RECEIVED
CLERK'S OFFICE
DEC 4 2003
STATE OF ILLINOIS
Pollution Control Board

BEFORE THE ILLINOIS POLLUTION CONTROL BOARD

IN THE MATTER OF:

PROPOSED SITE SPECIFIC REGULATION APPLICABLE TO AMEREN ENERGY GENERATING COMPANY, ELGIN, ILLINOIS, AMENDING 35 ILL. ADM. CODE 901	))))	R04-11

NOTICE OF FILING

TO: See attached Service List

Please take notice that today I have filed with the Clerk of the Illinois Pollution Control Board the following documents on behalf of the Petitioner in this matter, in accordance with 35 Ill. Adm. Code 102.424 in anticipation of the hearing in this matter:

1. Pre-Filed Testimony of Richard C. Smith of Ameren Energy Generating Company
2. Pre-Filed Testimony of David J. Parzych of Power Acoustics, Inc.
3. Pre-Filed Testimony of Greg Zak of Noise Solutions by Greg Zak; and the following documents to be submitted as exhibits at hearing.
4. Power Acoustics, Inc.: Compilation of Sound Assessment Studies and Reports, and Resume of David Parzych
5. Noise Solutions by Greg Zak: Sound Assessment Report for Ameren Elgin Facility dated November 1, 2003
6. Resume of Greg Zak

Also filed today is Motion for an Extension of Time directed to the Hearing Officer in this matter, along with a Certificate of Service , a copy of which is attached and hereby served upon you.

Respectfully submitted,

Marili McFawn

Dated: December 3, 2003

Schiff Hardin & Waite
6600 Sears Tower
Chicago, Illinois 60606
312-258-5519

CH2\ 1060935.1

CERTIFICATE OF SERVICE

I, the undersigned, certify that I have served documents described in the attached Motion of Filing, by depositing these documents with Federal Express on December 3, 2003 for service upon the Clerk of the Pollution Control Board and Hearing Officer John Knittle. The remainder of those on the Service List were served by depositing these documents in regular U.S. mail on December 3, 2003.

Marili McFawn

CH2\ 1060957.1

SERVICE LIST

Ms. Dorothy Gunn
Clerk of the Pollution Control Board
James R. Thompson Center
100 West Randolph
Suite 11-500
Chicago, Illinois 60601

Mr. John Knittle, Esq.
Hearing Officer
Illinois Pollution Control Board
1021 North Grand Avenue East
Springfield, Illinois 62794

Office of Legal Services
Illinois Department of Natural Resources
One Natural Resources Way
Springfield, Illinois 62702-1271

Mr. Scott Phillips, Esq.
Illinois Environmental Protection Agency
Division of Legal Counsel
1021 North Grand Avenue East
P.O. Box 19276
Springfield, Illinois 62794-9276

Realen Homes
Attn.: Al Erickson
1628 Colonial Parkway
Inverness, Illinois 60047

Mr. Joel Sternstein
Assistant Attorney General
Environmental Bureau
188 West Randolph St., 20th Floor
Chicago, Illinois 60601

Village of Bartlett
Attn.: Bryan Mraz, Attorney
228 South Main Street
Bartlett, Illinois 60103

CH2\ 1060953.1

RECEIVED
CLERK'S OFFICE
DEC 4 2003
STATE OF ILLINOIS
Pollution Control Board

BEFORE THE ILLINOIS POLLUTION CONTROL BOARD

IN THE MATTER OF:

PROPOSED SITE SPECIFIC REGULATION APPLICABLE TO AMEREN ENERGY GENERATING COMPANY, ELGIN, ILLINOIS, AMENDING 35 ILL. ADM. CODE 901	))))	R04-11

MOTION FOR EXTENTION OF TIME

Petitioner moves the hearing officer in this matter to grant Petitioner an extension of time to file the Pre-Filed Testimony and Exhibits intended to be introduced at the hearing now scheduled in this matter. These documents were served on the Clerk of the Board and those persons on the Service List in this matter on December 3, 2003.

Pursuant to the hearing officer's order in this matter, these documents were to be filed November 26, 2003. That hearing officer order was dated November 17, 2003, but received by Petitioner's counsel on or after November 21, 2003. Until that time, Petitioner's counsel believed that the filing date was set for December 3, 2003, based upon a telephone conversation with the hearing officer on November 13, 2003. Upon receipt of the Hearing Officer's order, counsel informed the Hearing Officer of the difficulty involved in meeting a November 26, 2003 filing date.

Pursuant to Section 102.424 of the Board's Procedural Rules, the Board's hearing officer may extend the date for filing these documents to prevent material prejudice or undue delay. Acceptance of this filing at this time will serve for a more efficient hearing, and will not materially prejudice any participant. Accordingly, Petitioner respectfully request that the Hearing Officer grant this motion as allowed under Section 101.522 and 102.242 of the Board's Procedural Rules.

Respectfully submitted,

Marili McFawn

Marili McFawn

Dated: December 3, 2003

Schiff Hardin & Waite
6600 Sears Tower
Chicago, Illinois 60606
312-258-5519

CH2\ 1060950.1

RECEIVED
CLERK'S OFFICE
DEC 4 2003
STATE OF ILLINOIS
Pollution Control Board

BEFORE THE ILLINOIS POLLUTION CONTROL BOARD

IN THE MATTER OF:

PROPOSED SITE SPECIFIC REGULATION	)	
APPLICABLE TO AMEREN ENERGY	)	R04-11
GENERATING COMPANY, ELGIN, ILLINOIS,	)	
AMENDING 35 ILL. ADM. CODE 901	)	

PRE-FILEDTESTIMONY OF
RICHARD C. SMITH
OF
AMEREN ENERGY GENERATING COMPANY

Good Morning. I am Richard C. Smith. I am the Manager of Generation Services at Ameren Energy Generating Company. I am responsible for project management, engineering, outage planning, safety, training, laboratory services, and operation and maintenance of AEG's combustion turbine fleet as well as two cogeneration facilities. I possess bachelor's and master's degrees in mechanical engineering and am a Fellow of the American Society of Mechanical Engineers. I am a licensed Professional Engineer in the States of Illinois and Missouri.

I was responsible for leading the development of the Ameren Elgin Energy Center project and was responsible for the construction and commissioning of the Facility. In my current position, I am responsible for operation and maintenance.

The Elgin Energy Center site location was selected because of the fact that the property was in an industrial setting that contained appropriate, compatible land uses and access to ComEd's Spaulding Road substation. Natural gas fuel supply would be available through a proposed pipeline being developed by a joint venture between Nicor and Natural Gas Pipeline Company of America. Additionally, access to railroad tracks was in close proximity for transportation and delivery of heavy equipment associated with the combustion turbines.

When the Facility was still in the design phase, Ameren considered the possible noise effect on the surrounding community. For that reason, Ameren worked extensively with the equipment supplier, Siemens Westinghouse, and engaged Mr. Dave Parzych of Power Acoustics, Inc. to survey ambient noise sources at critical nearby receptor locations which included existing residential locations and a commercial operation, and to perform an acoustical model analysis to estimate the noise that may result from operation of the four gas turbine unit facility. Mr. Parzych will testify that a computer noise model of the proposed Elgin facility, after taking into account the proposed noise abatement controls now in place at this Facility, estimated the sound pressure level to be at or below the Board's noise regulations at all then-existing residential receptors. So, even before the Facility was built, Ameren was diligent in its efforts to comply with applicable noise limitations. In addition, a robust public information program was conducted in order to inform local government and residents of Ameren's intentions which included information pertaining to plant design.

Since that time, the character and the nature of the area has changed little. The area is heavily industrial. As you can see on Attachment 2 to our Petition, the Facility is located in an industrial park and is surrounded by industrial uses. To the immediate north is the GE Capital Module Space, an outside storage yard of temporary office trailers. Immediately east of the Facility is a BFI Waste Systems facility. Just further east is Commonwealth Edison's high powered transmission line corridor and an active railroad. Also nearby to the south is the U.S. Can Company, a manufacturing facility. To the immediate west is currently vacant property owned by Realen Homes, which at the time of the Facility's construction was intended for use as a balefill operation by the Solid Waste Agency of Northern Cook County (known as "SWANCC"). Just north of this area is Bluff City Materials, a quarry and mining operation.

At the time the Facility was constructed and still today, the predominant industrial character of the area results in heavy truck traffic and other vehicular traffic on Gifford Road and West Bartlett Road. The quarry and mining operation contributes a great number of dump trucks and heavy equipment trucks. The nature of U.S. Can Company's operations contribute many tractor trailer trucks. During the sound surveys conducted by Power Acoustics, Inc. and Noise Solutions by Greg Zak, both monitored significant noise from these operations, as well as from overhead air traffic and train noise.

The nature and character of the area has not changed over the years, and to our knowledge, there have been no complaints about noise from our power generation facility. When we learned that the unincorporated, vacated property across Gifford Road from the facility was proposed for residential development, we engaged Dave Parzych of Power Acoustics, Inc. and shortly thereafter, Noise Solutions by Greg Zak to update our information about noise in the area and that generated by our Facility. Both gentlemen will testify about their investigations and recommendations which are the basis of Ameren's request for the site specific noise limitations proposed in this Petition.

I hope that I have adequately informed you about the industrial nature and character of the area where our Facility is located and the steps we took to construct it to minimize any noise impact on that area. I am also appearing here today to answer questions you may have about our power generation facility in Elgin and other questions relevant to Ameren's operations of this Facility. I will also testify regarding the operation of the Facility, the noise abatement control in place at the Facility, and the potential costs of additional noise abatement control.

The Elgin Energy Center consists of four Siemens Westinghouse W501D5A combustion turbines. Each unit is capable of a rated maximum output of 135MW of electric power generation. At this point, you may want to refer to Attachment C of our Petition filed October 28th. That Attachment is entitled "Simple Cycle Combustion Turbine."

Air, taken in through the inlet filter and silencer, is compressed and combined with natural gas. The air-fuel mixture is combusted and the hot gasses are expanded through a multi-stage turbine to produce shaft rotation/torque. The turbine shaft is directly connected to a generator which is used to generate electric power. Exhaust gasses exit the system through the exhaust silencers and stack.

As described in our Petition, the Facility is equipped with several different kinds of noise abatement systems. The turbine of each unit is enclosed and equipped with enclosure ventilation silencing. Because the majority of the noise emitted comes first from the opening needed to get air into the turbine's compressor, the inlet, and then from the opening needed to get the combustion exhaust gasses out of the turbine, both are equipped with noise abatement controls. The air intake for each turbine is enclosed, and intake is equipped with inlet silencer baffles. This is combined with extensive duct structural stiffening and lagging as secondary noise attenuation to further reduce sound radiating from the air intake system.

The noise abatement equipment at the exhaust outlet is state of the art. The silencer panels were designed specifically for this Facility to attenuate the low frequency 31.5 Hz and 63 Hz octave bands while also providing substantial mid and high frequency noise reduction. They are extra thick and longer than those used as comparable facilities, in fact so long that a special horizontal section of silencer panels approximately 35 feet in length and supported on the ground was used to accommodate the massive exhaust silencer. The traditional 50 foot high vertical exhaust stack was also used to provide an additional 15 feet of silencers. Finally, to keep sound from radiating from the exhaust ducting surfaces, an extra, secondary enclosure system was provided, which is acoustically insulated with ¼ inch or more steel plate. As Mr. Parzych, who was retained by Ameren during the design phase of this Facility to assess potential noise from this Facility, will testify further on the unique control characteristics of the noise control system for the exhaust outlet.

As explained in our Petition, and as I mentioned early, with the help of Power Acoustics, Inc., during the design phase Ameren evaluated the possible impact of noise from the planned facility on the area to determine the necessity and value of equipping the planned facility with noise abatement equipment beyond that standard to the industry. Based on Mr. Parzych's study, Ameren determined that, as planned, the facility could comply with the Board's noise limitations at then existing residential areas. Accordingly, Ameren installed the state of the art exhaust silencing system and all the other noise abatement controls just described. The estimated cost for the noise abatement measures for all four units was a total of $11,650,000.

More recently, Ameren again retained Mr. Parzych to study whether the Facility would be able to comply with the newly proposed residential area just west and across the road from the Elgin Facility. Mr. Parzych will testify that based upon actual measurements in the field, he determined that the Facility does comply with the Board's noise regulations at pre-existing residential areas, but may not be able to comply with the Board's Class A noise limitations at the Realen property despite the extensive sound abatement equipment already in place. For that reason, Ameren investigated the technical feasibility and costs of installing additional noise control equipment at the Facility.

While we investigated several approaches, prior to proceeding with any particular abatement measure, a detailed sound study would be required to determine first the type of noise that must be reduced, and then whether the proposed measure would sufficiently abate the noise to meet the Board noise emission limitation. Sound testing would have to be conducted to determine the octave band sound power levels of each sound source, i.e., the gas turbine, inlet system, exhaust system, generator, transformers, or coolers. Such a study would then have to evaluate the effectiveness of the various sound source treatments, including more inlet system silencing, generator sound treatments beyond the current enclosure, barrier walls, and exhaust sound systems beyond the state of the art system already provided. The estimated cost for such a study is $25,000. This cost estimate does not include the cost of operating the Facility for the purpose of recording noise measurements of the various plant components.

Based upon Mr. Parzych's and our past experience, we have examined the feasibility and the cost of seven additional noise abatement measures. However, before explaining the derivation of the cost estimates provided on the Table of Estimated Costs of Noise Abatement Measures, Attachment E to our Petition, I would like to make some general clarifications. The estimates are order of magnitude in the range of -25% to +75%, which ought to be interpreted that real costs would likely fall within this range around the figures presented in Attachment E to the Petition. Again, to establish a more accurate estimate requires a detailed sound study of the Elgin Facility that I just described. Also, some of the noise abatement measures have not been proven in the power industry and would require extensive research and testing (*e.g.*, a new redesigned stack, or an active noise control system).

The cost estimate for each option is broken down into material, labor, engineering, project management, AFUDC (construction interest), overhead and contingency costs. These are the major cost categories of a typical project and are used to develop cost estimates for Ameren projects. The material costs were obtained from

Dave Parzych based upon his experience with the Ameren facility and other comparable power generation facilities. These estimates are based in part on industry rule of thumb pricing. The labor costs are based on actual Elgin facility installation costs plus uncertainty which is within the order of magnitude range. The engineering, project management, AFUDC, overhead and contingency percentages are based on typical project cost percentages.

I will address in order from right to left each of the seven alternatives listed on Attachment E: Estimated Costs of Noise Abatement Measures. First considered is the installation of additional exhaust stack silencers for low frequency noise reduction (31.5 – 63 Hz). Installing additional exhaust stack silencers will most likely not provide the required low frequency noise reduction. The Facility is already equipped with state of the art control measures for this type of noise. Approximately forty feet of additional exhaust stack with silencers may be required to achieve additional reductions in low frequency noise than that currently provided. Because of the large amount of noise reduction that would be required to comply with the Board's residential standards, the likely success of this type of treatment is small. Even then, the estimated cost is $6,000,000. Also, installation of such equipment would require approval and an ordinance from the City of Elgin, which would be difficult to obtain. The additional stack would impair performance of the units by increasing backpressure on the turbines, which would degrade efficiency and power output, which would then adversely impact economic value of the Facility.

The second approach investigated to reducing low frequency noise reduction, 31.5-63 Hz, was installing a new, redesigned stack: A new stack would require full aerodynamic modeling, *i.e.,* a physical scale model to assure nearly "perfect" system aerodynamics , as well as significant analytical work to insure that the exhaust system would achieve the necessary criteria to reduce low frequency noise beyond that already achieved by the equipment at the Facility. According to Mr. Parzych, there are no gas turbine exhaust stacks currently available in the United States that meets the necessary design criteria. The estimated cost for this R&D approach is $18,000,000. It is our judgment that this option would also degrade unit performance and economic value of the Facility.

The third alternative investigated was the installation of an active noise control system for low frequency noise reduction, again sound in the 31.5 to 63 Hz octave bands. This type of technology has been developed under a NASA contract, but it has not been used in the power industry. Such an active noise control system would be expected to work in conjunction with the existing passive silencing for low frequency noise reductions. Because it would be experimental to the power industry and at our Facility, the engineering team who developed the system under contract for NASA would be have to first evaluate the feasibility of such a system for application to this Facility's exhaust systems. The cost for this approach is estimated at $6,000,000, and we associate a very low probability of success.

For additional reduction of high frequency noise, that is sound within the 1000 to 8000 Hz octave bands, the installation of additional inlet silencers was considered. A relatively short section of inlet silencing may provide noise reduction, only if the inlet system is found to be a significant sound source at the higher frequencies. However, the feasibility of this type of noise reduction and its impact on the Facility's operations would have to be further investigated. The estimated cost is $600,000. Our judgment is that this approach would have little positive effect on the overall sound emissions from the site. Again, this approach would degrade unit performance by increase pressure drop through the inlets and would therefore negatively impact economic value of the Facility.

Also considered for reducing high frequency noise reduction, the same range of 1000 to 8000 Hz, was the installation of an additional ducting enclosure. If the inlet ducting is found to be a significant source at the higher frequencies, a secondary enclosure around the inlet ducting may provide noise reduction. The estimated cost for this approach is $1,200,000. Again, our judgment is that this approach would have little positive effect on the overall sound emissions from the site.For mid frequency noise, that is sound at the 125 to500 Hz range, installing a secondary enclosure around the generator was evaluated. However, to obtain the full effects of such an enclosure, additional silencing may be required in the ventilation ducting. The estimated cost is $1,200,000. Again, our judgment is that this approach would have little positive effect on the overall sound emissions from the site. This approach would be unique to the power industry for this type of Facility, and would require extra engineering to avoid adverse operational impacts upon the existing generator enclosures.

Finally, to reduce further mid and high frequency noise reduction at the 125 to 8000 Hz range, the cost of installing a barrier wall on the west side of each unit was estimated. The costs factors included $35 per square foot, and a wall 35 feet tall and 250 feet long. While installation of a barrier wall may be somewhat effective in reducing the mid to high frequency sound, its potential effectiveness would depend on the results of a detailed measurement and analytical study. The estimated cost is $3,600,000, and such barrier walls would not be useful in reducing emissions of low frequency sound.

This Facility is already equipped with significant noise control equipment—probably more equipment than used at other combustion turbine sites or at any other type of noise source. Since it is already controlled, and in large part beyond the levels normally achieved at peaker power plants, successfully reducing noise further is probably technically infeasible or may achieved subject only to much R&D or through a process of trial and error. The cost estimates may appear high, but the actual costs might be much greater due to the experimental nature of many of the approaches. When compared to the environmental impact of the noise in this area, and the high levels of extraneous and ambient noise levels due to the industrial activities in the area, Ameren believes that the costs are not economically reasonable.

Thank you for the opportunity to testify today, and I would be pleased to answer any questions that the Board or its staff may have after our two expert witnesses have testified.

* * * *

Petitioner, Ameren Energy Generating Company, reserves the right to supplement or modify this pre-filed testimony.

Respectfully submitted,

Ameren Energy Generating Company

By: ______________________

Marili McFawn

Dated: December 3, 2003

Marili McFawn
Schiff Hardin & Waite
6600 Sears Tower
Chicago, Illinois 60606
312-258-5519

CH2\ 1060367.2

RECEIVED
CLERK'S OFFICE
DEC 4 2003
STATE OF ILLINOIS
Pollution Control Board

BEFORE THE ILLINOIS POLLUTION CONTROL BOARD

IN THE MATTER OF:

PROPOSED SITE SPECIFIC REGULATION	)	R04-11
APPLICABLE TO AMEREN ENERGY	)	
GENERATING COMPANY, ELGIN, ILLINOIS,	)	
AMENDING 35 ILL. ADM. CODE 901	)	

PRE-FILED TESTIMONY OF
DAVID J. PARZYCH, P.E., INCE. Bd. Cert.
OF POWER ACOUSTICS, INC.
IN SUPPORT OF
AMEREN SITE SPECIFIC NOISE RULE

Ameren Energy Generating Company ("Ameren"), by and through its attorneys, Schiff Hardin & Waite, and pursuant to 35 Ill. Adm. Code 102.424, submits the following Pre-Filed Testimony of David J. Parzych of Power Acoustics, Inc. for presentation at the hearing scheduled for December 17, 2003 in this matter relating to the request for a site specific sound regulation for the Ameren Elgin Facility located at 1559 Gifford Road in Elgin, Illinois.

TESTIMONY OF DAVID J. PARZYCH, P.E., INCE Bd. Cert.

As principal and founder of Power Acoustics, Inc., my career in acoustics and noise control engineering spans more than 21 years. Early in my career, my acoustical disciplines ranged from nuclear submarines to commuter airplanes. Over the past 11 years, however, my work has been focused on power generation facilities with gas turbines, or combustion turbines as my primary interest. My résumé is included in the exhibit containing my written reports.

My testimony today will explain three noise studies involving the Ameren Elgin Facility: the first done in 2000 and predating the design and construction of the Facility; the second measuring sound pressure levels from the existing Facility at existing residential areas and the Realen property; and the third study to estimate the sound pressure levels at locations at various locations at the Realen property. Ameren also requested that I assess the level of noise control equipment currently at the Facility, and whether additional noise control measures are economically or technically feasible to achieve compliance with existing residential noise emission limitations at the Realen property. Finally, I will address how the requested site specific sound limitations for the Ameren Facility were developed using the information collected by myself and Greg Zak of Noise Solutions by Greg Zake in conjunction with our combined expertise in the field of noise and its control.

I have been involved with the acoustics of the Ameren Elgin Facility from the time the Facility was in its conceptual stages in the Fall of the year 2000 through the present. In the project's conceptual stage, Power Acoustics, Inc. undertook the task of estimating the impact of operating four simple cycle Siemens-Westinghouse 501D5A gas turbines at the Ameren Elgin site. A Power Acoustics, Inc. report, "*Acoustical Evaluation and Ambient Sound Survey of the Ameren Simple Cycle Power Facility Proposed to be Built in Elgin, Illinois*", was generated in November 2000 summarizing the results of the study. My tasks at the conceptual stage included measuring the ambient sound at nearby existing residential and commercial areas and estimating the sound produced by the proposed Ameren Elgin Facility. The impact analysis showed the proposed Ameren Elgin Facility, containing state-of-the-art noise control features, would achieve the Illinois State Noise Regulations for the zoning and property uses that existed at that time.

My most recent work relating to this Facility started in June of 2003 and continues through the development of a new site-specific noise emission limitation for the Ameren Elgin Facility. Initially, Ameren requested that I measure the sound with the Facility operational and determine if the Facility met the noise requirements at the nearby residential areas as projected in the initial analysis performed in the fall of 2000. Ameren also requested that I measure the sound pressure levels across the street on the western side of Gifford Road to determine the impact of the Facility on what may become a new residential development. The sound tests were accomplished with only a single gas turbine unit in operation – the one closest to Gifford Road. Subsequently, analytical techniques were used to simulate the effects of the three other units. A Power Acoustics, Inc. report dated June 20th 2003, "*Analysis and Results of Acoustical Measurements Taken Near the Ameren Elgin, Illinois Power Facility During the Operation of the Unit 4 SW501D5A Gas Turbine*", summarizes the results.

The single unit operation was necessary to minimize the cost of the operational testing and reduce the impact to the power grid since the power generated with all units operating would exceed 450 MW. Unfortunately, it is difficult to even give away power in the middle of the night with the moderate weather conditions that prevail at the time of year Ameren needed to do the testing. The results of the study after correcting for four unit operation showed that the Illinois Noise Regulations were achieved at the existing residential areas. However, at the location adjacent to the Ameren Elgin Facility on the west side of Gifford Road, the corrected results indicated that the Facility would likely be in excess of the Illinois Octave Band Noise Regulations if the property is used for residential purposes.

An additional study was performed by Power Acoustics, Inc. in July 2003 to estimate the sound pressure levels at locations enveloping the Realen property. To accomplish this, the sound *power* level of an individual gas turbine unit was estimated from the June 2003 sound *pressure* level measurements. Sound *power* levels are different than sound *pressure* levels in that they are not impacted by sound propagation effects. Sound power is the measure of sound energy that is available to be radiated by the equipment. It can be thought of similarly to the wattage rating of a light bulb. The bulb wattage crudely defines the amount of light it can provide. Although the actual amount of the light produced by the bulb will ultimately depend on a variety of factors, for example, its efficiency, whether it has a lamp shade on it, and/or the color of the room it is in.

Operational sound pressure levels from four unit operation were then estimated at various locations on the Realen property using a theoretical sound propagation method that utilizes the *sound power* information. The results of that study were summarized in a letter to Bill Morse of Ameren on July 11th 2003, which is included in the exhibit containing my three written reports. Basically, on the Realen property, the highest sound pressure levels were estimated to occur directly west of the Ameren Elgin Facility at the closest position to the gas turbine equipment, while sound pressure levels decreased as distance from the Facility increased to the west, north or south.

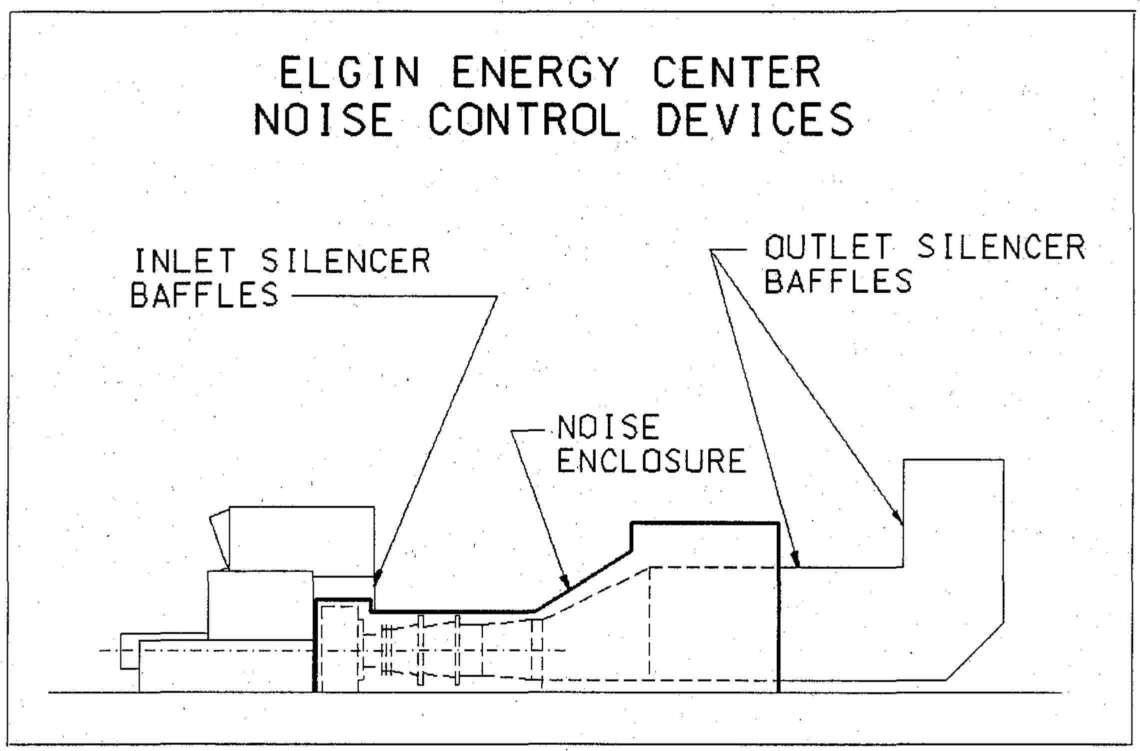
Ameren further asked if any additional noise control could be added to the Facility to enable it to achieve the residential noise levels. I concluded that generalizations could be made for known noise controls such as barrier walls and/or buildings that could further reduce the sound from the Facility. The monetary cost of these treatments, however, would likely be high since the Facility was initially designed to be fully outdoors. Also, the acoustical benefits of the treatments, if any, could not be accurately estimated without performing a detailed design study. Finally, for a facility such as this that already has substantial noise abatement built-in, estimating the effectiveness of additional noise treatments is difficult even with results from a design study.

The 501D5A gas turbines and supporting equipment found at the Ameren Elgin Facility contain the largest amount of sound abatement I have ever seen supplied by Siemens-Westinghouse for simple cycle 501D5A gas turbines. Noise enclosures and ventilation silencers are used extensively to control the sound radiated by the gas turbines and supporting power generation equipment. When the units are "buttoned up" with enclosures and enclosure ventilation silencing, the majority of the noise emitted by a gas turbine is generally observed from two places: first, at the opening needed to get air into the gas turbine's compressor, and second at the opening needed to get the combusted gases out of the gas turbine.

These "holes" located at the gas turbine's intake and exhaust are the most difficult to treat acoustically because they are linked directly to the noisiest internal parts of the engine. Ultimately, a gas turbine operates most efficiently with minimal blocking of its flow path. To accomplish this, the intake and exhaust flow paths are treated with acoustically absorptive parallel baffles that allow flow to pass through the open gaps that exist between the absorptive sound baffles. The silencers can provide a large amount of noise reduction while offering an acceptable pressure loss to the gas turbine.

The exhaust silencing at the Ameren Elgin Facility, particularly that used for low frequency noise control, are state-of-the-art for Siemens-Westinghouse 501D5A units. The silencer panels were dimensionally selected by Siemens-Westinghouse to attenuate the low frequency 31.5 Hz and 63 Hz octave bands while also providing substantial mid and high frequency noise reduction. This required the silencer panels to be extra thick and very long. The low frequency silencer panels were so long that Siemens-Westinghouse had to deviate from its normal practice of placing all the silencing in the vertical exhaust stack. They developed a special horizontal section of silencer panels supported on the ground, approximately 40 feet in length, to accommodate the massive low frequency exhaust silencer. To achieve even more noise reduction, an additional 15 feet of silencers were included in the vertical portion of the exhaust stack. Finally, to keep sound from radiating from the exhaust ducting surfaces, the duct work includes one inch thick steel acoustically insulated with six inches of insulation and an internal steel liner facing the gas flow. A secondary enclosure system was also provided to encase the exhaust ducting. This enclosure consists of acoustically insulated quarter inch thick steel plate. A sketch of the major noise controls is shown in Diagram 1.

Diagram 1 – Elgin Noise Control Features



The exhaust silencer is providing about the maximum attenuation a silencer system of this type can. Adding length to the existing silencing will not likely provide any substantial reduction in sound levels. In the event that more low frequency noise reduction is required, the existing stack would probably have to be removed and a new one designed from scratch. However, even with a completely redesigned exhaust stack, obtaining more low frequency sound attenuation than what currently exists would be questionable since the current design has already challenged the state-of-the-art.

As for the inlet system, substantial inlet silencing and acoustical duct lagging were provided for noise control. The silencer consists of 8 feet of parallel baffles specifically designed to attenuate the high frequency compressor noise. The main inlet ducting consists of an external steel wall that is 3/16 inch thick followed with 4 inches of acoustical insulation and an internal steel liner that faces the air flowing into the compressor. To further reduce the sound radiated by the inlet ducting, a layer of insulation and lightweight gauge steel were added externally to encapsulate the main ducting. The encapsulation is referred to as the "acoustical lagging".

Other prominent sources of sound within the simple cycle gas turbine power generation facility include the air-cooled generator, heat exchangers and transformers. Each of these sources of sound has a common need for air flow to provide cooling. They cannot be completely enclosed. For instance, while the generator resides within a sound enclosure, its air flow cannot have major restrictions without seriously affecting its ability to generate electricity efficiently. The need for air flow is also a requirement with all of the fin-fan type heat exchangers. Placing restrictions around the heat exchangers could cause the equipment they support to overheat and ultimately could cause the facility to fail. Transformers have similar cooling issues. Any additional noise control of these components could have a negative impact on the operational efficiency of the Facility.

Since the monetary and operational cost associated with acoustically modifying the existing Ameren Elgin Facility was prohibitive and its successful outcome questionable, I was asked to help determine obtainable site specific sound pressure level requirements. This task is complicated by the limited amount of available operational data and an endless combination of weather and operational possibilities that can exist. On June 18, 2003, I had obtained sound pressure level data with a single unit operating at base load. This data was analytically corrected to four unit operation. Noise Solutions by Greg Zak had obtained sound pressure level data with all four units in base load operation on September 2, 2003. Both sets of data were taken under weather conditions favorable to sound propagation in the westerly direction. Despite this, the data obtained may or may not be representative of worst case conditions, or conditions where the equipment produces its maximum sound level. For instance, aerodynamic sound sources, such as fans and compressors that operate at constant rotational speeds can produce more noise when the ambient temperatures are cooler and the speed of sound is low. Under cooler conditions the air is also denser so a larger mass of air can be drawn into the gas turbine. Also sound propagation effects, such as atmospheric attenuation, are dependent on various combinations of air temperature and humidity. For these reasons, and many more, two sets of sound pressure level data cannot be considered a statistical representation of the sound from the Facility. Could there be occasions under unknown weather and operational conditions when the Facility was noisier than that measured? Yes. But, without several months of continuous operational data to define the upper envelope of the Facility's sound spectrum, the maximum cannot be easily obtained. However, collecting that amount and type of data is not feasible given that these types of facilities do not operate continuously or at fixed operating levels and the cost of operating them for just acoustical testing is excessive. Even if that task was undertaken, there is no way to duplicate the endless weather conditions and operating levels to collect a statistically valid data base.

To determine the site specific sound pressure level requirements, a combination of the sound pressure level data measured by Greg Zak and myself was used. Also factored in was information supplied by Siemens-Westinghouse in 2000 that defines the equipment sound power levels. The manufacturer's sound power level data is a useful tool since it was assumed that Siemens-Westinghouse would attempt to provide the upper envelope of the sound energy produced by their equipment. This data also removes the unknown sound propagation effects related to the weather and ground composition/cover.

Shown in PAI Table 1 are comparisons of sound power level data provided by Siemens-Westinghouse and sound power levels estimated from June 2003 measurements made by Power Acoustics, Inc. I have included a small version of that and Table 2 for your convenience. A full size version is also attached.

PAI Table 1 – 501D5A Sound Power Level Comparison

Description	Octave Band Center Frequency, Hz								
	31.5	63	125	250	500	1000	2000	4000	8000
Manufacuterers estimate of Sound Power Level of single 501D5A gas turbine and balance of pla	127.3	120.7	119.6	111.2	105.1	100.9	97.6	98.2	99.6
Sound Power Level estimated from PAI June 2003 measurements (July 11, 2003 report)	125.7	119.0	114.4	106.3	103.8	104.5	103.4	99.2	94.5
Delta from Sound Power Level from PAI Measurements and Siemens Westinghouse Data	1.6	1.7	5.2	5.0	1.3	-3.6	-5.8	-1.0	5.1

The differences between the Siemens-Westinghouse data and the Power Acoustics data are evident. However, it does not appear that the Siemens-Westinghouse data is necessarily the upper envelope as was initially expected.

Shown in PAI Table 2 are comparisons of the range of sound pressure levels that were found to exist under conditions measured and with the Siemens-Westinghouse data factored in.

PAI Table 2 - Sound Pressure Levels Found/Estimated On West Side of Gifford Road.

Description	Octave Band Center Frequency, Hz								
	31.5	63	125	250	500	1000	2000	4000	8000
Sound Pressure Level of 4 units (estimated July 11, 2003 PAI report)	77.5	70.8	64.8	53.7	51.8	54.2	52.5	45.1	28.8
Sound Pressure Level of 4 units Corrected for Delta from Siemens Westinghouse Data	79.1	72.5	70.0	58.7	53.1	50.6	46.7	44.1	33.9
Greg Zak Measurements Sept 2003	73.0	66.0	62.0	56.0	51.0	53.0	56.0	49.2	42.4
Average of Greg Zak Measurements, PAI Extrapolation and PAI Extrap w/S-W sound power c	76.5	69.8	65.6	56.1	52.0	52.6	51.7	46.1	35.0
STD Deviation (POPULATION)	2.6	2.8	3.3	2.0	0.9	1.5	3.9	2.2	5.6
Average Plus STD Dev	79.1	72.5	68.9	58.2	52.9	54.1	55.6	48.3	40.7
Proposed Site Specific Rule	80.0	74.0	69.0	64.0	58.0	58.0	58.0	50.0	40.0
Daytime Regulation values shown with " * ", while values with "X" exceed daytime standard	X	*	*	*	*	X	X	X	*

Note: Zak data 4000 and 8000 Hz band was discounted because of contamination by insect noise leading to large STD Dev.

As we developed the proposed site specific limits, we tried to stay within the existing Illinois Daytime Noise standard. However, in the 31.5 Hz, 1000 Hz, 2000 Hz and 4000 Hz octave bands, the Daytime standards did not adequately allow for the sound produced by these units. The levels proposed represent the maximum of either the Illinois Daytime Standard or the average of the measured/synthesized values plus one standard deviation and a safety factor as deemed necessary. The safety factor allows for unknowns caused by instrumentation (measurement) uncertainty, uncertainty associated with the operational parameters of the gas turbine equipment, weather conditions and directivity effects associated with various pieces of the power plant equipment. In my experience, uncertainties of 3-5 dB are not uncommon. In fact, many of the existing national and international noise standards state that measurement uncertainty alone is±3 dB. My opinion is that the uncertainty could be even larger than what we have allowed for given the minimal amount of sound data available from this Facility. This analysis served as the basis for the final requested site specific sound regulation for the Ameren Elgin Facility.

This concludes my testimony summarizing my study and assessment of the Ameren Elgin Facility noise levels, sound abatement and the explanation of the site specific sound levels proposed to the Board for adoption. Thank you for the opportunity to testify today, and I would be pleased to answer any questions that the Board may have at this time.

* * * * *

Petitioner, Ameren Energy Generating Company, reserves the right to supplement or modify this pre-filed testimony.

Respectfully submitted,

Ameren Energy Generating Company,
Petitioner,

By: ____________________
One of its Attorneys

Dated: December 3, 2003

Marili McFawn
Schiff Hardin & Waite
6600 Sears Tower
Chicago, Illinois 60606
312-258-5519

CH2\ 1060049.1

Table 1. 501D5A Sound Power Level Comparison

Description	31.5	63	125	250	500	1000	2000	4000	8000
	Octave Band Center Frequency, Hz								
Manufacuterers estimate of Sound Power Level of single 501D5A gas turbine and balance of plant equipment	127.3	120.7	119.6	111.2	105.1	100.9	97.6	98.2	99.6
Sound Power Level estimated from PAI June 2003 measurements (July 11, 2003 report)	125.7	119.0	114.4	106.3	103.8	104.5	103.4	99.2	94.5
Delta from Sound Power Level from PAI Measurements and Siemens Westinghouse Data	1.6	1.7	5.2	5.0	1.3	-3.6	-5.8	-1.0	5.1

Table 2. Sound Pressure Levels Estimated at Gifford Road Location

Description	31.5	63	125	250	500	1000	2000	4000	8000
	Octave Band Center Frequency, Hz								
Sound Pressure Level of 4 units (estimated July 11, 2003 PAI report)	77.5	70.8	64.8	53.7	51.8	54.2	52.5	45.1	28.8
Sound Pressure Level of 4 units Corrected for Delta from Siemens Westinghouse Data	79.1	72.5	70.0	58.7	53.1	50.6	46.7	44.1	33.9
Greg Zak Measurements Sept 2003	73.0	66.0	62.0	56.0	51.0	53.0	56.0	49.2	42.4
Average of Greg Zak Measurements, PAI Extrapolation and PAI Extrap w/S-W sound power corrections	**76.5**	**69.8**	**65.6**	**56.1**	**52.0**	**52.6**	**51.7**	**46.1**	**35.0**
STD Deviation (POPULATION)	2.6	2.8	3.3	2.0	0.9	1.5	3.9	2.2	5.6
Average Plus STD Dev	**79.1**	**72.5**	**68.9**	**58.2**	**52.9**	**54.1**	**55.6**	**48.3**	**40.7**
Proposed Site Specific Rule	**80.0**	**74.0**	**69.0**	**64.0**	**58.0**	**58.0**	**58.0**	**50.0**	**40.0**
Daytime Regulation values shown with " * ", while values with "X" exceed daytime standard	X	*	*	*	*	X	X	X	*

Note: Zak data 4000 and 8000 Hz band was discounted because of contamination by insect noise leading to large STD Dev.

RECEIVED
CLERK'S OFFICE
DEC 4 2003
STATE OF ILLINOIS
Pollution Control Board

BEFORE THE ILLINOIS POLLUTION CONTROL BOARD

IN THE MATTER OF:

PROPOSED SITE SPECIFIC REGULATION APPLICABLE TO AMEREN ENERGY GENERATING COMPANY, ELGIN, ILLINOIS, AMENDING 35 ILL. ADM. CODE 901	))))	R04-11

PRE-FILED TESTIMONY OF GREG ZAK,
of NOISE SOLUTIONS BY GREG ZAK
IN SUPPORT OF
AMEREN SITE SPECIFIC RULE

Ameren Energy Generating Company ("Ameren"), by and through its attorneys, Schiff Hardin & Waite, and pursuant to 35 Ill. Adm. Code 102.424, submits the following Pre-Filed Testimony of Greg Zak for presentation at the December 17, 2003 hearing scheduled in the above-referenced matter.

TESTIMONY OF GREG ZAK

Ladies and gentlemen, my name is Greg Zak. I am the owner of Noise Solutions by Greg Zak. I am appearing here today on behalf of the Petitioner, Ameren, in support of its proposal for a site specific rule for the noise levels applicable to its Elgin Facility. I will testify regarding the sound measurements taken by Noise Solutions by Greg Zak on September 2, 2003, and the information developed based upon those measurements. I will also explain how those measurements compare to the measurements taken and developed by Power Acoustics Inc., and how the site specific limitations proposed by Ameren compare to the Illinois Pollution Control Board's generally applicable noise emission limitations.

I would like to begin by briefly describing my experience in both the public and private sectors. I have owned and operated Noise Solutions by Greg Zak since March of 2001. Prior to entering the private sector, I was employed by the Illinois EPA. I have over 31 years of experience dealing with noise measurement, noise control engineering, and the effects of noise on people and communities. This experience includes industrial, commercial, residential, urban, rural and construction noise. Many of you know me. I have acted as a noise expert for my firm in enforcement hearings before the Illinois Pollution Control Board. When employed by the Illinois EPA, I was a recognized noise expert in enforcement and regulatory hearings before the Illinois Pollution Control Board, Federal Bankruptcy Court, and in several Illinois Circuit Court hearings related to noise zoning and nuisance. I have been a member of a Society of Automotive Engineering Committee, and a member of the American National Standards Institute Working Group on the Measurement and Evaluation of Outdoor Community Noise. I was selected by Governor Edgar to sit on the Blasting Task Force mandated by House Joint Resolution 133 and chaired by the Illinois Department of Natural Resources. I represented the Illinois EPA, as its Noise Expert, when testifying before the Illinois Pollution Control Board's hearings on August 23, 2000 and October 5, 2000 in the matter of: "Natural Gas Fired, Peak-Load Power Generating Facilities (Peaker Plants)", PCB R01-10. I have also frequently testified at noise enforcement hearings before the Board regarding noncompliance and appropriate remedy. The noise issues I have dealt with frequently involved the technical practicability and economic reasonableness of reducing or eliminating the noise emissions from the source.

As a national and international author in the area of environmental noise, I have presented papers on controlling noise at national and international noise conferences. I am currently a member of the working group for the American National Standards Institute's American National Standard for "Quantities and Procedures for Description and Measurement of Environmental Sound -- Part 5: Sound Level Descriptors For Determination of Compatible Land Use, ANSI S12.9-199x--Part 5." I have passed the required written examination, and have been elected a member in good standing by the Officers and Board of Directors of the Institute of Noise Control Engineering (INCE).

At Ameren's request, on the night of September 2, 2003, Noise Solutions by Greg Zak conducted a sound measurement test at the Elgin Facility while the facility was not operating and while it was fully operational, that is, with all four units at maximum load capacity. The results of this test are contained in the noise report attached to my testimony. In Table 1 of the noise report, my data taken September 2, 2003 is compared to the measurements taken by Power Acoustics, Inc. (PAI) during its June, 2003 tests. I will be referring often to this Table 1.

On September 2, 2003, the measurement location was on the west side of Gifford Road, directly across from Unit 4 and at the same approximate location of the measurements taken by Power Acoustics, Inc. and identified as "L-R2" in PAI's reports and in my report. The weather conditions went from clear to partly cloudy and the wind was from the east at approximately 5 mph during the measurement period. In order to closely duplicate the measurement location used by Power Acoustics, the microphone was located at the edge of a very weedy, insect-infested, field. The close proximity of the microphone to the thick 4 to 6 foot high weeds would later prove to be problematic, due to insect noise in the high frequency portion of the sound spectrum. The ambient measurements began around 9:00 pm to ensure that the time between the ambient and full load operation would be as close together as possible. Ambient measurements ceased at 9:30 pm, as the Ameren Facility was in start-up mode by that time. The measurement was taken during a 30-minute period with only the quietest 10 minutes of data being used to compile the 10 minute ambient.

This very selective data gathering produced ambient results free of any extraneous noise or noise associated with the plant start-up process. It should be noted that the area was very noisy due to ground and air traffic. The ambient was gathered by working around (pausing the analysis instrumentation) the roar of overhead jet traffic, the rumble of distant railroad trains and their whistles, and also truck and automobile traffic on Gifford Road. The large amount of extraneous noise is not reflected in the ambient measurements at all, per the Board's measurement procedures. One of the primary sources of ambient noise was the US Can facility located south of the Ameren Facility on Gifford Road. Sounds that could be heard from US Can included idling trucks, back-up beepers, and intermittent shouting by workers. These extraneous noises are the type that mask and even drown out the noise from the Facility.

The results from this measurement period are found at Table 1, row 4: "10 minute L_{eq} Ambient." A brief explanation of what is meant by the measurement of a 10-minute L_{eq} ambient is in order here. The term ambient refers to all of the sound in the area, except for extraneous sound and any sound emanating from the Ameren Facility. Extraneous sound is of relatively short duration and comes and goes, such as vehicle passbys, aircraft flyovers, train whistles, and so forth. The measurement instrumentation is put in a "pause mode" to avoid including extraneous sound during measurement. It should be noted that the same exclusion of extraneous noise is used to measure the sound levels produced by the noise source of interest, the Elgin Facility. "L_{eq} " as defined in the Board's noise regulations and in this context means that the sound energy is averaged over a period of 600 seconds (10 minutes). The ten minutes referenced here are a composite of all "chunks of time" within the 30-minute time span (9 to 9:30 pm) that were previously defined as ambient.

Measurements commenced at 10:00 pm and ceased at 11:17 pm. The facility was fully operational from approximately 10:10 to 10:51 pm. That is, all four units were running at full load during that time. Of the 41 minutes of measurements collected, I selected the 10 minutes representing the loudest sound levels. These measurements were recorded between 10:25 and 10:42 pm which was a 17 minute time span required to eliminate extraneous noise from other sources. The results of these measurements are recorded in Table 1, row 3: "Raw 10 minute L_{eq} at 447 MW" as raw data.

This Table also includes two other versions of the data, rows 5 and 6: "Corrected 10 minute L_{eq} at 447 MW" and "Corrected and rounded 10 minute L_{eq} at 447 MW". The latter data was rounded for ease of comparison with the existing Board noise emission limitations and those of DuPage County and Cook County, as well as the site specific levels requested by Ameren.

Once the data was collected, we also compared the results with the measurements obtained by Power Acoustics, Inc. on June 18, 2003. At that time, just one unit was operating at full load and an extrapolation of that data was performed by Power Acoustics, Inc. to simulate 4 units at full operational load. The sound pressure levels contained in the Power Acoustics, Inc.

(PAI) report are found at Rows 1 and 2 of Table 1, and the measurements obtained by Noise Solutions by Greg Zak (ZAK) are shown in Rows 3 through 6.

Row 1, which is Table 9 of the PAI report, shows extrapolated data from actual measurements (10 minute L_{eq}) taken of Unit 4 and projected to include Units 1 through 3 to arrive at an estimated sound level maximum. Row 2 contains ambient measurements taken on June 17 that are shown in the PAI report at its Table 6. The ZAK data in Row 3 describes a 10 minute L_{eq}, without corrections, measured on September 2 when the facility was fully operational. Row 4 represents an ambient 10 minute L_{eq} measurement which shows little deviation from the PAI data, until the high frequency octave bands were measured.

The comparison documents a significant difference in decibel levels at the 4000 Hz and at 8000 Hz. The difference of 15 dB higher at 4000 Hz and 20 dB higher at 8000 Hz is largely due to excessive insect sounds that were unavoidable during the measurement period. We surmise that when PAI took its measurements in June, 2003, this property, including the measurement location, was not yet bordered by an overgrowth of thick weeds and brush that are conducive to the harboring of a variety of insects. This overgrown and insect infested area was to the west of the microphone during the ZAK ambient measurement period and would account for these high readings.

When the ZAK corrected levels in Row 5 are compared to the levels obtained by PAI, the operational measurements at full capacity are considerably lower, with the exception of 2000 Hz. At that octave band, the PAI projection was 53.2 dB, while the ZAK measurement was 55.6 dB, a difference of 2.4 dB. Bear in mind that the PAI data represents a projection from the actual measurement of 1 unit running to the theoretical sound levels for all 4 units. Based upon my experience, a 2.4 dB difference between extrapolated data and actual measurements falls well within the many sources of potential error in making an extrapolation from the measurement of one running unit to the actual measurement of 4 units, each with its own subtle characteristics even though each consists of the same turbine model and other necessary equipment and noise abatement controls.

Finally, I compared Ameren's requested site-specific noise emission limitations for the Elgin Facility with a portion of the Board's current limits listed on the attached Table 2. This comparison demonstrates that the limitations proposed in this rulemaking are not significant.

At the 31.5 Hz octave band, the 80 dB limitation requested is equal to the current limit for "Industrial Noise Commercial Receiver Limits", that is, C to B land use, at Section 901.103 of the Board's rules. The limitations requested at 63 Hz through 500 Hz are equal to the "Industrial Noise to Residential Receiver Limits", that is C to A land use, at Section 901.102(a) of the Board's rules, and are considerably below the C to B land use limits of Section 901.103. At the 1000 Hz level, the 58 dB limitation proposed is only 1 dB higher than the 57 dB allowed under the limits for C to B land use. At 2000 Hz, the 58 dB limitation, while exceeding the C to B land use by 6 dB, would not significantly penetrate a house of modern construction when the windows are closed, which is the likely situation when the peakers are operating during periods of very hot or cold weather. At the 4000 Hz level, the 50 dB limitation, while exceeding the C to B land use by 2 dB, would not significantly exceed the levels frequently generated by crickets, locusts, and other insects. Additionally, 4000 Hz is even less able to penetrate a house with closed windows than is 2000 Hz. And, at the 800 Hz level, the proposed 40 dB limitation is equal to the present Section 901.102(a) limit, and 5 dB lower than C to B land use limits.

Let me note here that the approximate A-weighted levels expressed dB(A) are included in Table 2 to provide additional perspective regarding the noise impact. The A-weighted decibel levels are not proposed for adoption because the Board's generally applicable noise emission limitations do not include A-weighted decibel limitations.

Yet another perspective may be helpful. The character of the sound from this type of power plant is often described as similar to that of noise generated by airflow from ventilation within an office building. This type of noise, whether indoors or out of doors, often is absorbed into ambient noise. And, furthermore, the sound emanating from this Facility has been reduced with noise abatement equipment. Care should be taken not to compare it to uncontrolled noise sources.

Site specific noise emission limitations applicable to receiving Class B lands are also requested by Ameren. Six of the nine numerical levels are the same as those currently found at Section 901.103 of the Board's Class B receiving lands. However, at the remaining three octave bands, the 1000, 2000, and 4000 Herz octave bands, the Board's noise limits are more stringent than those requested by Ameren as its site specific limits for Class A receiving lands. Ameren proposes that the Class B site specific noise limits adopted at those octave bands be the same numerical value as those proposed for Class A receiving lands. In my opinion, any environmental impact based upon those numerical changes would be of insignificant consequence.

I also reviewed other state noise programs to see if new or unique regulatory methods are in use. My review of a report of noise regulation in the U.S. shows that noise abatement is not regulated by 43 states. Six states have very little noise regulation. Illinois is more active than the others in regulating noise. I also found that peaker noise is not regulated by the other Region 5 states, California, Texas, or New York. And, finally, peaker noise is not regulated on the federal level.

Local zoning has been a significant factor in many of the noise complaints I have handled. In my experience with the noise complaints filed with the Board, it appears that local zoning has frequently not considered the land buffer component of noise control in making zoning decisions. It should also be noted that the Illinois EPA has received no complaints regarding peaker plant noise during my nearly 30-year career there.

To conclude, in my opinion, based on the thousands of measurements I have taken and several thousand noise complainants I have interviewed, the likelihood of noise complaints regarding the Ameren Facility from the Realen property, should it be developed residentially, is remote. As demonstrated by my prior comparison to other acceptable noise levels, any environmental impact to the Realen property if converted to residential use will be minimal.

Likewise, any environmental impact to receiving Class B lands, if those proposed numerical values are adopted to make the limitations for both types of receiving lands consistent, would be insignificant. In both cases, this is true in part because the extraneous noise of the area is comparable to and oftentimes greater than that attributable to the Ameren Facility.

As always, I enjoyed testifying before you today. Thank you for the opportunity, and I would be pleased to answer any questions that the Board may have at this time.

* * * * *

Petitioner, Ameren Energy Generating Company, reserves the right to supplement or modify this pre-filed testimony.

Respectfully submitted,

By: [signature]
Marili McFawn

Dated: December 3, 2003

Marili McFawn
Schiff Hardin & Waite
6600 Sears Tower
Chicago, Illinois 60606
312-258-5519

TABLE 1

MEASURED AND EXTRAPOLATED SOUND PRESSURE LEVELS FOR AMEREN ELGIN UNITS 1, 2, 3 AND 4, LOCATED AT L-R2 ON GIFFORD ACROSS FROM UNIT 4

Data Source	Description	Date 2003	31.5 Hz.	63 Hz.	125 Hz.	250 Hz.	500 Hz.	1K Hz.	2K Hz.	4K Hz.	8K Hz.	dB(A
PAI[1]	Table 9, Extrapolated Total	6-20	78.4	71.8	63.5	ind	ind	55.0	53.2	45.7	31.9	---
PAI[1]	Table 6, Ambient	6-17	58.1	59.6	55.2	48.3	46.9	45.9	40.7	33.7	22.1	---
ZAK[2]	Raw 10 minute L_{eq} at 447 MW	9-2	73.4	66.5	62.6	57.0	53.0	53.4	55.6	49.2	42.4	60.1
ZAK[2]	10 minute L_{eq} Ambient	9-2	59.2	59.6	54.8	49.7	49.2	44.6	44.4	48.7	42.3	53.7
ZAK[2]	Corrected 10 minute L_{eq} at 447 MW	9-2	73.4	65.5	61.9	56.0	50.7	52.7	55.6	0	0	58.8
ZAK[2]	Corrected and rounded 10 minute L_{eq} at 447 MW	9-2	73	66	62	56	51	53	56	0	0	59
	Il Daytime Class A and DuPage Co.	---	75	74	69	64	58	52	47	43	40	---
	Il Nighttime Class A and DuPage Co.	---	69	67	62	54	47	41	36	32	32	---
	Cook County M1 to A	---	72	71	65	57	51	45	39	34	32	---
	901.103 C →A	---	75	74	69	64	58	52	47	43	40	61
	901.103 C → B	---	80	79	74	69	63	57	52	48	45	---
	Site Specific Rule Requested C → A	---	80	74	69	64	58	58	58	50	40	---
	Site Specific Rule Requested C → B	---	80	79	74	69	63	58	58	50	45	---

Notes: ** Power Acoustics, Inc. Report of June, 2003
*** Noise Solutions by Greg Zak Report of September, 2003

Table 1 above describes the comparison of sound pressure levels contained in the Power Acoustics, Inc. (PAI) report (Rows 1 and 2) with measurements obtained by Noise Solutions by Greg Zak (ZAK) as shown in Rows 3 through 6.

TABLE 2

A COMPARISON OF CURRENT NOISE LIMITS IN ILLINOIS WITH THE AMEREN ELGIN FACILITY SITE-SPECIFIC NOISE EMISSION LIMITATIONS

OCTAVE BAND CENTER FREQUENCY IN HERTZ (HZ)	INDUSTRIAL NOISE TO COMMERCIAL RECEIVER LIMITS Section 901.103	**AMEREN ELGIN FACILITY SITE-SPECIFIC NOISE EMISSION LIMITATIONS**	COMMERCIAL NOISE TO COMMERCIAL RECEIVER LIMITS Section 901.103	INDUSTRIAL NO TO RESIDENTIAI RECEIVER LIMIT Section 901.102a
31.5 HZ	80 dB	**80 dB**	79 dB	75 dB
63 HZ	79 dB	**74 dB**	78 dB	74 dB
125 HZ	74 dB	**69 dB**	72 dB	69 dB
250 HZ	69 dB	**64 dB**	64 dB	64 dB
500 HZ	63 dB	**58 dB**	58 dB	58 dB
1000 HZ	57 dB	**58 dB**	52 dB	52 dB
2000 HZ	52 dB	**58 dB**	46 dB	47 dB
4000 HZ	48 dB	**50 dB**	41 dB	43 dB
8000 HZ	45 dB	**40 dB**	39 dB	40 dB
APPROX. A-WT	66 dB (A)	**64 dB (A)**	62 dB (A)	61 dB (A)

CH2\ 1059845.1

NOISE SOLUTIONS BY GREG ZAK
36 BIRCH DRIVE
CHATHAM, ILLINOIS 62629
(217) 483-3507
(217) 483-5667-FAX
E-mail: gregzak@justice.com

RECEIVED
CLERK'S OFFICE
DEC 4 2003
STATE OF ILLINOIS
Pollution Control Board

Sound Assessment Report
for
Ameren Elgin Facility

by

Greg Zak, INCE

Member of the Institute of
Noise Control Engineering

November 1, 2003

I. INTRODUCTION

Ameren Energy Generating Company, through its attorneys, retained Noise Solutions by Greg Zak to conduct a sound assessment at its Elgin Facility located at 1559 Gifford Road in Elgin on September 2 and 3, 2003. The designated location for measurement was to be across from the Facility, on the west side of Gifford Road, in close proximity to a potential residential development proposed by Realen Homes ("Realen or Realen Property").

The objective was the determine the current sound ambient levels at the Elgin Facility, as well as the operational sound levels, while all 4 peaker units were operating at maximum load. We would then document those levels, analyze for compliance with Illinois noise regulations, report the results, and compare those results to previous studies.

Based upon the results of that survey and evaluation, the conclusion, with a reasonable degree of scientific certainty, is that noise emissions from the peaker units at the Ameren Elgin Facility, would exceed the allowable limits of Section 901.102b for Class C Land impacting Class A Land under Title 35, Sub-Title H, Chapter I of the Illinois Administrative Code (Illinois Noise Regulations) at the Realen property if converted to residential use. As for the Board's limitations at Section 901.103 for Class C Land impacting Class B Land, noise emissions from the Elgin Facility may exceed those limits if any commercial facilities are located near the Elgin Facility.

II. ILLINOIS STATUTES AND REGULATIONS

The land use, where the Elgin Facility peaker units are located, is classified under Appendix B (Standard Land Use Coding Manual) of Part 901 of the State of Illinois Noise Regulations (Title 35, Sub-title H, Chapter I of the Illinois Administrative Code). The appropriate classification is code # 4812, which designates an "electric generation plant." This represents Class C in terms of Part 901. Any residential property in the vicinity would be designated as Class A and any commercial property as Class B. In terms of compliance, it is the Class C to Class A regulatory limits of 901.102(b) and the Class C to Class B regulatory limits of 901.103 that are controlling, peaker facilities are considered a Class C land use, and need to achieve the compliance levels specified in each octave band for Class C (emitter) to Class A (receiver) during daytime and nighttime hours and Class C to Class B at all hours. See Illinois Noise Regulation Tables below.

Illinois Noise Regulation Tables

Section 901.102 Sound Emitted to Class A Land

a) Except as elsewhere in this Part provided, no person shall cause or allow the emission of sound during daytime hours from any property-line-noise-source located on any Class A, B or C land to any receiving Class A land which exceeds any allowable octave band sound pressure level specified in the following table, when measured at any point within such receiving Class A land, provided, however, that no measurement of sound pressure levels shall be made less than 25 feet from such property-line-noise-source.

Octave Band Center Frequency (Hertz)	Allowable Octave Band Sound Pressure Levels (dB) of Sound Emitted to any Receiving Class A Land from		
	Class C Land	Class B Land	Class A Land
31.5	75	72	72
63	74	71	71
125	69	65	65
250	64	57	57
500	58	51	51
1000	52	45	45
2000	47	39	39
4000	43	34	34
8000	40	32	32

b) Except as elsewhere in this Part provided, no person shall cause or allow the emission of sound during nighttime hours from any property-line-noise-source located on any Class A, B or C land to any receiving Class A land which exceeds any allowable octave band sound pressure level specified in the following table, when measured at any point within such receiving Class A land, provided, however, that no measurement of sound pressure levels shall be made less than 25 feet from such property-line-noise-source.

Octave Band Center Frequency (Hertz)	Allowable Octave Band Sound Pressure Levels (dB) of Sound Emitted to any Receiving Class A Land from		
	Class C Land	Class B Land	Class A Land
31.5	69	63	63
63	67	61	61
125	62	55	55
250	54	47	47
500	47	40	40
1000	41	35	35
2000	36	30	30
4000	32	25	25
8000	32	25	25"

Section 901.103 Sound Emitted to Class B Land

Except as elsewhere in this Part provided, no person shall cause or allow the emission of sound from any property-line-noise-source located on any Class A, B or C land to any receiving Class B land which exceeds any allowable octave band sound pressure level specified in the following table, when measured at any point within such receiving Class B land, provided, however, that no measurement of sound pressure levels shall be made less than 25 feet from such property-line-noise-source.

Octave Band Center Frequency (Hertz)	Allowable Octave Band Sound Pressure Levels (dB) of Sound Emitted to any Receiving Class B Land from		
	Class C Land	Class B Land	Class A Land
31.5	80	79	72
63	79	78	71
125	74	72	65
250	69	64	57
500	63	58	51
1000	57	52	45
2000	52	46	39
4000	48	41	34
8000	45	39	32"

III. MEASUREMENTS

Upon arriving in the area, we proceeded to select a measurement location and then become familiar with the topography, weather conditions, and suitability of the site for testing purposes. Various photographs were also taken before proceeding to the plant office. A preparatory meeting was held at the Ameren Elgin Facility Office located at 1559 Gifford Road, Elgin, IL at 7:35 PM on September 2, 2003. We discussed the best time (most representative) to obtain measurements of the ambient or background noise present in the area when the Facility was not operating. The Facility personnel suggested completing the ambient noise measurement before the 9:30 PM start-up, as shutting everything down after 11 PM could take several hours, thus delaying the ambient measurement until the early hours of the morning.

After this brief meeting, we set up our instrumentation at Site 1. See Diagram, Attachment A. This location would be on the west side of Gifford Road, as close as possible to the measurement location used by David Parzych of Power Acoustics, Inc. and identified by him as "L-R2 on Gifford across from Ameren Unit 4." (See "Analysis and Results of Acoustical Measurements Taken Near the Ameren Elgin, Illinois Power Facility During the Operation of the Unit 4 SW501D5A Gas Turbine", 6-20-03, page 16, Table 9).

We decided to begin ambient measurements around 9 PM in order to ensure that the time between the ambient and full-facility operation would be as close together as possible, since the Facility personnel anticipated they would begin their start-up at 9:30 PM. During the entire measurement period, for both ambient and operational measurements taken, it became necessary to pause the analyzer a number of times in order to avoid recording extraneous noise sources, such as airplane flyovers, truck, train and other types of vehicle sound emissions. One of the primary sources of ambient noise was the U.S. Can Company to the south with its idling trucks, back-up beepers, and intermittent shouting by workers. See attached Table 1, row 4, "10 minute L_{eq} Ambient". The dominant noise source in the area in terms of the highest L_{eq} levels present, when we were taking our measurements that evening, was extraneous noise.

The Ameren Elgin Facility, with its 4 peaker units, is located at 1559 Gifford Road in Cook County, Ilinois. The Ameren Facility borders the GE Capital Module Space to the north, and BFI Waste Systems Facility and Commonwealth Edison's high-powered transmission line corridor to the east. Running both north and south, the E E & J Railroad crosses Route 20 to the north. South of the facility are two construction companies and U.S. Can Company. To the west is Gifford Road, and to the west of Gifford Road, is the Realen property.

Also, bordering the Facility to the northwest and west is Bluff City Materials. The area also consists of various industrial plants, whose business is light and heavy-duty manufacturing.

The Facility personnel were instructed by Ameren to run the 4 peaker units at maximum load capacity from approximately 10 PM to 11 PM and to run the wet compression pumps on the two units so-equipped. No water would be injected as it would not increase power output due to the atmospheric conditions present that evening. These pumps were being run to simulate as noisy a condition for plant operation as possible.

The Facility was fully operational from approximately 10:10 to 10:51 PM. Measurements commenced at 10:00 PM and ceased at 11:17 PM. We then returned to the office to discuss our findings and verify the operational conditions occurring at the Facility, while we were taking sound level measurements at Site 1. We left the Elgin Facility at 12:10 AM on September 3, 2003.

The final portion of the sound assessment project was the analysis of fieldwork measurement data, a comparison with the State of Illinois regulatory limits, and the preparation of a written report that documents the measurement results.

1. Measurement Procedures

Since 1987 the Illinois Pollution Control Board has required a l-hour ambient corrected L_{eq} measurement for noise sources, while ambient measurements of 10 minutes duration have been accepted by the Board. For the purposes of this study, it was decided to take all measurements using a duration long enough to obtain a steady, non-changing reading rather than 1 hour. This methodology produces the same sound level measurements that would be obtained over a full hour but in a shorter period of time, in this case, several measurements were taken over a period of 41 minutes. The main factor that went into this decision was the difficulty experienced by the Elgin Facility in keeping all 4 peakers running at full load without any equipment interruption at the Facility for a full hour. For all measurements, it was noted that after the analyzer ran for a very short period of time, there was no significant change in the level measured from that point until all of the data had been gathered. It was obvious that to extend any of the short duration measurements to a full 1-hour would not have changed any of the results. The 10-minute sample in Table 1 was chosen as the most representative for compliance purposes as it represents the longest and loudest sample. It also compares very closely with the 10-minute measurement preceding it and the 10-minute measurement following it. Lastly, the Board has opened a rulemaking to make regulatory changes to its noise measurement procedures and has proposed to adopt the type of short period measurement procedures we used in this study.

Ambient daytime measurements were taken from 9:00 PM to 9:30 PM on September 2, 2003 to determine the background sound levels at Site 1. See Attachment 1 and Table 1.

The analyzer was calibrated before and after the ambient measurements were taken. Battery condition of all equipment was monitored continuously. Weather observations were made prior to and at the end of the measurement period. During this test, the weather conditions went from clear to partly cloudy, wind speeds of 0 to 5 mph from the east were blowing directly from the peakers to the microphone, and the wind was from the east. In order to closely duplicate the measurement location used by Power Acoustics, the microphone was located at the edge of a very weedy, insect-infested, field. The close proximity of the microphone to the thick 4 to 6 foot high weeds would later prove to be problematic, due to insect noise in the high frequency portion of the sound spectrum.

The ambient measurements began around 9:00 PM to ensure that the time between the ambient and full load operation would be as close together as possible. Ambient measurements ceased at 9:30 PM, as the Ameren Facility was in start-up mode by that time. The measurement was taken during a 30-minute period with only the quietest 10 minutes of data being used to compile the 10-minute ambient. This very selective data gathering produced ambient results free of any extraneous noise or noise associated with the plant start-up process. It should be noted that the area was very noisy due to ground and air traffic. The ambient was gathered by working around (pausing the analysis instrumentation) the roar of overhead jet traffic, the rumble of distant railroad trains and their whistles, and also truck and automobile traffic on Gifford Road. The large amount of extraneous noise is not reflected in the ambient measurements at all, per Board measurement procedures. Given the large amount of extraneous noise recorded, and based on the thousands of measurements I have taken and several thousand noise complainants I have interviewed, my opinion is that the likelihood of noise complaints from the Realen development regarding the Ameren Facility is remote.

During the period of time when the ambient was measured, the temperature was 65° F at the beginning of the measurement period and 65° F at the end. The humidity was 87% at the beginning of the measurement period and 87% at the end. The barometric pressure was 30.06 in. Hg. at the beginning of the measurement period and 30.06 in. Hg. at the end. The measurement protocol generally followed that portion of the Illinois Pollution Control Board's (Board) L_{eq} requirement for obtaining an ambient. Measurements were taken simultaneously in one-third-octave band, octave band, and dB(A). The primary noise source was the U.S. Can Company to the south, with idling trucks, back-up beepers, and employees shouting. Plane flyovers and other traffic noise were audible. Distance from the testing site to the exhaust stack on Unit #4 was 169 yards (507'). The distance was measured with our firm's laser range finder which is accurate to +/-1 yard.

The peaker noise measurements started at 10:00 PM, at Site 1, when the peaker units were operational. During this test, wind speeds of 0 to 5 mph from the east were measured at the microphone. The temperature was 65° F at the beginning of the measurement period and 62° F at the end. The humidity was 90% at the beginning of the measurement period and 96% at the end. The barometric pressure was 30.06 in. Hg. at the beginning of the measurement period and 30.06 in. Hg. at the end. Measurements were taken simultaneously in octave band, one-third-octave band, and dB(A). Measurements commenced at 10:00 PM and ceased at 11:17 PM. The Facility personnel told us that all 4 peakers were fully operational from approximately 10:10 to 10:51 PM. Of the 41 minutes of measurements collected, we selected the 10 minutes representing the loudest sound levels. These measurements were recorded between 10:25 and 10:42 PM which was a 17-minute time span required to eliminate extraneous noise from other sources. The results of these measurements are recorded in Table 1, row 3: "Raw 10 minute L_{eq} at 447 MW" as raw data. This Table also includes two other versions of the data, rows 5 and 6: "Corrected 10 minute L_{eq} at 447 MW and "Corrected and rounded 10 minute L_{eq} at 447 MW". The latter data was rounded for ease of comparison with the existing Board noise emission limitations and those of DuPage County and Cook County, as well as the site specific levels requested by Ameren. The one-third octave band measurements indicated the presence of no prominent discrete tones which are regulated under Section 901.106 of the Board's noise regulations.

2. Equipment

A Larson-Davis Laboratories Model 2900B Real Time Analyzer with associated microphone and pre-amplifier was used to perform the measurements. This combination of instrumentation meets the requirements for a Type 1 Sound Level Meter, as defined in American National Standards Institute (ANSI) S1.4-1983 and ANSI S1.4A-1985. This instrumentation also meets the requirements of International Electro-technical Commission (IEC) 651 for a Type 1 SLM and IEC 804 for a Type 1 Integrating SLM. (Note: An integrating SLM is preferred for this type of measurement). The octave band-filters in the Model 2900B Real Time Analyzer meet the requirements of IEC 225 and ANSI S1.11-1985. The microphone and pre-amplifier were mounted on a tripod and separated from the analyzer by a 10-foot cable.

Calibration was performed using a Larson-Davis Laboratories Model 250 calibrator that meets the Type 1 requirements for acoustical calibrators. Calibration was performed before and after the measurements, and did not vary by more than 0.1 dB. The measurements were performed in accordance with applicable American National Standards.

The Larson-Davis Laboratories Model 250 calibrator and Model 2900B Real Time Analyzer were returned to the factory for calibration in November and December of 2002 (see copies of Calibration Certificates, Attachment B, 2 pages).

PHOTOGRAPH 1

Photograph taken at Site 1 with camera pointed east toward Ameren Elgin Facility (see Attachment A, Map).

PHOTOGRAPH 2

Photograph taken on east side of Gifford Road with camera pointed toward the west at Site . See Attachment A, Diagram of Facility.

IV. RESULTS AND DISCUSSION

The sound study objectives were to determine by field measurement the current noise daytime and nighttime ambient levels, the operational levels with all of the peakers running and compare those levels to the State of Illinois noise regulations.

The results from this measurement period are found at Table 1, row 4: "10 minute L_{eq} Ambient." A brief explanation of what is meant by the measurement of a 10-minute L_{eq} ambient is in order here. The term ambient refers to all of the sound in the area, except for extraneous sound and any sound emanating from the Ameren Facility. Extraneous sound is of relatively short duration and comes and goes, such as vehicle passbys, aircraft flyovers, train whistles, and so forth. The measurement instrumentation is put in a "pause mode" to avoid including extraneous sound during measurement. It should be noted that the same exclusion of extraneous noise is used to measure the sound levels produced by the noise source of interest (Ameren Facility). The term "L_{eq}" is defined in the Board's noise regulations and in this context means that the sound is energy averaged over a period of 600 seconds (10 minutes). The ten minutes referenced here are a composite of all "chunks of time" within the 30-minute time span (9 to 9:30 PM) that were previously defined as ambient.

Once the data was collected, we also compared the results with the measurements obtained by Power Acoustics, Inc. on June 17, 2003. At that time, just one unit was operating at full load and an extrapolation of that data was performed by Power Acoustics, Inc. to simulate 4 units at full operational load. The sound pressure levels contained in the Power Acoustics, Inc. (PAI) report are found at Rows 1 and 2 of Table 1, and the measurements obtained by Noise Solutions by Greg Zak (ZAK) are shown in Rows 3 through 6.

Row 1, which is Table 9 of the PAI report, shows extrapolated data from actual measurements (10 minute L_{eq}) taken of Unit 4 and projected to include Units 1 through 3 to arrive at an estimated sound level maximum. Row 2 contains ambient measurements taken on June 17 that are shown in the PAI report at its Table 6. The ZAK data in Row 3 describes a 10-minute L_{eq}, without corrections, measured on September 2 when the facility was fully operational. Row 4 represents an ambient 10-minute L_{eq} measurement which shows little deviation from the PAI data, until the high frequency octave bands were measured.

The sound levels we recorded were generally lower than or near the numerical limits extrapolated by the June Power Acoustics report. For example, the levels at the 31.5 Hz octave band were 5 decibels lower than the Power Acoustics' number of 78.4, i.e., 73.4 decibels (the nighttime standard is 69 dB). However, at the 2000 Hz octave band, the noise level was measured at 2.4 decibels higher than projected by Power Acoustics. Therefore, this results in sound levels approximately 20 decibels over the nighttime standard. See Table 1.

The comparison documents a significant difference in decibel levels at the 4000 Hz and at 8000 Hz. The difference of 15 dB higher at 4000 Hz and 20 dB higher at 8000 Hz is largely due to excessive insect sounds that were unavoidable during the measurement period. We surmise that when PAI took its measurements in June, 2003, this property, including the measurement location, was not yet bordered by an overgrowth of thick weeds and brush that are conducive to the harboring of a variety of insects. This overgrown and insect-infested area was to the west of the microphone during the ZAK ambient measurement period and would account for these high readings.

When the ZAK corrected levels in Row 5 are compared to the levels obtained by PAI, the operational measurements at full capacity are considerably lower, with the exception of 2000 Hz. The PAI projection was 53.2 dB, while the ZAK measurement was 55.6 dB, a difference of 2.4 dB. It must be borne in mind that the

PAI data represents a projection from the actual measurement of 1 unit running to the theoretical sound levels for all 4 units. It has been my experience that only a 2.4 dB difference between extrapolated data and actual measurements falls well within the many sources of potential error in making an extrapolation from the measurement of one running unit to the actual measurement of 4 units, each with its own subtle characteristics even though they consist of the same modern construction and model of unit.

Finally, we compared Ameren's requested **site-specific noise emission limitations** for their Elgin Facility with a portion of the Board's current limits listed in Table 1. This comparison demonstrates that the limitations proposed in this rulemaking are not significant.

At the 31.5 Hz octave band, the 80 dB limitation requested is equal to the current limit for "Industrial Noise Commercial Receiver Limits", that is, C to B land use, at Section 901.103 of the Board's rules. The limitations requested at 63 Hz through 500 Hz are equal to the "Industrial Noise to Residential Receiver Limits", that is C to A land use, at Section 901.102a of the Board's rules, and are considerably below the C to B land use limits of Section 901.103. At the 1000 Hz level, the 58 dB limitation proposed is only 1 dB higher than the 57 dB allowed under the limits for C to B land use. At 2000 Hz, the 58 dB limitation, while exceeding the C to B land use by 6 dB, would not significantly penetrate a house with the windows closed during periods of very hot or cold weather. At the 4000 Hz level, the 50 dB limitation, while exceeding the C to B land use by 2 dB, would not significantly exceed the levels frequently generated by crickets, locusts, and other insects. Additionally, 4000 Hz is even less able to penetrate a house with closed windows than is 2000 Hz. At the 8000 Hz level, the proposed 40 dB limitation is equal to the present Section 901.102a limit, and 5 dB lower than C to B land use limits.

When ambient levels fall ten or more decibels below the noise source, there is no correction needed. This is because the actual correction is less than 0.5 dB, which is lost in the rounding process. Ambient levels, within 3 dB or less of the levels measured for a noise source, call for assigning a zero to any octave band measurements, meeting this criteria per the ANSI standards. The corrections made for ambient effects are illustrated in Table 1, row 5. It should be noted that 4K Hz and 8K Hz ambient levels are within 3 dB or less of the levels measured for the Ameren Elgin Facility, thus these two octave bands are assigned a zero.

The measured data was compared to the applicable Illinois noise regulations, in the case of this study, Sections 901.102 (C →A) and 901.103 (C →B) of the Board's regulations.

V. CONCLUSIONS AND RECOMMENDATIONS

It is concluded with a reasonable degree of scientific certainty that noise emissions from the Ameren Elgin Facility's four peaker units will exceed the allowable limits of Section 901.102b of Title 35, Sub-Title H, Chapter I of the Illinois Administrative Code (Illinois Noise Regulations) at the Realen property if that property is developed residentially.

In order to avoid exceeding the numerical limits at Section 901.102b for Class C→ Class A and Section 901.103 for Class C→Class B listed in Table 1, our recommendation would be for the Ameren Elgin Facility to pursue a Site Specific Rule change with the Illinois Pollution Control Board. This recommendation is based upon the comparison of the Board's existing noise limitations which may apply at the Realen property and the minimum noise limitations considered necessary for Ameren to comply with if the Realen property is developed residentially. In our opinion, that comparison demonstrates that the difference in the between the two sets of numerical limits is not significant. Furthermore, the likelihood of noise complaints based upon the noise emissions from the Ameren Elgin Facility is remote due in large part to the high levels of extraneous noise in the area of the this Facility. Finally, for the purposes of continuity, we also recommend that site specific numerical values be proposed for Class B receiving lands so those limitations conform the Class A limitations requested by Ameren.

Greg Zak

Greg Zak, MA, INCE
Member,
Institute of Noise Control Engineering

TABLE 1

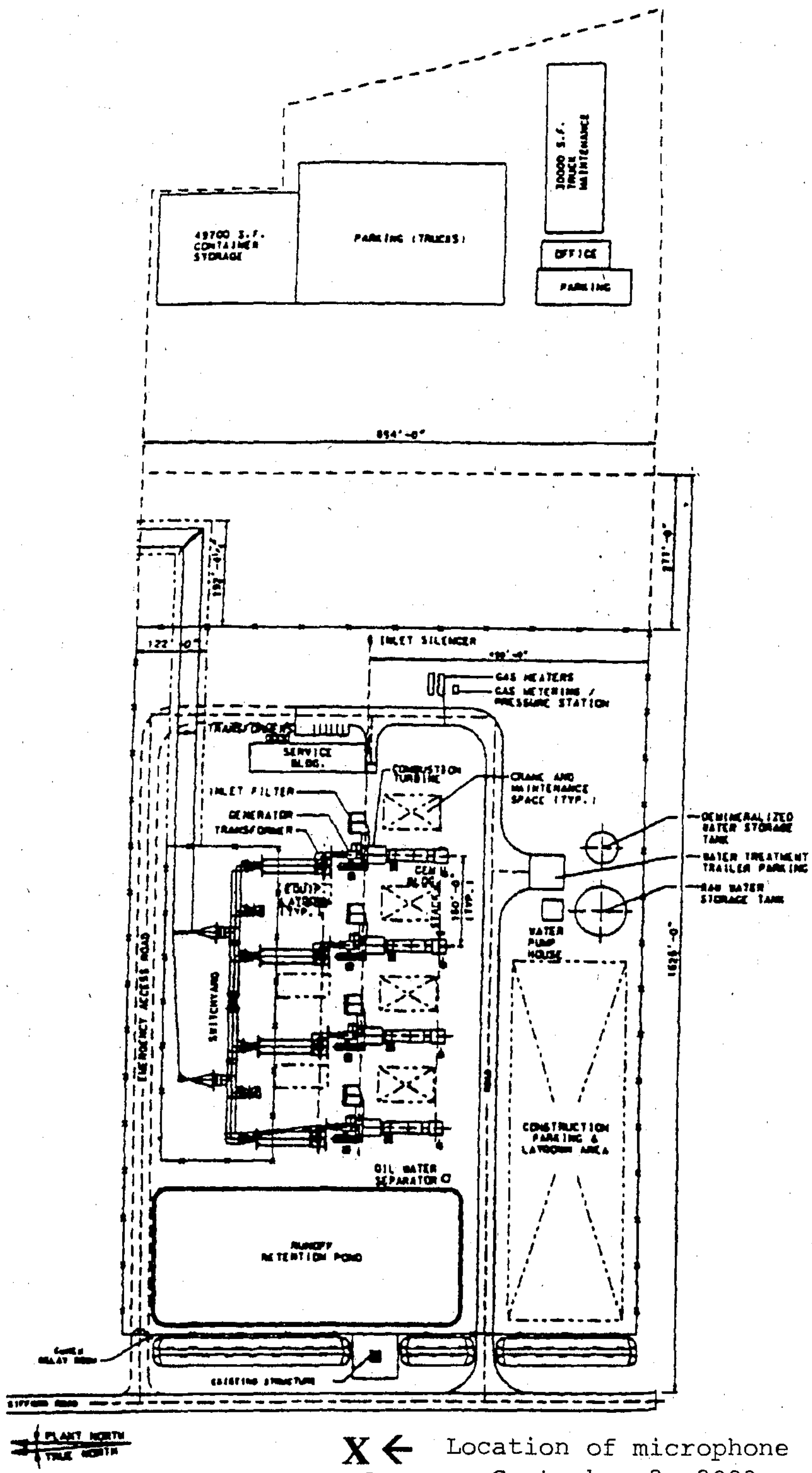
MEASURED AND EXTRAPOLATED SOUND PRESSURE LEVELS FOR AMEREN ELGIN UNITS 1, 2, 3 AND 4, LOCATED AT L-R2 ON GIFFORD ACROSS FROM UNIT 4

Data Source	Description	Date 2003	31.5 Hz.	63 Hz.	125 Hz.	250 Hz.	500 Hz.	1K Hz.	2K Hz.	4K Hz.	8K Hz.	dB(A)
PAI[1]	Table 9, Extrapolated Total	6-20	78.4	71.8	63.5	ind	ind	55.0	53.2	45.7	31.9	---
PAI[1]	Table 6, Ambient	6-17	58.1	59.6	55.2	48.3	46.9	45.9	40.7	33.7	22.1	---
ZAK[2]	Raw 10 minute L_{eq} at 447 MW	9-2	73.4	66.5	62.6	57.0	53.0	53.4	55.6	49.2	42.4	60.1
ZAK[2]	10 minute L_{eq} Ambient	9-2	59.2	59.6	54.8	49.7	49.2	44.6	44.4	48.7	42.3	53.7
ZAK[2]	Corrected 10 minute L_{eq} at 447 MW	9-2	73.4	65.5	61.9	56.0	50.7	52.7	55.6	0	0	58.8
ZAK[2]	**Corrected and rounded 10 minute L_{eq} at 447 MW**	**9-2**	**73**	**66**	**62**	**56**	**51**	**53**	**56**	**0**	**0**	59
	Il Daytime Class A and DuPage Co.	---	75	74	69	64	58	52	47	43	40	---
	Il Nighttime Class A and DuPage Co.	---	69	67	62	54	47	41	36	32	32	---
	Cook County M1 to A	---	72	71	65	57	51	45	39	34	32	---
	901.103 C → B	---	80	79	74	69	63	57	52	48	45	---
	Site Specific Rule Requested C → A	---	80	74	69	64	58	58	58	50	40	---
	Site Specific Rule Requested C → B	---	80	79	74	69	63	58	58	50	45	---

CH2\ 1060118.1

MAP

ATTACHMENT A



X ← Location of microphone on September 2, 2003 "LR-2"

ATTACHMENT B

Certificate of Calibration and Conformance

Certificate Number 2002-45865

Instrument Model CAL250, Serial Number 0761, was calibrated on 11-22-2002. The instrument meets factory specifications per Procedure D0001.8192.

Instrument found to be in calibration as received: YES
Date Calibrated: 11-22-2002
Calibration due: 11-22-2003

Calibration Standards Used

MANUFACTURER	MODEL	SERIAL NUMBER	INTERVAL	CAL. DUE	TRACEABILITY NO.
Larson Davis	2559	2504	12 Months	03/22/2003	10476-1
Larson Davis	2900	0661	12 Months	04/05/2003	2002-40830
Schaevitz	P3061-15PSI	17590	12 Months	04/17/2003	233890
Hewlett Packard	34401A	3146A10352	12 Months	05/17/2003	236846
Hewlett Packard	34401A	US36033460	12 Months	08/22/2003	243025
Larson Davis	MTS1000/2201	0111	12 Months	09/12/2003	09121-2002
Larson Davis	PRM902	0480	12 Months	09/17/2003	2002-43989
Larson Davis	PRM915	0112	12 Months	10/04/2003	2002-44406

Reference Standards are traceable to the National Institute of Standards and Technology (NIST)

Calibration Environmental Conditions

Temperature: 22 ° Centigrade — Relative Humidity: 24 %

Affirmations

This Certificate attests that this instrument has been calibrated under the stated conditions with Measurement and Test Equipment (M&TE) Standards traceable to the U.S. National Institute of Standards and Technology (NIST). All of the Measurement Standards have been calibrated to their manufacturers' specified accuracy / uncertainty. Evidence of traceability and accuracy is on file at Corporate Headquarters. An acceptable accuracy ratio between the Standard(s) and the item calibrated has been maintained. This instrument meets or exceeds the manufacturer's published specification unless noted.

This calibration complies with the requirements of ISO 17025 and ANSI Z540. The collective uncertainty of the Measurement Standard used does not exceed 25% of the applicable tolerance for each characteristic calibrated unless otherwise noted.

Due to state-of-the-art limitations, 4:1 calibration ratios are not possible on pressure measurement standards, microphones and acoustic calibrators. Calibration ratios for these types of devices are limited to 1:1.

The results documented in this certificate relate only to the item(s) calibrated or tested. A one year calibration is recommended, however calibration interval assignment and adjustment are the responsibility of the end user. This certificate may not be reproduced, except in full, without the written approval of the issuer.

Before: 114.02 dB, 250.0 Hz @ 1013 mbar.
After: 114.02 dB, 250.0 Hz @ 1013 mbar.

Technician: Scott Montgomery
Service Center: Larson Davis Laboratories, Utah

Signed: Scott Montgomery

LARSON DAVIS LABORATORIES
1681 West 820 North · Provo, Utah · 84601 · Phone (801) 375-0177

ATTACHMENT B

Certificate of Calibration and Conformance

Certificate Number 2002-46556

Instrument Model 2900, Serial Number 1070, was calibrated on 12-18-2002. The instrument meets factory specifications per Procedure D0001.8146, ANSI S1.11 1986, ANSI S1.4 1983, IEC 651-Type 1 1979, and IEC 804-Type 1 1985, IEC1043 Class 1 when normalized.

Instrument found to be in calibration as received: YES
Date Calibrated: 12-18-2002
Calibration due: 12-18-2003

Calibration Standards Used

MANUFACTURER	MODEL	SERIAL NUMBER	INTERVAL	CAL. DUE	TRACEABILITY NO.
Larson Davis	LDSigGn/2209	0617 / 0104	12 Months	01/31/2003	2002-39473

Reference Standards are traceable to the National Institute of Standards and Technology (NIST)

Calibration Environmental Conditions

Temperature: 22 ° Centigrade

Relative Humidity: 26 %

Affirmations

This Certificate attests that this instrument has been calibrated under the stated conditions with Measurement and Test Equipment (M&TE) Standards traceable to the U.S. National Institute of Standards and Technology (NIST). All of the Measurement Standards have been calibrated to their manufacturers' specified accuracy / uncertainty. Evidence of traceability and accuracy is on file at Corporate Headquarters. An acceptable accuracy ratio between the Standard(s) and the item calibrated has been maintained. This instrument meets or exceeds the manufacturer's published specification unless noted.

This calibration complies with the requirements of ISO 17025 and ANSI Z540. The collective uncertainty of the Measurement Standard used does not exceed 25% of the applicable tolerance for each characteristic calibrated unless otherwise noted.

Due to state-of-the-art limitations, 4:1 calibration ratios are not possible on pressure measurement standards, microphones and acoustic calibrators. Calibration ratios for these types of devices are limited to 1:1.

The results documented in this certificate relate only to the item(s) calibrated or tested. A one year calibration is recommended, however calibration interval assignment and adjustment are the responsibility of the end user. This certificate may not be reproduced, except in full, without the written approval of the issuer.

As received data is the same as shipped data.

Technician: Brent Heaton
Service Center: Larson Davis Laboratories, Utah

Signed: [signature]

1681 West 820 North · Provo, Utah · 84601 · Phone (801) 375-0177

NOISE SOLUTIONS BY GREG ZAK

36 BIRCH DRIVE
CHATHAM, ILLINOIS 62629
(217) 483-3507
(217) 483-5667-FAX
e-mail: gregzak@justice.com

Greg Zak, INCE

RESUME

EXPERIENCE

Greg Zak has over 31 years of experience dealing with noise measurement, noise control engineering and the effects of noise on people and communities. He established Noise Solutions by Greg Zak in March of 2001, which has become a full time activity since August 1, 2001. Since its inception, Noise Solutions by Greg Zak has served 41 clients from the power industry, government, as well as private citizens. Currently, Greg Zak has appeared before the Illinois Pollution Control Board as a private noise consultant recognized as an expert witness. In the past, he has acted as the Illinois Environmental Protection Agency's noise expert in nearly all enforcement and regulatory hearings before the Illinois Pollution Control Board, and in several Illinois Circuit Court hearings related to noise zoning and nuisance. His experience includes industrial, commercial, residential, urban, rural and construction noise. He represented the Illinois EPA, as the EPA's Noise Expert, when testifying before the Illinois Pollution Control Board's hearings captioned "NATURAL GAS FIRED, PEAK-LOAD ELECTRICAL POWER GENERATING FACILITIES (PEAKER PLANTS)", PCB R01-10, August 23, 2000 and October 5, 2000.

He has been a member of a Society of Automotive Engineering Committee, and is currently a member of the American National Standards Institute Working Group on the Measurement and Evaluation of Outdoor Community Noise. He was selected by Governor Edgar to sit on the Blasting Task Force mandated by House Joint Resolution 133 and chaired by the Illinois Department of Natural Resources.

Noise issues dealt with have frequently involved the technical practicability and economic reasonableness of reducing or eliminating the noise emissions from the source. The ability to work with the public, elected and appointed officials, and consultants has been a hallmark of Greg Zak's noise program at IEPA. The needs of both the Agency and the public have been carefully balanced. Thousands of Illinois residents with noise complaints have been assisted through his self-help program.

As a national and international author in the area of environmental noise, Greg Zak has presented papers on controlling noise at national and international noise conferences. He is currently a member of the working group for the American National Standards Institute's American National Standard for "Quantities and Procedures for Description and Measurement of Environmental Sound -- Part 5: Sound Level Descriptors For Determination of Compatible Land Use, ANSI S12.9-199x--Part 5.

Greg Zak has passed the required written examination, and has been elected a member in good standing by the Officers and Board of Directors of the Institute of Noise Control Engineering (**INCE**). Sat for INCE

Membership Exam on December 14, 1995. Received letter of notification of acceptance for membership from the President of INCE dated January 12, 1996.

CHRONOLOGY OF EXPERIENCE

IEPA Noise Advisor 14+ years

Responsible for the I.E.P.A. Noise Program. Responsibilities included:
1) noise control efforts in the solid waste area and assisting citizens with noise complaints. Technical assistance for federal, state, and local governments to establish the degree of (or lack of) compliance with Illinois Noise Regulations;
2) making noise control engineering recommendations for abating noise emissions for federal, state, and local governments;
3) working with both solid waste sites, and manufacturers of acoustical materials and devices, to insure system compatibility and obtain the desired noise reduction;
4) assisting the public with a self-help procedure to obtain relief from various noise pollution sources (3000 to 4000 phone calls annually);
5) Advising counties and cities in the process of developing noise ordinances and noise measurement standards (provided classroom instruction for the Will County Sheriff's Department in July '99, and for the Taylorville Police Dept. in Jan. '98);
6) Answering questions from industry, consultants, and legislators, as to how the various noise regulations apply in different situations;
7) Advising the State Police Crime Lab on measuring noise from guns equipped with silencers and taking the measurements for the lab;
8) Testifying under subpoena as an expert, numerous times, in environmental noise in enforcement cases, variance hearings, and regulatory hearings before the Illinois Pollution Control Board. Testifying under subpoena as an expert, numerous times, in environmental noise in enforcement and zoning cases before an Illinois Circuit Court. Addressing environmental noise issues in zoning cases before county zoning boards at their request. Below is a partial list of recent noise hearings in which Greg Zak qualified as an **expert witness**:

- **Pollution Control Board (ENFORCEMENT)**

  PCB 00-140, Knox v. Turris Coal Company, June 11, 2002.
  PCB 00-163, McDonough v. Robke (car wash), November 13, 2001.
  PCB 00-219, Brill v. Latoria d/b/a TL Trucking Foodliner, September 26, 2001.
  PCB 00-221, Glasgow, et. al. v. Granite City Steel, July 10 & 11, 2001.
  PCB 00-90, Young v. Gilster-Mary Lee Corporation, April 10, 2001.
  PCB 99-19, Roti, et. al. v. LTD Commodities, Inc., November 2, 1999.
  PCB 98-81, Cohen, et. al. v. Overland Trucking, May 13, 1998.
  PCB 96-110, Sara Scarpino & Margaret Scarpino v. Henry Pratt Company, October 11, & July 19, 1996.
  PCB 96-53, David and Susi Shelton v. Steven and Nancy Crown, August 21, & July 3, 1996.
  PCB 93-15, Dorothy & Michael Furlan v. University of Illinois School of Medicine, July 29, 1996.
  PCB 96-22, Lew & Patricia D'Souza v. Richard & Joanne Marraccini, December 12, 1995.
  PCB 94-146, Dorothy Hoffman v. City of Columbia, Illinois, December 11, 1995.
  PCB 90-146, Village of Matteson v. World Music Theatre et al., July 27, 1992.
  PCB 91-195, Thomas v. Carry Companies of Illinois, Inc., July 22, 1992.
  PCB 91-50, Christ v. Compost Enterprises, Inc., June 2, 1992.
  PCB 90-182, Tex v. Coggeshall, et al., January 9, 1992.

PCB 91-30, Curtis, Diesing, Vil. Crystal Lake v. Material Service Corp., Vil. of Lake in the Hills, December 17 & 18, 1991.
PCB 90-149, Moody & Madoux v. Strader's Logging & Lumber, 6-27-91.
PCB 90-148, Moody & Madoux v. B & M Steel Service, June 26, 1991.
PCB 90-59, Christianson v. American Milling Company, 6-27 & 9-6-90.
PCB 90-108, Stratton v. Little Caesar's Pizza, August 30, 1990.
PCB 89-169, Zarlenga v. Partnerships Concepts, et al., July 7 & 24, 1990.
PCB 89-205, Zivoli v. Prospect Dive and Sport Shop, June 14, 1990.
PCB 89-179, Martin v. Oak Valley Wood Products, Inc., 2-2 & 4-6-90.
PCB 88-171, Hagan v. Brainard, January 17, 1989.
PCB 87-171, Moore v. Archer Daniels Midland, August 5 & 29, 1988.
PCB 87-139, Annino v. Browning Ferris Industries, Jan. 13, 1988.
U.S. Bankruptcy Court, Northern Dist. Ill., East. Div., Case # 91 B 11678, (re. One Bloomingdale Place, PCB 92-178)
Testimony, January 3, 4, & 28, 1994; Deposition, January 20 & 21, 1994.
Deposition, January 5, 1993; Testimony, June 29, 1993.
Pollution Control Board (RULEMAKING);
R91-25, Amendments to 35 I.A.C. Subtitle H: Noise - Pertaining to Definitions, Measurement Procedures, and Sound Emission Standards Relating to Certain Noise Sources.-- November 25 & 26, 1991.
Pollution Control Board (VARIANCE);
PCB 88-188, Shell Oil, September 18, 1990.
Circuit Court (ENFORCEMENT);
98-CH-16, People v. Bobby-T's, Inc., Mason County, October 13, 1999.
91-CH-242, People v. Watts (Sangamon Valley Landfill), Sangamon County. Deposition, October 15, 1993 ; Testimony, December 19, 1993.
93-CH-230, People v. Metro Ice Company, Inc., St. Clair County, October 14, 1993.
88-L-35, Lang v. Rangemasters Pistol Club, Williamson County, December 4, 6, & 12, 1990.
Circuit Court (ZONING);
89-L-95, Brown v. White, Adams County, Re. Factory noise, June 4 & 5, 1990.
89-CH-23, Lambrecht v. Will County, Re. Limestone quarry development, February 22, 1990.
86-CH-22, Anderson v. City of Effingham, Effingham County, Re. Truck stop, July 25, 1988.
County Zoning Board (ZONING)
At the request of local authorities, Greg Zak testified regarding deficiencies in the noise study and report prepared by INDECK for Petition No. 99-04, Public Hearing, McHenry County Zoning Board of Appeals, INDECK Request for a Conditional Use Permit to Allow the Construction and Operation of an Electrical Generating Facility (gas turbine), April 16, 1999.
Petition No. 96-61, Construction & Operation of a Gravel Pit in McHenry County, March 27, & April 8, 1997.
City Planning Commission (ZONING);
Hoffman Estates, residents v. Tyre Works, Inc., July 7, 1999.
Hoffman Estates, residents v. Tyre Works, Inc., June 19, 1996.
Effingham, Anderson v. Petro, Re. truck stop, April 6, 1989.

Below is a partial list of **Pollution Control Board** noise hearings in which Greg Zak was involved as a **consultant** in resolving the conflict:

PCB 98-18, Metz, et. al. v. U.S. Postal Service and Bradley Real Estate, Springfield, September 1, 2000.
PCB 98-84, Behrmann v. Okawville Farmers Elevator-St. Libory, February 4, 1999.
PCB 96-20, Norman, et. al. v. U.S. Postal Service, Barrington, January 2, 1997.

PCB 96-69, Corning v. Hegji, June 20, 1996.
PCB 92-38, Howard v. Caterpillar, Inc., September 3, 1992.
PCB 90-146, Village of Matteson v. World Music Theatre et al., July 27, 1992.
PCB 90-201, Dravis v. M & D AG, April 29, 1992.
PCB 91-128, Druen v. Leonard, January 30, 1992.
PCB 89-44, Western v. Moline Corporation, October, 1991.
PCB 90-145, Comer v. Gallatin National Balefill, September 3, 1991.
PCB 91-51, Collins v. Roberts Fish & Food, June 14, 1991.
PCB 89-168, Daidone et al. v. Lexington Square, January 19, 1990.
PCB 88-199, People of the State of Illinois v. Seegers Grain, Inc., March/April, 1989.

ACOUSTICAL SOCIETY OF AMERICA

Currently a member of the Model Ordinance Working Group, that is in the process of developing procedures for regulating community noise.

ANSI COMMITTEE

Currently a member on the American National Standards Institute Working Group on the Measurement and Evaluation of Outdoor Community Noise (S12-15).

SAE COMMITTEE

Served as a member of the Society of Automotive Engineers Construction Site Sound Level Committee, S.A.E. ConAg Committee (10-7-92 to 2-25-93).

INTERGOVERNMENTAL PROJECTS

City of Taylorville, Illinois, in 1997-8, input was provided to the City Attorney regarding how to simplify the state noise regulations for inclusion into a local ordinance. Noise monitoring equipment recommendations were given to the Chief of Police. A seminar was given to the patrolmen based on the newly adopted ordinance, equipment purchased, and measurement procedures used by the Illinois EPA. A written exam was prepared and administered to all attendees.

Illinois State Police, in 1997, noise measurements of gunfire were taken at the Chicago lab. These measurements established that abatement recommendations totalling approximately $30,000 were successfully implemented at the Chicago lab after plans for 3 shooting rooms in the Lab under construction were reviewed and recommendations were made to minimize gunfire noise impact for areas not originally designed as a shooting area (1996). Noise abatement recommendations totalling approximately $10,000 were successfully implemented at the Springfield lab (1993), and $8,000 at the Morton lab (1995). Measured gunfire noise at the forensic labs in Springfield, Metro-East, Morton, Joliet, Carbondale, and Rockford for potential hearing damage (1992-95).

Illinois Department of Conservation, Reviewed plans for shooting range (Des Plaines Range) in Will County and met with design engineers to suggest noise abatement strategy (3-4-93). Conducted a one day seminar for

Conservation Police Officers on how to use a sound level meter to measure boat noise to enforce the newly enacted noise regulations for watercraft (7-2-92).

Illinois Department of Nuclear Safety, Low Level Nuclear Waste Sites, reviewed, suggested changes, and met with developers regarding needed modifications to comply with Noise Regulations, 11-1-90.

Illinois Department of Agriculture, measured noise emission levels from HVAC and emergency generator at headquarters, submitted detailed noise control engineering plans to mitigate complaints from neighbors. Attended several meetings and assisted the **Capital Development Board** with technical details of solution. Noise problems were solved, 6-1-90.

Illinois Department of Commerce and Community Affairs, reviewed and suggested changes for plans to comply with Noise Regulations for: 1. proposed Toyo Koki plant, 5-26-89; and 2. proposed UPS facility in Willow Springs, 5-4-89.

Illinois Attorney General. Visited **K-5 Asphalt Plant** in DuPage county at invitation of, and with representatives of AG to make recommendations to mitigate noise problems (6-22-92). Written opinion for Howard Chinn, Chief Engineer, on measuring **gunfire** noise on Fast meter response versus L_{eq} (5-20-89).
Reviewed detailed 1987-8 blasting noise and vibration study at **Columbia Quarry** in Columbia. Suggested procedural changes in blasting protocol to minimize complaints from neighbors (4-7-89).
Noise measurements at **Mervis Industries** in Danville with a representative of the Attorney General's Office, along with consultant and attorney for Mervis regarding a pending enforcement action (7-15-88).

CHRONOLOGY OF PUBLISHED WRITINGS

Acknowledged for assistance and input, as a member of the Blasting Task Force in the publication entitled, "Blasting Task Force Final Report, House Joint Resolution 133, May, 1997."

Acknowledged for assistance and input, as a member of the Working Group, into ANSI S12.9-199x/Part 5 by Dr. Paul D. Schomer, Chairman of the Accredited Standards Committee entitled, "Quantities and Procedures for Description and Measurement of Environmental Sound - Part 5: Sound Level Descriptors For Determination of Compatible Land Use, March, 1997."

Acknowledged for assistance and input into; an article prepared for the Construction Safety Council of Chicago by Don Garvey, CIH, CSP, entitled, "Community Noise Regulations, 1997."

Acknowledged for assistance and input, as a member of the Working Group, into ANSI S12.9-1996/Part 4 by Dr. Paul D. Schomer, Vice Chairman of the Accredited Standards Committee entitled, "Quantities and Procedures for Description and Measurement of Environmental Sound - Part 4. Assessment Methods, January, 1996."

Acknowledged for assistance and input into; two reports/studies prepared for the Illinois Pollution Control Board by Dr. Paul Schomer entitled, "Impulse Noise Study, December 1990," and "Proposed Revisions to Property-Line-Noise-Source Measurement Procedures, June 1991."

NOISE CONTROL AT THREE HAZARDOUS/TOXIC WASTE CLEANUP AND INCINERATION SITES IN ILLINOIS USA. Presented at INTER-NOISE 89 (International Noise Conference) in Newport Beach, Calif. December 5, 1989. Published in the INTER-NOISE 89 PROCEEDINGS.

Co-author of; "Illinois' Experience in Tracking Hazardous Waste Activities Through Manifests and Annual Reports" presented at the HAZPRO PROFESSIONAL SYMPOSIUM in Baltimore, Maryland on May 16, 1985.

ESTABLISHMENT OF A CALIBRATION LABORATORY FOR THE ILLINOIS ENVIRONMENTAL PROTECTION AGENCY, DIVISION OF NOISE POLLUTION CONTROL, presented at the National Noise and Vibration Control Conference and Exhibition, April 1979, and published in the 1979 NOISEXPO PROCEEDINGS.

Contributing author of Insertion Loss (or Gain) of Windscreens presented at 1978 Society of Automotive Engineers Conference and published in Society of Automotive Engineers Proceedings.

Acknowledged for assistance and input into; The Transfer Function of Quarry Blast Noise and Vibration into Typical Residential Structures, February 1977, prepared by Kamperman & Associates, Inc. under Contract 68-01-4134 for the U.S. Environmental Protection Agency Office of Noise Abatement and Control, Washington D.C., 20460.

Performed the function of Technical Reviewer for the U.S. Department of the Interior, Bureau of Mines, manuscript titled; "Blast Noise Annoys." (1976)

Co-author of; "Quarry Blasting and the Neighbors" presented at Inter-Noise 76 in Washington D.C. on April 6, 1976.

Acknowledged for assistance and input into; "Quarry Blast Noise Study" by Kamperman & Associates, Inc. for the Illinois Institute for Environmental Quality, December, 1975.

Acknowledged for assistance and input into; Blast Noise Standards and Instrumentation, Bureau of Mines Environmental Research Program Technical Progress Report 78, May 1974, U.S. Department of the Interior.

Co-author of; Comparison of Noise Levels and Citizen Complaints presented at Inter-Noise 74 in Washington D.C., 1974.

IEPA Compliance Assurance Unit Manager 5 years

Responsible for the supervision of sub-unit managers (2). The scope of responsibility covered insuring compliance by all facilities required to: 1) report ground water monitoring data; 2) report on underground injection control wells; 3) submit copies of manifests for individual shipments of special waste (300,000 per year); 4) issue hauling permits to transporters of special waste; 5) submit annual reports (10,000) on hazardous waste activity; 6) insure collection of all fees due the State for disposal, treatment, injection, or hauling hazardous (special) waste; and 6) insure computer tracking of items 1 through 5.

IEPA Noise Regional Manager 3 years

Responsible for the supervision of four Environmental Protection Specialists and all noise field operation activities in central and southern Illinois. Responsible for the calibration, programming, and systems development for all electronic systems and transducers.

IEPA Environmental Protection Specialist I through III 6 years

Responsible for investigating noise complaints. Investigation included in field interviews of complainants and alleged violators, along with sound level data gathering using precision sound level meters and tape-recorders. Detailed analysis was performed by Greg Zak in the laboratory. Noise control engineering solutions were drawn up to demonstrate the economic and technical practicability solving noise problems in cases before the Illinois Pollution Control Board (Board).

Meetings were held with alleged violators to arrive at an agreeable program of voluntary compliance with the Illinois Noise Regulations. Technical data was prepared and submitted to the Illinois Attorney General for use in litigation.

Acted as the primary Agency representative during the last 3 years in various studies of air blast and ground vibration peculiar to quarrying and surface mining. In addition to appearing as an expert witness for the Agency before the Board, Greg Zak drew up interim blasting noise and vibration regulations and presented these to the Mining Industry Task Force on Impulsive Noise and Vibration to which he was a member.

Greg Zak has appeared as an expert witness for the Agency at the request of the Board as to the acoustic effectiveness of the noise barriers he designed for the Terminal Railroad Association of St. Louis in their Venice, Illinois Classification Yard.

Greg Zak established a Calibration Laboratory for the Division of Noise Pollution Control along with the laboratory procedures for insuring traceability of calibration work to the National Bureau of Standards. In addition, he was responsible for electronic checks to insure proper functioning of field and laboratory instrumentation.

USMC Military Electronics Instructor 1 year

Responsible for discipline and instruction of 30 marine students in basic electronics.

USMC Radar Technician 2 years

Responsible for maintenance and repair of several military radar systems.

<u>CERTIFICATIONS</u>

He has passed the required written examination, and in December, 1995 was elected a member in good standing by the Officers and Board of Directors of the Institute of Noise Control Engineering (**INCE**).

Sat for the examination for certification by the BOARD OF HAZARD CONTROL MANAGEMENT as a CERTIFIED HAZARDOUS MATERIALS MANAGER on May 17, 1985. Received certification as a CERTIFIED HAZARDOUS MATERIALS MANAGER at the MASTERS LEVEL (**CHMM**).

EDUCATION

B.S., Biology, San Diego State University, 1971.
M.A., Public Administration, University of Illinois at Springfield, 1974.

VETERAN

U.S.M.C., 1963-1966, Radar Technician, Electronics Instructor. Honorably discharged as a Sergeant.

zak\resume'.doc
CH2\ 1060558.1

Due to the volume of this pleading,

please contact the Clerk's Office

at

312/814-3629

to view this file.