 0.0018 mg/L), assuming that it does not precipitate or sorb from solution prior to reaching the groundwater/surface water interface. However, under typical conditions, arsenic will not have a measurable impact (incremental concentration increase of 0.000033 mg/L) on concentrations within the Illinois River.

The primary conclusions from voluntary monitoring of groundwater at the Meredosia Power Station coal ash impoundments are:

- Groundwater flow at the site was northwest toward the Illinois River during all events in which it could be measured.
- Based on consistent hydraulic gradients to the northwest (toward the Illinois River), there is no evidence of off-site migration, and there are no potential groundwater receptors downgradient of the coal ash impoundments.
- Calculated boron loading to the Illinois River estimates that the incremental boron concentration increase in the river caused by leachate released from the coal ash impoundments may be measurable under worst-case conditions, but not under typical conditions.

- Calculated arsenic loading to the river estimates that it is less likely to result in a measurable concentration increase under worst case conditions than boron and will not be measureable under typical conditions.
- There have been exceedances of Class I groundwater quality standards for boron and arsenic. Although there is an Illinois and federal primary drinking water standard for arsenic, there is no Illinois or federal primary drinking water standard for boron.

Based upon the hydrogeological studies at the site, the report concluded and it is my opinion that the coal ash ponds at the AER Meredosia station are not adversely impacting any drinking water supply or the Illinois River and do not pose a public health risk. The rulemaking to be filed with the Illinois Pollution Control Board by the Illinois EPA will properly address any requirements for groundwater monitoring, corrective action and closure of the coal ash ponds at the AER Meredosia site.

Q. WITH REGARD TO AER'S RESPONSE TO THE VNs ISSUED TO COFFEEN, GRAND TOWER, NEWTON AND MEREDOSIA, WHAT IS YOUR OPINION AS TO AER'S ABILITY TO RESOLVE ANY CONCERNS ON THE PART OF THE ILLINOIS EPA?

A. AER responded to the VNs at these four stations in a very responsible and pro-active manner by filing a request for a site-specific rule change that would institute, for the first time, environmental standards for the closure of sixteen ponds at eight AER power generating stations in Illinois. As noted, these VN's arose from voluntary groundwater monitoring undertaken by AER despite there having been no general groundwater

monitoring requirements in place. AER's commitments with regards to its stations caused the Illinois EPA to recognize the need for a rule of general applicability that would apply to all coal ash ponds at electric power generating stations in Illinois. Illinois EPA is proceeding to develop a proposal for a general rule, with AER's support, to be filed with the Illinois Pollution Control Board. Compliance with Part 841 after it is adopted as a rule, will resolve the Illinois EPA concerns with regards to the VNs.

Q. WERE ISSUES RAISED BY THOSE TESTIFYING AT THE LOCAL PUBLIC HEARINGS RELATING TO OTHER AER PLANTS IN ILLINOIS?

A. Yes, Ms. Susan Cunningham provided her characterization of an Illinois Attorney General complaint, which appears based on newspaper articles she has read, involving AER's Duck Creek plant. Ron Trimmer made comments regarding the Joppa plant, and Ms. Nohl-Smith discussed groundwater monitoring at the Venice plant owned by Ameren Missouri.

Q. PLEASE SUMMARIZE THE CASE FILED BY THE ATTORNEY GENERAL'S OFFICE RELATIVE TO THE DUCK CREEK POWER PLANT.

A. On February 4, 2013, the Illinois Attorney General's Office filed an enforcement action against AER. This enforcement action was based on activities that occurred in 2004-2005 when AER constructed a rail line on its property to service the Duck Creek plant. AER used soils and coal ash as structural fill to support the rail line. The rail track length is approximately 5 miles long and coal ash was used as structural fill in the first mile of the rail line in an area that was historically used for strip mining. Approximately 163,000

cubic yards of coal ash was transported to the Duck Creek plant from AER's E.D. Edwards power plant approximately 15 miles away and used as structural fill. Under Section 3.135 of the Environmental Protection Act, Illinois allows the beneficial use of coal ash as structural fill.

The Attorney General's case filed in 2013 is based on allegations that AER did not follow the procedural steps outlined in Section 3.135 to obtain a beneficial use determination (BUD) from the Agency. AER recently filed (August 8, 2013) a BUD request with the Agency to help with resolution of this matter. The AER demonstration shows that the use of the coal ash as structural fill is not causing a violation of Illinois groundwater standards and is not threatening any drinking water. The nearest drinking water well is 2,300 feet upgradient from where the coal ash was used as structural fill.

Q. DOES THIS MATTER HAVING ANYTHING TO DO WITH COAL ASH IMPOUNDMENTS OR UTILITY WASTE LANDFILLS?

A. No. Coal combustion products deposited in a utility waste landfill are those that could not be beneficially used or moved off-site. Because they cannot be used beneficially, these products must be disposed of in a dry and solid form in the landfill.

Q. YOU TESTIFIED EARLIER THAT THE JOPPA PLANT WAS DISCUSSED AT THE LOCAL PUBLIC HEARING. PLEASE SUMMARIZE ENVIRONMENTAL RESULTS RELATING TO GROUNDWATER AT THE JOPPA PLANT.

A. Electric Energy Incorporated (EEI), a subsidiary of AER, owns and operates the Joppa Generating Station west of the Village of Joppa and northeast of the Ohio River in Massac County, Illinois. The coal-fired plant currently operates one impoundment for CCP management purposes, and has another impoundment that is no longer in service. To assess the potential for constituent migration from the impoundments, AER commissioned a hydrogeological study. The hydrogeological assessment report was filed with the Illinois Environmental Protection Agency on July 24, 2013.

The primary conclusions from voluntary monitoring of groundwater at the Joppa Generating Station CCP are:

- Past operation of the West Ash Pond, no longer in service, has caused a localized exceedance of Class II groundwater quality standards for boron. There is no Illinois or federal primary drinking water standard for boron.
- There are no exceedances attributed to the East Ash Pond, which is currently in service.
- The impoundments are underlain by more than 50 feet of clay-rich deposits. These clay-rich soils restrict migration of leachate from the impoundment to surrounding groundwater.
- Drinking water in the area is provided by the Joppa and Ft. Massac Water Districts.
- There are no potential receptors downgradient, and potential receptors are unlikely within 2,500 feet sidegradient of the East Ash Pond.

- There are no potential receptors directly downgradient of the West Ash Pond. There are active non-potable wells sidegradient and within 2,500 feet of the west impoundment. These wells are used for sinks and showers, but not for drinking water supply. The Station's non-potable water supply wells are the closest water wells downgradient of the CCP impoundments. Water quality data for the Station wells and the closest community water supply well (3,000 feet sidegradient of the east impoundment) do not indicate evidence of impacts from the CCP impoundments after more than 50 years of service.

Q. PLEASE SUMMARIZE ENVIRONMENTAL RESULTS RELATING TO GROUNDWATER AT THE VENICE PLANT.

A. Ameren Missouri has implemented an Illinois EPA-approved closure plan for its former ash ponds located at the Venice Generating Station. The Venice Station is located in the Village of Brooklyn, Illinois, on the boundary between Madison and St. Clair Counties along the bank of the Mississippi River. Ameren Missouri is also implementing an Illinois EPA-approved groundwater management zone (GMZ) at the Venice Station. While I was still employed at Illinois EPA, I participated in a meeting with Ameren Missouri where we discussed the regulatory mechanism for closure of the Venice ash ponds. Rather than have Ameren Missouri propose a site specific rulemaking for approval by the Illinois Pollution Control Board, Illinois EPA determined that closure could occur without such a regulatory filing and that the establishment of a GMZ, capping of the ponds and adequate monitoring addressed site conditions. I also note that the Village of Brooklyn,

recognizing the historically industrial nature of the area, prohibits groundwater usage for anything other than industrial processes.

Closure of the ponds was approved complete as of October 31, 2012. Ameren submitted the Construction Quality Assurance Report and the Post Closure Care Plan in November 2012 to Illinois EPA. The first annual post-closure report (including groundwater monitoring trend analyses) will be submitted by March 31, 2014.

Q. DO YOU HAVE AN OPINION AS A FORMER REGULATOR REGARDING WHETHER AER AND AMEREN MISSOURI HAVE APPROPRIATELY MANAGED THEIR COAL ASH IMPOUNDMENTS IN ILLINOIS?

A. Yes. It is my professional opinion that AER and Ameren Missouri have appropriately managed their coal ash impoundments in Illinois. AER and Ameren Missouri have taken and continue to take steps relative to their coal ash ponds in Illinois to assure that human health and the environment are protected. These include voluntarily monitoring groundwater, performing hydrogeological studies on potential impacts, development of a program through a proposed site specific rulemaking to close AER coal ash ponds in Illinois, and assisting the Illinois EPA with the development of a general rule applicable to all coal ash ponds in Illinois.

Q. DOES THIS CONCLUDE YOU SURREBUTTAL TESTIMONY?

A. Yes, it does.

BEFORE THE PUBLIC SERVICE COMMISSION
OF THE STATE OF MISSOURI

In the Matter of the Application of Union Electric Company d/b/a Ameren Missouri for Permission and Approval and a Certificate of Public Convenience and Necessity Authorizing it to Construct, Install, Own, Operate, Maintain, and Otherwise Control and Manage A Utility Waste Landfill and Related Facilities at its Labadie Energy Center.	))))))))	File No. EA-2012-0281

AFFIDAVIT OF GARY KING

STATE OF ILLINOIS)
) **ss**
COUNTY OF SANGAMON)

Gary King, being first duly sworn on his oath, states:

1. My name is Gary King. I work in the City of Springfield, Illinois, and I am employed by the environmental consulting firm ARCADIS U.S., Inc.

2. Attached hereto and made a part hereof for all purposes is my Surrebuttal Testimony on behalf of Union Electric Company d/b/a Ameren Missouri consisting of 26 pages, all of which have been prepared in written form for introduction into evidence in the above-referenced docket.

3. I hereby swear and affirm that my answers contained in the attached testimony to the questions therein propounded are true and correct.

Gary King
Gary King

Subscribed and sworn to before me this 11th day of September, 2013.

Karen A. Hoffman
Notary Public

My commission expires: 2/24/2016

OFFICIAL SEAL
KAREN A. HOFFMAN
NOTARY PUBLIC, STATE OF ILLINOIS
MY COMMISSION EXPIRES 2-24-2016

ARCADIS

Education
Juris Doctor (J.D.) Valparaiso University, 1977

Bachelor of Science in Civil Engineering (B.S.C.E.) Valparaiso University, 1974

Years of Experience
Total - 34

Professional Registrations
Attorney at Law, State of Illinois, 1977

Professional Qualifications

Recipient, 2012 Lifetime Achievement Award, Association of State and Territorial Solid Waste Management Officials (ASTSWMO) ,

Chair, CERCLA and Brownfields Subcommittee, Association of State and Territorial Solid Waste Management Officials (ASTSWMO) , 2001-2008

Gary King

Regulatory Strategy/Technical Expert

As a senior manager with a state environmental regulatory agency (Illinois Environmental Protection Agency), for over 20 years Gary King managed the development and implementation of environmental statutes, regulations, and policies to achieve effective and efficient site remediation. Mr. King managed the work of a large group of engineers and scientists investigating and cleaning up environmental contamination under a broad range of state and federal programs, statutes and regulations. These programs included the implementation of CERCLA laws and regulations at all NPL sites in Illinois, .from identification and RI/FS through remedial action, close-out and five year review. The Illinois NPL sites included several former municipal landfills that had accepted industrial wastes. Mr. King developed strong working relationships with senior CERCLA managers at USEPA Region 5 and at the Indiana Department of Environmental Management..

Mr. King established the state risk- based remediation methodology in Illinois known as TACO (Tiered Approach to Corrective Action Objectives). TACO proved to be a nationwide model for addressing environmental contamination in a logical, cost-effective, time-efficient manner.

Mr. King created and implemented the Illinois voluntary cleanup program, brownfield assistance program, and leaking underground storage tank program . The Illinois voluntary cleanup program (known as the Site Remediation Program) is considered by users as one of the best of its kind in the nation. The Illinois leaking underground storage tank program has consistently been at the top in the nation in terms of closures achieved annually.

Mr. King has frequently presented information and testimony on state programs on environmental contamination of land at meetings, conferences, and hearings involving federal, state and local government agencies, industry officials and public groups.

Before becoming a senior manager for environmental cleanup programs, Mr. King was a senior legal advisor at Illinois EPA managing enforcement strategy and regulatory work.

Category of Experience

Adoption of TACO (Tiered Approach to Corrective Action Objectives)
Illinois Environmental Protection Agency
1997

EXHIBIT A

Served as team leader in developing a regulation that put in place the most comprehensive approach to risk based remediation objectives of any State in U.S. TACO is applied across the board to RCRA Subtitle C, LUST and VC P programs. TACO accelerated cleanups in Illinois allowing for more cost effective cleanups and more land reuse opportunities. Project met within statutory mandate times.

Establishment of State Voluntary Cleanup Program
Illinois Environmental Protection Agency
1997
Served as team leader in developing regulations that established the Illinois Site remediation Program in Illinois (State Voluntary Cleanup Program) Project met within statutory mandate times.

Revisions to TACO (Tiered Approach to Corrective Action Objectives)
Illinois Environmental Protection Agency
2006
Served as team leader in developing regulatory revisions to TACO that incorporated background standards for metals and PNAs. Rules also updated to account for advances in science relative to contaminant human health risks.

Proposed Regulations to Incorporate Vapor Intrusion In TACO
Illinois Environmental Protection Agency
2011
Served as team leader in developing a regulatory system for incorporating vapor intrusion remediation objectives into TACO in a practical, cost effective, risk based approach.

Chair, CERCLA and Brownfields Subcommittee
Association of State and Territorial Waste Management Officials
2001-2008
Team leader for a group of 70 nationwide state employees working as volunteers on seven separate focus groups researching state and federal cleanup projects and programs