BEFORE THE ILLINOIS POLLUTION CONTROL BOARD

IN THE MATTER OF:

PROPOSED SITE SPECIFIC RULE FOR CITY OF SPRINGFIELD, ILLINOIS, OFFICE OF PUBLIC UTILITIES, CITY WATER, LIGHT AND POWER AND SPRINGFIELD METRO SANITARY DISTRICT FROM 35 ILL. ADM. CODE SECTION 302.208(g)	)	R09-8 (Site Specific Rulemaking – Water)

NOTICE OF FILING

TO: Mr. John Therriault
Assistant Clerk of the Board
Illinois Pollution Control Board
100 West Randolph Street
Suite 11-500
Chicago, Illinois 60601
(VIA ELECTRONIC MAIL)

Marie E. Tipsord
Hearing Officer
Illinois Pollution Control Board
James R. Thompson Center
100 West Randolph, Suite 11-500
Chicago, Illinois 60601
(VIA U. S. MAIL)

PLEASE TAKE NOTICE that I have today filed with the Office of the Clerk of the Illinois Pollution Control Board PRE-FILED TESTIMONY OF DAVE FARRIS, IN SUPPORT OF PROPOSED SITE SPECIFIC RULE; PRE-FILED TESTIMONY OF GREGG FINIGAN, IN SUPPORT OF PROPOSED SITE SPECIFIC RULE; PRE-FILED TESTIMONY OF DOUG BROWN, IN SUPPORT OF PROPOSED SITE SPECIFIC RULE; PRE-FILED TESTIMONY OF DON SCHILLING, IN SUPPORT OF PROPOSED SITE SPECIFIC RULE; PRE-FILED TESTIMONY OF WILLIAM BROWN, IN SUPPORT OF PROPOSED SITE SPECIFIC RULE; PRE-FILED TESTIMONY OF DEBORAH RAMSEY, IN SUPPORT OF PROPOSED SITE SPECIFIC RULE; and PRE-FILED TESTIMONY OF JEFF BUSHUR, IN SUPPORT OF PROPOSED SITE SPECIFIC RULE, a copy of which are herewith served upon you.

Respectfully submitted,

CITY OF SPRINGFIELD, ILLINOIS,
OFFICE OF PUBLIC UTILITIES,
CITY WATER, LIGHT AND POWER
and
SPRINGFIELD METRO SANITARY
DISTRICT,

By: /s/ Christine G. Zeman
One of Their Attorneys

Date: October 20, 2008

Katherine D. Hodge
Christine G. Zeman
HODGE DWYER ZEMAN
3150 Roland Avenue
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(217) 523-4900

BEFORE THE ILLINOIS POLLUTION CONTROL BOARD

IN THE MATTER OF:

PROPOSED SITE SPECIFIC RULE FOR CITY OF SPRINGFIELD, ILLINOIS, OFFICE OF PUBLIC UTILITIES, CITY WATER, LIGHT AND POWER AND SPRINGFIELD METRO SANITARY DISTRICT FROM 35 ILL. ADM. CODE SECTION 302.208(g)	)	R09-8 (Site Specific Rule – Water)

PRE-FILED TESTIMONY OF DAVE FARRIS,
IN SUPPORT OF PROPOSED SITE SPECIFIC RULE

NOW COMES the Petitioners, City of Springfield, Illinois ("City"), Office of Public Utilities, City Water, Light and Power ("CWLP") and Springfield Metro Sanitary District ("SMSD") (collectively "Petitioners"), by and through their attorneys, HODGE DWYER ZEMAN, and pursuant to 35 Ill. Adm. Code § 102.424 and the Hearing Officer Order, dated September 19, 2008, submits the following Pre-Filed Testimony of Dave Farris for presentation at the November 3, 2008 hearing scheduled in the above-referenced matter.

TESTIMONY OF DAVE FARRIS

My name is Dave Farris. I am employed at CWLP as the Environmental Health and Safety Manager. I have over thirty years of experience in the area of environmental health and safety. I hold a Bachelor of Science in Industrial Technology with an emphasis in Occupational Safety from Illinois State University, a Master of Business Administration from Sangamon State University (which is now known as the University of Illinois at Springfield), and a Master of Science in Industrial Hygiene from Central Missouri State University. My current resume is attached.

My testimony today concerns a description of CWLP's facility; CWLP's National Pollutant Discharge Elimination System ("NPDES") permit and the limits therein; an overview of CWLP's boron mitigation efforts; and an overview of CWLP's consideration of alternatives and alternative technologies.

CWLP owns and operates two power stations, referred to as the V.Y. Dallman Power Station ("Dallman") and the Lakeside Power Station ("Lakeside"), and a potable water treatment plant at 3100 Stevenson Drive, Springfield, Sangamon County, Illinois. These plants generate electricity for the residents and businesses in Springfield and provide potable water to Springfield and surrounding communities. Approximately 186 people are employed at Dallman and Lakeside, and an additional 19 people are employed at the potable water treatment plant. The facilities are staffed twenty-four hours per day, seven days per week.

Dallman has an electric generating capacity of 352 megawatts and is comprised of three coal-fired units: Units 31, 32, and 33. The Dallman units were placed into service in 1968, 1972, and 1978, respectively. Units 31 and 32 are identical, each having 80 megawatts of generating capacity. The cyclone boilers in Units 31 and 32 operate at 1,250 psig and 950°F. Unit 33 includes a tangentially fired boiler and has a generating capacity of 192 megawatts. Unit 33 operates at 2,400 psig and 1,000°F. Each of the three Dallman units is equipped with a flue gas desulfurization system ("FGDS") that removes over 90 percent of the sulfur dioxide from the unit's flue gases. Selective Catalytic Reduction ("SCR") air pollution control systems for nitrogen oxides ("NO_x") removal were added to all three Dallman Units in 2003. CWLP currently operates the SCRs during the ozone season (May 1 through September 30) to remove approximately

90 percent of NO_x from its air emissions at the Dallman units. The SCRs will begin year-round operations in July 2009, to assist in control of the mercury emissions.

Lakeside began operation in 1935. Originally, there were eight boilers and seven turbine generators at Lakeside. Only two boilers and two turbine generators are still in operation. Boilers 7 and 8 are identical 33-megawatt cyclone coal-fired units. Boiler 7-Turbine 6 went into operation in 1959, and Boiler 8-Turbine 7 began operation in 1964. Both units operate at 850 psig and 900°F. Lakeside will be retired in the near future.

Total coal consumption at the CWLP facility averages 1.1 million tons per year. The ash handling practices at CWLP are typical for a coal-fired power plant. Bottom ash and fly ash from all existing units are sluiced to ash ponds. The raw lake water used for sluicing is obtained from the once-through cooling water systems for generator condensers. Three separate ash transport systems serve Dallman Units 31 and 32, Dallman Unit 33, and Lakeside.

CWLP operates two ash ponds. Typically, the Dallman fly ash and bottom ash sluice water is pumped to the north ash pond, which is commonly known as the Dallman Ash Pond. Dallman Ash Pond also receives wastewater treatment plant sludge and leachate collected from the scrubber sludge landfill adjacent to the ash ponds. The south ash pond, known as Lakeside Ash Pond, has an earthen berm dividing it into an east and west portion. The Lakeside fly ash and bottom ash sluice water is normally discharged to the west portion of the Lakeside Ash Pond. The east portion of the pond, referred to as Lakeside East Pond, receives lime sludge from the filter plant and miscellaneous water streams from Dallman, including the FGDS effluent water. Flow rates into the ash ponds vary, but depend principally upon the generating units in service.

A new electric generating unit, referred to as Dallman Unit 4, is currently under construction. The Dallman Unit 4 will include a coal-fired boiler with a rated capacity of about 2,440 million Btu/hour and a steam turbine-generator with a nominal capacity of 250 megawatts. The new boiler will be equipped with low-NO_x combustion technology and the following air pollution control systems: SCR, a fabric filter, wet flue gas desulfurization, and a wet electrostatic precipitator. Dallman Unit 4 will utilize a dry ash handling system.

CWLP's potable water treatment plant has a capacity of 48 million gallons per day. A conventional lime-softening/filtration/disinfection process is employed to produce potable water. Five clarifiers and 12 filters in the treatment process remove sediment and particulate matter from the raw lake water. Thickened sludge from the clarifiers and backwash water from the filters is discharged to ash ponds located north of Spaulding Dam. The volume of sludge and backwash water discharged to the ash pond system varies and is dependent upon production volume and raw water characteristics. During periods of warm weather, powdered activated carbon ("PAC") is added to the incoming lake water for control of various pesticides and herbicides. The PAC also assists with taste and odor control. The majority of the PAC is removed in the clarifiers and disposed in the ash ponds.

Lake Springfield, a 4,224-acre reservoir constructed in 1934 by impoundment of Sugar Creek with Spaulding Dam, supplies the cooling water for the CWLP complex, which is also the primary source of potable water for the City of Springfield and surrounding communities. The two major streams flowing into Lake Springfield are Sugar Creek and Lick Creek, which drain into the lake's upper end. The majority of the

consumptive use of lake water for the CWLP complex is ash sluicing water, accounting for 3.9 million gallons of lake water usage per day. Supernatant from the two ash ponds, which receive a variety of materials, including miscellaneous water streams from Dallman and Lakeside and the FGDS effluent water, flows into a clarification pond, which also provides settling and neutralization, before it discharges into Sugar Creek under a NPDES permit issued by the Illinois Environmental Protection Agency ("IEPA").

In a renewal to CWLP's NPDES permit issued in 1991, IEPA placed a boron limit on discharges from the clarification pond. On May 4, 1994, CWLP filed a petition with the Illinois Pollution Control Board ("Board") seeking an adjusted standard from the Board's water quality standard for boron that was, at that time, found at 35 Ill. Adm. Code 302.208(e). On December 1, 1994, the Board granted CWLP an adjusted standard for boron of 11.0 mg/l for wastewater discharges into Sugar Creek (Outfalls 003 and 004) with downstream decreases in the receiving waterways until compliance was reached with the general water quality standard of 1.0 mg/l. The adjusted standard included an alternative water quality standard for boron at the point of discharge from SMSD Spring Creek Sanitary Treatment Plant ("Spring Creek Plant") (Outfall 007) to 100 yards downstream of the confluence of the Sangamon River with Spring Creek. Thus, an alternative water quality standard for boron already applies to portions of the surface waters at issue in this matter.

From 1994, when the adjusted standard was granted, until May 2003, CWLP operated within general compliance of its NPDES Permit IL0024767. However, beginning in May 2003, CWLP began experiencing boron exceedances (above 11.0

mg/L) at Outfall 004, coinciding with the testing and start of SCR air pollution control systems.

Subsequent to a meeting with IEPA in July 2003, CWLP committed to a further investigation of the process chemistry and interaction of the constituent wastewater streams; it investigated the component effluent streams of Outfall 004, to identify the wastewater streams with high boron content. CWLP used both internal resources and those of Hanson Professional Services Inc. ("Hanson") to conduct this investigation. The investigation demonstrated that the FGDS blowdown, or the scrubber return water, which is generated from de-watering the scrubber solids (gypsum), was a primary culprit in causing high boron levels in the ash pond. Levels above 500 mg/L were identified in this waste stream. The FGDS blowdown material is generated by dewatering the scrubber solids (synthetic gypsum product) for ease of handling and subsequent reuse. This involves the daily release of approximately 200,000 gallons of FGDS blowdown liquid at the average daily rate of 100 gallons per minute. CWLP remained in correspondence with IEPA concerning the investigation and its progress in identifying problem areas.

On November 25, 2003, CWLP received a violation notice ("VN") from IEPA (VN W-2003-00471). CWLP responded to the VN on January 12, 2004. In its written response, CWLP explained that it had retained Hanson to investigate the causes of the boron exceedances, and would continue to work with Hanson to characterize the wastewater streams of Outfall 004 with the SCRs in operation, and after they had been shut down following the ozone season. On February 11, 2004, IEPA accepted CWLP's Compliance Commitment Agreement ("CCA") and required CWLP to present a report to IEPA by March 15, 2004, which it met.

CWLP submitted findings to IEPA of additional investigative sampling, which confirmed that a highly significant contributor of boron to Outfall 004 was the FGDS blowdown wastewater stream, or scrubber return water from the gypsum de-watering system. On July 28, 2004, CWLP proposed to IEPA a three-prong approach to solving the boron exceedance issue, including a proposal to engineer and design a temporary treatment facility for the FGDS wastewater stream, while a permanent facility was investigated and would be included in the construction of the new Dallman Unit 4. A target operational date of May 2005 was proposed. In the interim, for the remainder of the 2004 ozone season, CWLP committed to continuously operate the Lakeside sluice pumps which discharge into the ash ponds and ultimately through Outfall 004, so as to provide additional flow for Outfall 004, in an attempt to minimize the effect of the FGDS wastewater stream. It should be noted that CWLP's efforts to find a vendor capable of supplying a temporary treatment system for this wastewater stream was unfruitful because of the complexity of the waste stream and lack of proven effective technology.

In early 2005, CWLP retained Burns & McDonnell ("Burns") to investigate the availability and feasibility of permanent wastewater treatment options. The outcome of this study provided recommendations to CWLP to pursue a brine concentrator and spray dryer absorber. In October 2006, CWLP met with IEPA to discuss the current status of the boron mitigation project. CWLP requested to amend the project implementation schedule as the application of this technology was very unique and the consulting engineer and vendor encountered issues that required significant changes in the project on a regular basis. The technology was now determined to generate order of magnitudes more solid waste and the cost had expanded many times the original $13 million price

tag. CWLP requested six months, or until April 9, 2007, to fully evaluate all alternatives. The feasibility and cost assumptions for the brine concentrator are no longer valid.

In April 2007, CWLP met with IEPA and proposed to construct a pretreatment system for the FGDS blowdown consisting of a ClariCone^{TM}/clarifier and the addition of polymers. After pretreatment at the generating facility, this stream would be sent via force main to SMSD. CWLP requested a 90-day period, or until July 9, 2007, to pursue this strategy and submit to the Agency design and schedule information. CWLP would also have to consider the need to work with SMSD to identify permit implications.

In May 2007, at the request of the Agency, CWLP investigated the use of electrocoagulation for removal of boron from this waste stream. Vendors were identified and a bench top test was conducted utilizing this waste stream. The data generated from the test indicated that electrocoagulation would be prone to failure quickly, and that boron removal was minimal.

In July 2007, CWLP submitted a revised CCA utilizing the pretreatment facility at CWLP and a force main to send the wastewater stream to the SMSD Spring Creek Plant. Included in this process would be a request to the Board for a Site Specific Standard associated with the SMSD Spring Creek Plant for boron. IEPA accepted the revised CCA and granted an extension to attain compliance with the 2003 violation notice by August 2009. Documents relevant to my testimony related to the VN and CWLP's responses are in the record of this proceeding as Group Exhibit A attached to CWLP's Motion for Expedited Review.

I will be happy to answer any questions. Thank you.

Respectfully submitted,

CITY OF SPRINGFIELD, ILLINOIS,
OFFICE OF PUBLIC UTILITIES,
CITY WATER, LIGHT AND POWER

and

SPRINGFIELD METRO SANITARY
DISTRICT,

Date: October 20, 2008

By: /s/ Christine G. Zeman
One of Their Attorneys

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CWLP:002/Fil/Pre-Filed Testimony of Farris

RESUME

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SPRINGFIELD, ILLINOIS 62711
PHONE: (217) 787-9091 (Home)
(217) 757-8610 (Work)

WORK EXPERIENCE

February 1992 - Present
ENVIRONMENTAL HEALTH and SAFETY MANAGER
City Water, Light and Power, Springfield, Illinois
Responsible for management of Environmental Health and Safety staff of 10 people. Responsible for environmental compliance efforts in the areas of air, land, and water. Direct the activities of the safety and industrial hygiene programs of the utility. Steered the consolidation of the Environmental and Safety & Industrial Hygiene departments.

August 1993 - Present
VISITING INSTRUCTOR
Southern Illinois University, Carbondale, Illinois
Occupational Health and Safety and Managerial Supervision

January 1997 - December 2000
ADJUNCT FACULTY MEMBER (Graduate level courses)
Central Missouri State University, St. Louis, Missouri Campus
Industrial and Environmental Monitoring
Organization and Administration of Safety Programs
Principles of Industrial Hygiene

January 1983 - 1988
PART-TIME INSTRUCTOR
Lincoln Land Community College, Springfield, Illinois
Occupational Safety and Health Management and
Introduction to Business Organization

March 1990 - February 1992
SAFETY and INDUSTRIAL HYGIENE MANAGER
City Water, Light and Power, Springfield, Illinois
Responsible for focusing and organizing the industrial hygiene function at the utility. Emphasis given to OSHA compliance and establishing an ongoing industrial hygiene audit function for the utility. Supervise ongoing occupational safety programs.

March 1987 - March 1990
RISK MANAGER
City Water, Light and Power, Springfield, Illinois
Established the risk management program for the utility including the consolidation of the Insurance and Safety Offices into Risk Management. Surveyed and identified major sources of loss. Developed alternative risk management techniques to reduce dependence on primary insurance markets.

January 1980 - March 1987 — **SAFETY DIRECTOR**
City Water, Light and Power, Springfield, Illinois
Completely restructured the existing safety program. Responsibilities included all aspects of employee safety, accident prevention, fire safety, industrial hygiene, and workers' compensation. Responsible for direct supervision of professional employees in the Safety Office.

August 1978 - January 1980 — **SAFETY COORDINATOR**
Western Illinois University, Macomb, Illinois
Established an ongoing safety program which included fire safety and employee health and safety.

June 1977 - August 1978 — **LOSS CONTROL REPRESENTATIVE**
Crum and Forster Insurance, St. Louis, Missouri
Responsible for inspection and evaluation of risks from a fire safety, workers' compensation and liability standpoint.

EDUCATION

May 1993 — **Master of Science in Industrial Hygiene**
Central Missouri State University, Warrensburg, Missouri

December 1985 — **Master of Business Administration (MBA)**
Sangamon State University (now the University of Illinois at Springfield), Springfield, Illinois

May 1977 — **Bachelor of Science in Industrial Technology with emphasis in Occupational Safety**
Illinois State University, Normal, Illinois

PROFESSIONAL AFFILIATIONS, CERTIFICATIONS AND LICENSES

American Board of Industrial Hygiene	Certified Industrial Hygienist Certified in Comprehensive Practice
Board of Certified Safety Professionals	Certified Safety Professional Certified in Comprehensive Practice
State of Illinois Environmental Protection Agency	Licensed Industrial Hygienist Industrial Hygiene Examining Board Member
American Industrial Hygiene Association	Past President St. Louis Local Section
Instructor/Consultant	American Industrial Hygiene Association: Fundamentals of Industrial Hygiene Various Environmental Protection Agency sponsored or accredited asbestos training programs.

BEFORE THE ILLINOIS POLLUTION CONTROL BOARD

IN THE MATTER OF:

PROPOSED SITE SPECIFIC RULE FOR CITY OF SPRINGFIELD, ILLINOIS, OFFICE OF PUBLIC UTILITIES, CITY WATER, LIGHT AND POWER AND SPRINGFIELD METRO SANITARY DISTRICT FROM 35 ILL. ADM. CODE SECTION 302.208(g)	)	R09-8 (Site Specific Rule – Water)

PRE-FILED TESTIMONY OF GREGG FINIGAN,
IN SUPPORT OF PROPOSED SITE SPECIFIC RULE

NOW COMES the Petitioners, City of Springfield, Illinois, Office of Public Utilities, City Water, Light and Power ("CWLP") and Springfield Metro Sanitary District ("SMSD") (collectively "Petitioners"), by and through their attorneys, HODGE DWYER ZEMAN, and pursuant to 35 Ill. Adm. Code § 102.424 and the Hearing Officer Order, dated September 19, 2008, submits the following Pre-Filed Testimony of Gregg Finigan for presentation at the November 3, 2008 hearing scheduled in the above-referenced matter.

TESTIMONY OF GREGG FINIGAN

My name is Gregg Finigan. Since 2004, I have been employed at CWLP as the Superintendent of Production. In this position, I am responsible for operations of and personnel for the five electric generating units at the Dallman Power Station ("Dallman") and the Lakeside Power Station, the combustion turbine at the Interstate site, and all environmental control systems at Dallman. Previously, I was the Chemical Supervisor for CWLP, from 1988 to 2004. I hold Bachelor of Science degrees in Biology and Chemistry from Millikin University in Decatur, Illinois. My current resume is attached.

My testimony today concerns CWLP's power plant operations and CWLP's consideration of alternatives and alternative technologies as it relates to the chemistry at issue.

Boron is an element that is widespread in the environment but occurs naturally only in a combined form, usually as borax, colemanite, boronatrocalcite, and boracite. Boron exists in natural sediments as borosilicates, which are considered biologically inert. Boron is typically released to the environment slowly and at low concentrations by natural weathering processes. Most of the natural boron compounds usually degrade or are transformed by natural weathering of rocks to borates or boric acid, which are the main boron compounds of ecological significance. Boron is present in coal ash as various compounds. The boron compounds are captured in the sluiced coal ash and wet flue gas desulfurization system ("FGDS") blowdown, and because boron is very soluble in water, it may remain in the process waters for long periods.

On May 4, 1994, CWLP filed a petition with the Illinois Pollution Control Board ("Board") seeking an adjusted standard from the Board's water quality standard for boron that was, at that time, found at 35 Ill. Adm. Code 302.208(e). On December 1, 1994, the Board granted CWLP an adjusted standard for boron of 11.0 mg/L for process discharges into Sugar Creek (Outfalls 003 and 004) with downstream decreases in the receiving waterways until compliance was reached with the general water quality standard of 1.0 mg/L. The adjusted standard included an alternative water quality standard for boron at the point of discharge from SMSD Spring Creek Sanitary Treatment Plant ("Spring Creek Plant") (Outfall 007) to 100 yards downstream of the confluence of the Sangamon River

with Spring Creek. Thus, an alternative water quality standard for boron already applies to portions of the surface waters at issue in this matter.

Historically, CWLP has been able to operate while meeting the adjusted boron standard in Sugar Creek. However, since Selective Catalytic Reduction ("SCR") air pollution control systems for removal of nitrogen oxides were added to Dallman's three coal-fired units in 2003, CWLP has had difficulty complying with the adjusted standard for boron in Sugar Creek. The SCRs operate during the ozone season, from May 1 through September 30. Apparently, trace ammonia concentrations from SCR operation results in increased boron solubility in CWLP's Dallman ash pond, increasing boron levels to CWLP's clarification pond. The increased boron levels from the Dallman ash pond are below the adjusted standard, but when the boron content of the FGDS blowdown is added to the clarification pond, the boron concentration at Outfall 004 exceeds the adjusted standard in Sugar Creek. Although trace ammonia concentrations are also found in the gas stream to the FGDS, the effect on the boron concentration in the FGDS blowdown cannot be quantified since many other operational variables within the FGDS process result in a wide range of boron levels in the blowdown stream. Conversion to a dry fly ash system will not eliminate this high boron FGDS effluent, since it is generated by the air pollution control equipment (FGDS treats the flue gas product of burning coal) and is not associated with the fly ash disposal system.

As Superintendent of Production and Chemical Supervisor, I have been responsible for or involved in CWLP's efforts to investigate the effect of operation of the SCRs on increased boron concentrations and whether, or how, to mitigate the increases. I

was involved in investigating the SCR operations on increased boron concentrations at the Dallman ash pond and Outfall 004 to Spring Creek.

Prior to April of 2003, Outfall 004 showed minimal excursions beyond the adjusted standard of 11.0 mg/l boron limitation. In April 2003, CWLP put into service three SCR systems for nitrogen oxide removal at Dallman (on units 31, 32, and 33). At that time, I was the Chemical Supervisor at CWLP, and was in charge of process analysis and chemistry control of the new systems. Laboratory personnel were monitoring the ammonia concentrations (ammonia slip) in the ash systems and in the Dallman ash pond as part of the process control for the SCRs. In addition, the chemistry staff had responsibility for the National Pollutant Discharge Elimination System monthly monitoring. We took bi-monthly samples for boron analysis from Outfall 004 to Prairie Analytical.

By May, 2003 we noticed the boron concentration at Outfall 004 was increasing to nearly the 11.0 mg/l limitation. Later, in May, 2003, the boron concentration at Outfall 004 exceeded the adjusted standard limitation, at about the same time the last SCR went into service. At this point, we were fairly certain that the increase in boron levels was a direct result of the operation of the SCRs, since the increased levels coincided with the start-up of each SCR unit. We did some research on boron solubility and found a direct connection with ammonia having an affinity for boron compounds, forming more chemically stable ammonia borohalogens.

In August and September of 2003, we began investigating the cause of the boron increase by checking all of the ash ponds, the clarification pond, and Outfall 004 wastewater streams, as well as the incoming streams to these bodies to determine the

origin of the increased boron concentration. This study was done in conjunction with Hanson Engineering, which is now known as Hanson Professional Services Inc. During this extensive study of all of the wastewater streams feeding into Outfall 004 to Sugar Creek, it was determined that the boron levels in the Dallman ash pond had increased, but not to the levels that would have exceeded the adjusted standard of 11.0 mg/l. However, we were able to identify that the FGDS blowdown effluent stream contained excessive amounts of boron, from 16.4 to 837 mg/l. This effluent was found to be 250,000 – 400,000 gallons per day being sent to the filter plant sludge ponds, which subsequently discharge supernatant to the Clarification pond, which flows to Outfall 004.

This FGDS blowdown stream was present prior to the operation of the SCR systems. The increased boron concentration in the Dallman ash pond, which is the major flow contributor to the Clarification pond and Outfall 004, resulting from the operations of the SCRs and the ammonia effect on boron solubility, increased the boron level to the Clarification pond enough that the FGDS blowdown stream boron levels could not be diluted, even though it was only 10 percent of the ash pond flows. Accordingly, while this proposal will not eliminate CWLP's need for the adjusted standard, it is the most reasonable approach for CWLP to meet it hereafter.

I will be happy to answer any questions. Thank you.

Respectfully submitted,

CITY OF SPRINGFIELD, ILLINOIS,
OFFICE OF PUBLIC UTILITIES,
CITY WATER, LIGHT AND POWER

and

SPRINGFIELD METRO SANITARY DISTRICT,

Date: October 20, 2008

By: /s/ Christine G. Zeman
One of Their Attorneys

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CWLP:002/Fil/Pre-Filed Testimony of Finigan

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Personal

- Married, wife - Mary
- Three Children - Jennifer, P.J., and Michael

Education

- Graduate - Springfield Lanphier High School - 1974
- Graduate - Springfield College in Illinois - 1976
  Associate of Arts Degree (Biology/Chemistry/Pre-Med)
- Graduate - Millikin University - 1978 –
  Degrees - Bachelor of Science in Biology; Bachelor of Science in Chemistry
  Graduated Magna Cum Laude
  1st team Academic All -American Basketball Team - 1978 @ Millikin Univ.
- Graduate - Lincoln Land Community College - 1992
  Supervisory Management Certification Degree
- Post graduate work at Sangamon State University in the Computer Science and Business Administration curriculum.
- Continuing Education Credits earned from University of Illinois Electric Utility Conferences, EPRI Utility Chemistry Conferences, FGDS Users Group Workshops, various business seminars, and other chemistry and electric utility workshops and conferences.

Employment History – Gregory Finigan

- April 2004 to present — Superintendent of Production at City Water Light and Power
  Dallman and Lakeside Power Stations
  Full time position – supervising Unit Operations, FGDS, Material Handling, and Buildings and Grounds personnel at the Dallman and Lakeside Power stations. In charge of day to day Operation of the five electric generating units at Dallman and Lakeside, the combustion Turbine at the Interstate site, and all environmental control systems at Dallman power plant (FGDS, SCR).

- Jan 1988 to April 2004 — Chemical Supervisor at City Water Light and Power
  Dallman Power Station, Springfield, Ill.
  Full time position - supervising and coordinating the chemical staff and lab facilities at Dallman and Lakeside power stations. Directed projects to install on-line chemistry analysis, improve demineralizer systems, and plant /enhancement studies for the Dallman FGDS system. Assisted with project management in the construction, start-up, and initiation of a new FGDS at Dallman. Assisted with start-up and operation of three new SCR's at Dallman and directed the catalyst management project for the new SCR's.

- Oct. 2000 to present — Head Basketball Coach at Lincoln Magnet School (Jr. High) Springfield, Ill.
  Part time position – Head basketball coach for 8th grade boys program

- Aug. 1992 - Dec. 1995 — Consultant - Chemistry/Biology at NETCO, Inc.
  Springfield, Ill.

Part time position - consulting on environmental chemistry and biology projects, including underground storage tank removal, groundwater remediation, water treatment plant surveys and designs for federal grant requests.

- Nov. 1992 - Mar. 1995 Asst. Varsity girls Basketball Coach at Lanphier High School - Springfield, Ill.
  Part time position - as assistant basketball coach. Acted as interim head coach in 1992-93 and 94-95 seasons during maternity leave of head coach .

- Aug. 1990 - Oct. 1990 Head Golf Coach at Ursuline Academy, Springfield, Ill.
  Part time position - as head boys golf coach at Ursuline Academy High School.

- Dec. 1988 - Jan 1990 Chemistry Consultant at DTC, Inc, Springfield,Ill
  Part time position - assisting initial set-up of private environmental chemistry analysis lab. Analysis of environmental samples, supervision of on-site environmental analysis projects, and planning and design of remediation services.

- May 1981 - Jan. 1988 Chemist at Central Illinois Public Service Co, Central Lab, Springfield, Ill
  Full time position - Initially performing chemical analysis for five power stations in the CIPS system, including water treatment and sewage treatment facilities. From 3/86 - 1/88 acted as liason between the Central lab and the power station lab personnel, with responsibilities for chemistry projects such as boiler and condenser cleanings, pilot plant studies, method generation, and plant water cycle surveys.

- May 1978 - May 1981 Administrative Asst. in the Financial Institutions section, State of Illinois, Secretary of State
  Full time position - supervised 50-60 clerks processing license forms from financial institutions across the state of Illinois. Directed the shipping and inventory of license plates and stickers to the financial institutions.

Supplemental Information

- Vice chairman of University of Illinois Electric Utility Chemistry Workshop and a member of the program planning committee since 1988.
- Member of American Chemical Society, ASTM (Committees D-19 Water and D-05 Coal), ASME Power Plant and Environmental Chemistry Committee, and Sigma Zeta Science Fraternity
- Speaker - Pittsburgh Analytical Chemistry Conference, International Water Conference, U of I Electric Utility Chemistry Conference, and EPRI Cycle Chemistry Conference.
- Certified as a First Responder – Hazardous Materials Emergency after completion of University of Illinois Hazardous Materials 24 Hour Industrial Emergency Response Program - 2003
- Certified as a Class A/Special Waste Endorsement Landfill Operator by the State of Illinois EPA
- Certified under the Incident Command System by Illinois IEMA - 2003
- Standard First Aid and CPR Training - American Red Cross

BEFORE THE ILLINOIS POLLUTION CONTROL BOARD

IN THE MATTER OF:

PROPOSED SITE SPECIFIC RULE FOR CITY OF SPRINGFIELD, ILLINOIS, OFFICE OF PUBLIC UTILITIES, CITY WATER, LIGHT AND POWER AND SPRINGFIELD METRO SANITARY DISTRICT FROM 35 ILL. ADM. CODE SECTION 302.208(g)	)	R09-8 (Site Specific Rule – Water)

PRE-FILED TESTIMONY OF DOUG BROWN,
IN SUPPORT OF PROPOSED SITE SPECIFIC RULE

NOW COMES the Petitioners, City of Springfield, Illinois, Office of Public Utilities, City Water, Light and Power ("CWLP") and Springfield Metro Sanitary District ("SMSD") (collectively "Petitioners"), by and through their attorneys, HODGE DWYER ZEMAN, and pursuant to 35 Ill. Adm. Code § 102.424 and the Hearing Officer Order, dated September 19, 2008, submits the following Pre-Filed Testimony of Doug Brown for presentation at the November 3, 2008 hearing scheduled in the above-referenced matter.

TESTIMONY OF DOUG BROWN

My name is Doug Brown. I am employed at CWLP as the Projects Director. I have fourteen years of experience in the field of electrical engineering and as an engineer with CWLP. I hold a Bachelor of Science degree in Electrical Engineering from the University of Illinois at Urbana-Champaign, and I am currently obtaining my Master of Business Administration from the University of Illinois at Urbana-Champaign. As the Projects Director, I direct project managers, engineers, and engineering technicians to work as project teams in order to manage projects within technical requirements, budgets,

and schedules. I also coordinate both internal and external resources of CWLP, such as outside consulting firms and various city departments. My current resume is attached.

My testimony today concerns CWLP's boron mitigation efforts; CWLP's consideration of alternatives and alternative technologies, including switching to non-Illinois coal (and the associated economic impacts); and the economies of the site-specific standard as proposed. CWLP's power plants generate electricity for the residents and businesses in Springfield and provide potable water to the City of Springfield and surrounding areas.

In December 2005, a project engineer under my supervision started to work for the manager of the Boron Mitigation Project. The project engineer kept me informed on the general progress while under the direction of this project manager. In the fall of 2006, I assumed the project manager position for the Boron Mitigation Project.

Over the past decade, CWLP, together with Burns & McDonnell ("Burns") has investigated numerous alternatives to comply with the general water quality standard for boron in wastewater discharged from its power plant and determined that pumping its flue gas desulfurization system ("FGDS") wastewater stream to the SMSD's Spring Creek Sanitary Treatment Plant ("Spring Creek Plant") for treatment is the only technologically feasible and economically reasonable alternative to address the boron exceedance problem in the wastewater stream.

CWLP considered conversion to a dry ash system; however, the FGDS wastewater proposed for transfer to SMSD's Spring Creek Plant is generated by the air pollution control system and would not be eliminated by modifying the power plant ash

handling system, although CWLP's new Dallman Unit 4 will include dry fly ash and bottom ash handling systems.

In 2005, Burns estimated that the installed equipment cost to convert all of CWLP's existing Dallman units to dry fly ash would be $10.2 million. With added operational costs due to additional equipment and operations, along with collected ash disposal, Burns calculated the 2005 net present value of conversion to dry fly ash as $19.5 million, with a 2008 net present value of $24.5 million, for a cost of $368 per electric service customer. However, conversion to dry fly ash would not address the boron generated by the air pollution control systems at issue.

Burns also found that conversion of CWLP's Units 31 and 32 to a dry bottom ash system is not feasible, and that while conversion of Dallman Unit 33 is technically feasible, due to space limitations, lack of industry experience and negative cost-benefit ratio, converting Dallman Unit 33 is not favored.

CWLP also considered treatment options for the removal of boron from FGDS wastewater, which contains high concentrations of dissolved and suspended solids, such that less-expensive removal options that might otherwise be typical, would be ineffective in this case, but could nevertheless range from $6.1 million to $9.2 million for capital costs and from $0.80 million per year to $14 million per year in annual operating and maintenance costs, such that the present value of the treatment alternatives range from $22 million to $254 million.

CWLP evaluated use of a brine concentrator ("BC") followed by a spray dryer. Such technology is comprised of mechanical evaporators that separate and recover water from the wastewater solution. The most commonly used BCs use a vapor compressor to

provide a self-sufficient supply of steam to heat up the wastewater slurry. The heated wastewater evaporates and generates steam that is compressed and used for reheating the wastewater slurry, which is then recirculated in a vertically mounted tube bundle. Due to high concentrations of total dissolved solids ("TDS") and chlorides, the materials that come in contact with these higher concentrates are normally made from high-grade stainless steels and the tubes from titanium, and are very expensive. In addition, the vapor compressor and the slurry recirculation pumps consume a significant amount of electricity. The concentrated bleed would then be fed into a spray dryer, where it would be completely dried to a solid form for disposal, in a chamber where hot air containing combusted natural gas would be injected, leaving behind the solids.

Burns concluded that to accommodate periodic maintenance, and possible variation in the incoming wastewater flow rate, dual trains of the BC/spray dryer units would be needed, each designed for 50 percent of the maximum capacity required. Burns initially opined that boron removal using dual train BC/dual train spray dryers had a capital cost of $8,222,000 and an annual operating cost of $798,539.

CWLP also considered reverse osmosis ("RO") followed by crystallizer and a spray dryer. The RO process was considered as an alternative to the first stage treatment, with mechanical evaporation to concentrate the wastewater. In this case, however, due to the high concentrations of dissolved constituents in the FGDS blowdown stream, high recovery is impossible due to the osmotic pressure and the pressure limitation of commercially available RO membranes. Burns concluded that, because of the constituents in this FGDS blowdown, including high suspended solids, pretreatment would be necessary before the wastewater could be treated by an RO system.

To address the problems caused by these constituents, it was determined, for example, that when concentrated in the RO system at neutral or acid pH, silica concentrations may exceed its solubility and cause a scaling problem on the RO membranes, and that boron may crystallize to form boric acid, a waxy substance that could also foul up the RO membranes. Thus, following the lime soda softener, Burns considered a HERO system (a patented high efficiency RO system design). But, HERO is still an RO system, so its recovery is limited by the osmotic pressure.

Due to the limitation of the recovery of the HERO, the size of the crystallizer is much larger and more expensive than the spray dryer included after the BC. However, the cost of the HERO is generally less than that of a BC and consumes less electricity, but also has some disadvantages. The BC option is more favorable than the HERO because it involves fewer components to operate. Also, the chemical consumption as well as solids removal (requiring disposal) of the lime/soda softener is significant. Finally, the energy consumption of the crystallizer is much higher than that of the spray dryer. Burns opined that boron removal in FGDS water using a lime/soda softener followed by dual train HERO systems had a capital cost of $6,120,000 and an annual operating cost of $1,118,649. These values represent 2005 dollars.

In December 2005, based upon Burns' recommendation, CWLP entered into a contract with Aquatech to provide a Zero Liquid Discharge ("ZLD") plant for the treatment of FGDS wastewater, consisting of two BCs followed by spray dryers, to treat the blowdown from the FGDS system at CWLP's plant. The process energy would be developed by four vapor compressors that would consume 550 horsepower each. The concentrated saltwater would be sent to a gas-fired spray dryer that would convert the

solution into a powdered salt. The solid salt would not be included with the Aquatech system, but instead would be taken to a landfill. Ninety percent of the evaporated water would be condensed and could be recycled in various plant processes.

In February 2006, while CWLP and Burns began working with Aquatech on the engineering, it was discovered that the Aquatech system would have to be supplemented with a pretreatment system to remove suspended solids from the system, to prevent scale from forming in the evaporators and preheaters. This led to the design of a pretreatment clarifier system to remove the suspended solids, expected to consist mainly of a clarifier and sand filter tanks. The pretreatment system would be used to separate the solids and return them to the scrubber for reuse. At that point in the project, CWLP retained Crawford, Murphy & Tilly, Inc. ("CMT") for the pretreatment system.

In April 2006, after months of evaluation, the system had grown to the extent that the annual natural gas costs would be a considerable expense, and it was difficult to find a feasible location for the boron removal plant.

In September 2006, as the engineering progressed, it became apparent that the use of a BC/spray dryer system to treat the FGDS blowdown was a unique application of this technology, such that the relative inexperience in this application translated into design changes as engineering of the system progressed. Burns and Aquatech encountered issues that required significant changes in the project on a fairly regular basis, because the technology was unproven, and a BC had not been used to treat an FGDS wastewater stream. There was relatively little expertise in this area, such that the design changed as it was engineered, and the project was considered a pilot project. For example, the equipment, typically used for cooling tower blowdown treatment in combustion turbine

power plant applications, was a much different application due to the heavier dissolved solids loading present in the FGDS wastewater stream.

CWLP initially investigated processing one to two bags an hour to dispose of the waste byproduct material out of the spray dryer, but soon learned that the material densities were such that the number of bags to unload increased to 20 bags every 10 minutes. CWLP then considered a conveyor and truck trailer removal arrangement, requiring excessive costs in trucking and landfill fees, due to the increase in volume of the waste byproduct. Moreover, the byproduct would be considered a special waste according to chemical analysis of the projected waste byproduct. The byproduct was also hydroscopic, meaning it would quickly soak up moisture in an open environment, turning into a sticky, mud-like substance, posing yet additional issues with trucks and landfills, that had not yet been addressed.

Additionally, the original scope of work and the associated cost increased several times, and became too high to proceed with the proposed BC system. At the time the system was abandoned, the capital cost had risen to $40 million and the annual operating and maintenance cost had risen to $3.7 million. It was realized that the original Burns report had significantly underestimated the capital and operating costs of the BC option, by as much as 4 to 5 times. How to dispose of the solid waste generated by the treatment system was never resolved.

During the design of the pretreatment system, CMT was informed of the problems surrounding the BC option. In September 2006, CWLP decided to pursue alternate options because of the dramatic cost increases and the design and operating issues encountered. CWLP asked Burns to conduct a study on using evaporation ponds in

conjunction with the BC option, or without them. The study indicated that it was not feasible to use this method without forced evaporation methods, which would be too costly in conjunction with the costs to build the ponds. In December 2006, CMT provided CWLP with a preliminary study on using the SMSD Spring Creek Plant as an alternate option.

In response to a request from the Illinois Environmental Protection Agency in the spring of 2007, CWLP evaluated boron removal using electrocoagulation ("EC"), a method of treating wastewater with electricity to cause contaminants to become destabilized and precipitate, consisting of metallic electrode plates separately by thin annular spaces, which dissolves the electrodes. The dissolved metal ions react with contaminants creating precipitates that are removed by filtration. Metal plates of aluminum are the most effective for boron removal.

Contaminant reduction occurs via flocculation/precipitation and adsorption. Adsorption occurs when contaminants electrostatically adhere to the flocculated solids and are removed along with the precipitates. But adsorption of boron on aluminum flocculants has been reported to be only 20 percent of available boron, when adsorption is not inhibited by other contaminants such as chlorides and sulfates, both of which exist in the FGDS wastewater in high concentrations.

Targeting boron specifically for removal by EC in the FGDS wastewater is difficult because boron is known to exist in at least six pH dependent species in water, such that 50 to 60 percent of the boron will be in the boric acid form, which is difficult to remove by most available technologies. Further, competing reactions from other FGDS wastewater constituents may dramatically lower boron removal.

Burns was hired by CWLP to produce a letter of recommendation on the EC option. CWLP supported the efforts with a small scale test on-site with a local supplier of EC equipment. Burns opined that removal of boron in FGDS wastewater would require a capital cost of $9,207,000 and annual operating costs of $14,074,000, concluding that economically, EC is not recommended for FGDS wastewater due to high capital and operating costs relative to low boron removal efficiencies, based on assumptions extrapolated from studies performed on wastewater much different from the FGDS wastewater. Here, boron removal efficiency cannot be predicted due to lack of verified boron removal efficiencies in high boron and high TDS wastewater, such that boron removal efficiency is expected to be dramatically decreased from theoretical estimates due to competing reactions in the EC process. The on-site tests were stopped by the supplier due to his equipment being damaged by the aggressiveness of the FGDS wastewater. The tests were unable to show any reliability of boron removal.

CWLP also evaluated the use of western coal in place of Illinois coal. In Burns' *Phase II SO_2 Compliance Study Report*, dated October 1998, switching the CWLP coal supply from Illinois coal to Power River Basin ("PRB") coal was evaluated. PRB coal, mined in the western United States, is low-sulfur, low-boron coal, as compared to coal mined in Illinois. Because CWLP does not have any reliable way to receive rail-delivered coal to the plant, and the plant site is not large enough for unit train coal deliveries, major modifications would be required to enable limited rail unloading of PRB coals. Two alternatives to on-site rail delivery were identified by CWLP during this study, both involved unloading the trains at an off-site facility and trucking the coal to the CWLP plant.

Modifications would include retrofitting existing hammer mills to accommodate the finer grade PRB coal, and installation of dust control systems, including enclosures of truck dump operations to reduce dust emissions during unloading operations. Test burns revealed that installation of a limestone storage silo and feed system would also be needed. Burns also identified 13 areas of concern for operation of existing equipment and systems to burn PRB coal, including, for example, the capacity of the forced draft and the induced draft fans, the coal feeder, the bowl mill and the exhauster, potential cyclone modifications and addition of cyclone slag flux agents, as well as modifications to the ash handling systems. Burns also noted that certain factors associated with PRB coal combustion, such as increased gas flow, ash particle size and fly ash/bottom ash split have influence on precipitator performance, such that it may make it impossible for CWLP to achieve continuous air compliance under all operating conditions burning PRB coal in the existing plant.

After considering the *Phase II SO_2 Compliance Study Report*, CWLP decided to add a FGDS to Dallman Units 31 and 32. Factors cited by CWLP in support of this decision include: 1) lowest cost long-term solution; 2) economic benefits for Springfield and the State of Illinois, such as burning Illinois coal, creating 100 coal mine related jobs, creating over $10 million in annual coal sales, and creating 200 to 250 construction related jobs; 3) CWLP has successfully operated and maintained a FGDS on Unit 33 for 19 years; 4) gypsum byproduct sales would be $3,000,000 per year; and 5) the State of Illinois had budgeted $12.5 million in Cost Sharing Funds to benefit Illinois jobs.

Further, CWLP cited the following disadvantages of using PRB coal: 1) over $10 million leaving Illinois annually; 2) shipping delays; 3) major railway modifications; 5) boiler modifications; and 6) concerns about explosive dust.

CWLP's decision to continue to burn Illinois coal is atypical of the utility industry. Although Illinois has an abundance of bituminous coal, only 13.5 percent, or 7.5 million tons, of the coal used by Illinois utilities and industrial users in 2005 was mined in Illinois, according to the Office of Coal Development.

SMSD has contracted with CWLP to accept the FGDS wastewater stream, at a cost to CWLP of $100,000 per month, provided that its acceptance does not upset normal plant operations. CWLP intends to treat the FGDS waste stream with conventional pretreatment processes for solids removal prior to pumping the wastewater to SMSD's Spring Creek Plant. While laboratory jar tests have shown in some instances that a small percentage of the boron in the wastewater can be removed with solids settling, the jar test results have not been consistent; thus, CWLP is not claiming any boron removal by this treatment for purposes of calculating boron concentrations in this proceeding.

CWLP proposes collecting the FGDS waste stream in a 250,000 gallon influent holding tank. This tank will provide about 22 hours of holding time for the wastewater stream, anticipated to be approximately 187 gallons per minute ("gpm"). Wastewater collected in the influent holding tank will be fed to a ClariCone™ solids contact clarifier with a 240 gpm capacity.

Operation of the patented ClariCone™ has been demonstrated at over 300 installations nationwide. Mixing, tapered flocculation and sedimentation all take place within a completely hydraulically driven vessel. The ClariCone™ maintains a dense,

suspended, rotating slurry blanket that provides solids contact, accelerated floc formation and solids capture. The conically shaped concentrator maximizes the slurry discharge concentration and allows plant personnel to visually monitor slurry discharge. The large mass of retained slurry and unique helical flow pattern in the ClariCone™ prevent short-circuiting and resists process upsets.

As part of this project, a pumping station would be constructed near the Scrubber Building at the CWLP plant. All sump and pump materials will be corrosion resistant. A forcemain would be constructed from the pumping station to a sanitary sewer in the Spring Creek Plant sub-area, generally southwest of Bergen Park in Springfield. Standard sewer forcemain construction will be used.

It is anticipated that up to four air release valves will be required. Sealed and lined vaults will be used to minimize odors and corrosion. Lining of the receiving manhole and sewer is anticipated. CWLP will install, operate and maintain one or more chemical feed sites or stations as deemed necessary by SMSD to control odors and corrosion.

The pumping of the FGDS wastewater stream to SMSD's Spring Creek Plant will have a capital cost significantly lower than options investigated by CWLP. The estimated capital cost of the pretreatment system, including the pipeline to transfer the pretreated FGDS wastewater and chemical feed system(s) to control odor to the plant, is $15.5 million. The annual operating and maintenance ("O & M") cost of such treatment, which is estimated to be $1.6 million, is also anticipated to be significantly less than the other treatment options. While some costs may remain fixed, other O & M costs will likely escalate. Using a $10,000 per year escalation factor, a pretreatment life of 30

years, and an interest rate of 8 percent, this equates to a present value of $36,100,000, a present value per electric service of $544. In addition, the pumping station will occupy significantly less space than other alternative technologies and no special or hazardous waste would be generated.

The construction of the ClariCone™ and pumping station is currently in progress with an estimated completion date of March 2009. The engineering design of the SMSD forcemain is currently being performed by CMT and is estimated to be complete in December 2008. Construction is estimated to start in April 2009 and end by August 2009. The bidding and construction schedule is dependent upon approval of this petition for the site specific rule. The City of Springfield's City Council will not authorize bidding or award for construction without Board approval here.

Currently, a new 238 MW coal fired generating station is being constructed, commonly known as Dallman Unit 4. The project is 87 percent complete. It is estimated that the unit will fire on coal for the first time around the summer of 2009. Our designs have always included the Dallman Unit 4 FGDS blowdown quantity. Kiewit Black & Veatch of Springfield have estimated the flow of the Dallman Unit 4 FGDS blowdown to be 70 gpm as a maximum and 36 gpm as a daily average.

I will be happy to answer any questions. Thank you.

Respectfully submitted,

CITY OF SPRINGFIELD, ILLINOIS,
OFFICE OF PUBLIC UTILITIES,
CITY WATER, LIGHT AND POWER

and

SPRINGFIELD METRO SANITARY DISTRICT,

Date: October 20, 2008

By: /s/ Christine G. Zeman
One of Their Attorneys

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CWLP:002/Fil/Pre-Filed Testimony of D. Brown

DOUGLAS A. BROWN, P.E.

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PROFESSIONAL QUALIFICATIONS

Accomplished engineer with significant experience within the power generation industry. Proven leadership capabilities coordinating and managing multiple engineering projects within critical time constraints. Experienced supervisor of union and non-union personnel.

Core competencies include:

Dynamic Leadership • Outstanding Productivity • Budgeting • Multi-tasking • Planning
Critical Decision Making • Performance Driven • Problem Solving • Supervision

PROFESSIONAL EXPERIENCE

City Water, Light, and Power **1994-2008**
Dallman Power Station, 3100 Stevenson Drive, Springfield, IL 62703

2008-Present
Project Manager for the 238MW coal fired Dallman 4 Generating Facility and Boron Mitigation Projects worth $450 million and $16 million respectivley.

Key Achievements
- Promoted to Projects Director in 2008.
- Supervision of 14 employees and 4 full time on-site consulting engineers.

2004-2008
Responsible for the Boron Mitigation, Coal Handling Improvements, Site Improvements, Security Upgrades, and Unit 33 Chimney Upgrade projects along with various maintenance projects including boiler repairs and various miscellaneous system improvements with an average annual expenditure of $12 million.

Key Achievements
- Promoted to Superintendent of the Projects and Construction Department in 2004.
- Supervision of 10 employees.

2001-2004
Project Engineer for the $80 million Dallman Units 31, 32, and 33 Selective Catalytic Reduction (SCR) Project, which greatly reduced nitrous oxides from the plant emissions.

Key Achievements
- Elected by peers to the SCR Start-up Committee. This eight-member committee successfully started up three SCRs under a tight schedule while providing training and documentation to plant personnel.
- Assigned to consulting firm's construction management team as the lead electrical engineer.

2001-2002
Project Manager for the Water Plant Backup Power Source Project. Responsible for $2.6 million budget, design, procurement, and construction of three diesel generators that supply the City of Springfield's Water Plant with emergency electrical power.

Key Achievements
- Developed and executed strategic testing plan of all critical systems.
- Successfully completed project under budget by $200,000.

1999-2001
Project Engineer for the $34 million Dallman Units 31 & 32 Flue Gas Desulfurization System that lowered the sulfur dioxides from the plant emissions.

Key Achievements

- Commissioned $2.1 million worth of new electrical equipment.
- Directed electrical construction efforts worth $3.5 million.
- Promoted from Engineer II to Engineer III in 2000.

1997-1999

Performed as the Maintenance Relief Supervisor for the Electrical Maintenance Department for eight-month period.
Project Manager for the new plant wide Continued Emissions Monitoring System (CEMS) and the Dallman Unit 33 Excitation System Upgrade.
Project Engineer for the Dallman Units 31, 32, & 33 Controls and Protective Relaying, Unit 33 Coal Feeders, and Unit 33 Turbine Controls upgrades.

Key Achievements

- Implemented new system for Plant wide CEMS in vital time frame for year 2000 compliance.
- Developed the Engineering Department's five-year budget plan in fiscal year 1999.
- Promoted from Engineer I to Engineer II in 1997.

1994-1996

Project Engineer for the controls projects of the Dallman Unit 33 Flue Gas Desulfurization System, Units 31 & 32 Burner Management System (BMS), and Units 31, 32, & 33 Ash Handling Systems upgrades.

Key Achievements

- Effectively completed the BMS project within critical time constraints.
- Successfully completed Ash Handling project on schedule and within the budget of $300,000.

All projects required administrative responsibility of preparing contract documents, specifications, and drawings for the procurement of material, services, and construction. Contract negotiations were also a crucial element of each project. The projects required supervising consulting firm engineers, contractors, and plant personnel, while coordinating and scheduling activities between contractors and all plant departments.

Computer related skills include: Microsoft Word, Excel, Access, Power Point, Project, and AutoCad.

EDUCATION AND CREDINTIALS

University of Illinois at Urbana-Champaign • B.S. in Electrical Engineering, May 1994
Interests: Electric Machines, Electrical Power Systems, and Controls.

Lincoln Land Community College, Springfield, IL • A.A.S in Pre-Engineering, May 1992

Professional Engineer (P.E.): State of Illinois, License Number: 062-053734

ACTIVITIES

1994-2008
Institute of Electrical and Electronics Engineers (IEEE): member
National and Illinois Society of Professional Engineers: member

1994
University of Illinois Design Team
Team leader and team spokesperson in a design project for the 1994 IEEE PES T&D Conference and Exposition in which we received third place out of thirty entrees which resulted in a published paper. "*Method to Improve Transmission System Voltage Stability*", (with others), Proceedings of 1994 IEEE/PES T&D Conference, pp. 73-78, April 10-15 Chicago, IL.

I [illegible] Utility Engineer Project Manager for [illegible] projects on the site for improvements for [illegible] (roads and parking lot), Security Upgrades for various CWLP sites, Unit 33 Chimney Improvements worth $2.6mil, Boron Mitigation worth $16mil down from $40mil, others item were maintenance contracting such as scaffolding, industrial cleaning services for the boilers and scrubbers, and boiler repairs.