

TECHNICAL MEMORANDUM

TO: Dave Plagge
Fagen Engineering, LLC

FROM: Tim Colliton, PE, CIH, Wenck Associates, Inc.

DATE: December 5, 2012

SUBJECT: Big Blue Noise Study Protocol
Wenck Project No. 2759-02

This technical memorandum presents the proposed Noise Study Protocol for the Big Blue LWECS installation. The purpose of the proposed protocol is to satisfy the requirements of Section 6.6 (Noise) of the Site's Public Utilities Commission permit.

The anticipated tasks for and features of the noise study include:

- Sound level measurements at up to six locations near the perimeter of the site. The preferred locations will be on public lands or rights of way. Locations near residences will be selected if possible.
- The line of sight distances from measurement location to operating turbines will vary from about 500 to 1,500 meters as may be practical.
- The measurement instrumentation is expected to be battery operated data logging audio dosimeters. The instruments will be selected to log the sound level on the 'A' scale (fast response) as well as the sound pressure levels in the octave bands from 31.5 Hz to 8,000 Hz.
- The measurement duration at each location will be about 22 hours. After each measurement period, the logged data will be collected and the instrument battery replaced/recharged for the next measurement.
- The requirements for measurement conditions contained in the Minnesota Pollution Control Agency (MPCA) publication "A Guide to Noise Control in Minnesota" will be followed to the extent practical.

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- The meteorological information (wind speed, direction, temperature and relative humidity) is expected to be available from and provided by the site owner/operator.
- Sound measurements will not be made during periods of precipitation or if precipitation is forecast within 24 hours.
- The collected octave band and 'A' scale sound level data will be summarized in a brief technical report. The 'A' scale sound level data will be analyzed according the MPCA procedures and compared with the sound level limits in Minnesota Rules §7030.

All study activities will be conducted either by me or by Wenck personnel under my direction. Attached is a copy of my resume for your reference.



Timothy J. Colliton, PE, CIH

Principal/Project Engineer

AREAS OF EXPERTISE:

- Industrial hygiene
- Industrial ventilation
- Indoor air quality
- Mold/moisture control
- Acoustics and noise control

EDUCATION:

MS, Environmental Health, University of Minnesota, 1973
BME, Mechanical Engineering, General Motors Institute, 1972

REGISTRATION:

Professional Engineer: MN
Certified Industrial Hygienist in the Comprehensive Practice (1979) and Acoustical Aspects of Industrial Hygiene (1976)

PROFESSIONAL MEMBERSHIPS:

Upper Midwest Section of the American Industrial Hygiene Association

PROFESSIONAL EXPERIENCE:

2000-Present
Wenck Associates, Inc.

1993 - 2000
Colliton Env. Consulting Corp.
Principal and CEO

1992 – 1993
Twin City Testing Corporation
Supervisor

1990 – 1992
Nova Env. Services, Inc.
Technical Supervisor

1983 – 1989
Pace Laboratories, Inc.
Supervisor

1976 – 1983
Industrial Health Engineering Associates, Inc.
Consultant

1973 – 1976
Bolt, Beranek & Newman, Inc.
Consultant

INTRODUCTION

Mr. Colliton has over thirty-five years of professional experience with pollution control engineering projects ranging from initial planning through detailed engineering and installation. Mr. Colliton's services are offered in the broad areas of Environmental Engineering and Control with emphasis in Industrial Hygiene, Air Pollution Control, Indoor Air Quality, Engineering and Design and Expert Opinions. Examples of project experience include:

SELECTED EXPERIENCE

Industrial Hygiene

Process Safety Management (PSM) Compliance. Performed PSM audits, updates, and process hazard analyses for multiple plants using sulfur dioxide in their refining process. Client was able to demonstrate compliance with the PSM standard when inspected by OSHA.

Process Safety Management (PSM) Compliance. Performed PSM audits and process hazard analyses for multiple plants with large ammonia refrigeration systems. One of the goals was to streamline the PSM program to improve usability and functionality.

Process Hazard Analysis (PHA) – Soybean Oil Extraction. Performed a PHA for a new soybean oil extraction plant while under construction. PHA findings led to process design changes to prevent potentially hazardous hexane vapor conditions.

Process Hazard Analysis (PHA) – Canola Oil Extraction. Performed a PHA for an existing canola oil extraction plant that had a history of fires & explosions. The PHA process identified recommendations for physical and operational plant design changes to reduce the fire/explosion hazard potential..

Lead Decontamination. Electronic manufacturing facility had lead deposits on overhead surfaces caused by lead soldering. The project included identification and measurements of lead levels, cleaning surfaces or removal of contaminated materials followed by re-evaluation of lead levels. Client received decontaminated facility for reuse.

Drug Exposure Evaluation. Medical device manufacturing operation uses immune system depressant drug (with potential reproductive effects) in one of their processes. This project involved measurement of airborne exposure to the drug during the process. The sampling results showed that exposures were non-detectable indicating acceptable process controls and respiratory protection devices were not needed.

Flavoring Ingredient Evaluation. Designed and executed air sampling and analysis strategies to evaluate sources of flavoring ingredient vapors in food processing. Procedures included short sampling times followed by on site analysis using a field gas chromatograph. The data was used to reduce exposures through improved housekeeping and ventilation of the processes.

Industrial Ventilation Design

Asbestos Exposure Control. An asbestos milling operation in northern British Columbia requested assistance to re-design the plant ventilation system to control personnel exposure to asbestos. The system design included a total exhaust airflow rate of 250,000 cubic feet per minute. The exhaust ductwork design was complex due to equipment layout in the six-story mill building. The system reduced personnel exposures to below the regulatory limits.

Catalytic Oxidizer Installation. To meet carbon monoxide emission limitations from engine test activities, a ventilation system was designed to convey the engine exhaust to a catalytic oxidizer. The system was sized to operate from 1,700 cubic feet per minute (cfm) to 8,500 cfm depending on the number of tests in progress. The oxidizer achieves 98% destruction of carbon monoxide and unburned fuel.

Acoustics/Noise Control

Highway Noise Modeling. Expansion of a local interstate highway triggered the need for modeling the future highway noise impacts in the area and design of appropriate noise barriers. Using traffic volume projections from the Minnesota Department of Transportation, the highway noise was calculated using the MINNOISE computer model. To reduce the impact at sensitive residential receptors, the effectiveness of noise barrier walls was modeled. The most cost effective noise barriers were selected for construction along the highway.

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Principal/Project Engineer

Baseline Environmental Noise Monitoring. As part of the siting and permitting process for an alternative fuel electrical generation facility, baseline environmental noise measurements were made at the site boundaries and at nearby sensitive (residential) receptors. The results were used in the plant design process to minimize noise impacts in the vicinity.

Environmental Noise Impact Evaluation. To support the EIS for a new aggregate mining operation, baseline environmental noise measurements were made at the proposed mine site boundaries. These measurements along with measurements at an operating mine were used to predict the operational noise levels at nearby sensitive (residential) receptors. The effect of blasting at the residences and at a nearby utility pipeline was also evaluated. The environmental effects were found to be within appropriate regulations/guidelines.

Baseline Environmental Noise Monitoring and Operational Noise Estimation. As part of the design process for a fossil fuel electrical generation facility, baseline environmental noise measurements were made at the site boundaries and at nearby sensitive (residential) receptors. These results, in conjunction with noise level emission estimates for the plant equipment, will be to estimate the local noise level during plant operation. This information is used to guide equipment selection so that noise levels will be within regulatory guidelines.

PUBLICATIONS

Chapter 9, Building Features for Hazard Control, in "In-Plant Practices For Job Related Health Hazards Control, Volume 2, Engineering Aspects", John Wiley & Sons, April 1989.



In the Matter of the Application of
Big Blue Wind Farm, LLC for a Large Wind
Energy Conversion System (LWECS) Site Permit
for the 36 MW Big Blue Wind Farm in Faribault
County

CERTIFICATE OF SERVICE

KERRI M. KATERS, certifies that on December 6, 2012 she served true and correct copies of the following:

- Big Blue Wind Farm Decommissioning Plan;
- Letter from Fagen, Inc. to Big Blue Wind Farm, LLC regarding the information and costs for Decommissioning;
- Noise Study Protocol Memo for the Big Blue Wind Farm; and
- Notice to MPUC of the new Field Representative and Site Manager for the Big Blue Wind Farm

upon the following parties via e-filing and/or U.S. Mail:

Person	E-mail Address	Company	Address	Method of Service
Burl W. Haar	burl.haar@state.mn.us	MN Public Utilities Commission	121 7th Place East Suite 350 St. Paul, MN 55101-2147	Electronic Service
Sharon Ferguson	sharon.ferguson@state.mn.us	MN Department of Commerce	85 7th Place East Suite 500 St. Paul, MN 55101-2198	Electronic Service
Julia Anderson	Julia.anderson@state.mn.us	MN Office of the Attorney General	1400 Bremer Tower 445 Minnesota Street St. Paul, MN 55101-2131	Electronic Service
John Lindell	agorud.ecf@state.mn.us	Office of the Attorney General-RUD	900 Bremer Tower 445 Minnesota Street St. Paul, MN 55101-2130	Electronic Service
Stacy Kotch	stacy.kotch@state.mn.us	MN Department of Transportation	395 John Ireland Blvd. St. Paul, MN 55155	Electronic Service
Dustin Shively	crudeen@exergydevelopment.com	Exergy Development Group	802 West Bannock Suite 1200 Boise, ID 83702	Electronic Service
Aaron Fagen	N/A	Fagen, Inc.	501 West Highway 212 PO Box 159 Granite Falls, MN 56241	Paper Service

/s/ Kerri M. Katers

Kerri M. Katers