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Carlsbad, CA 92010
619-609-0712

December 30, 2015

Mr. Michael Balliet
County of Santa Clara
Department of Environmental Health
1555 Berger Drive Suite #300
San Jose, CA 95112

Re: Lehigh Southwest Cement Company
Burns & McDonnell Sound Compliance Study Peer Review

Mr. Balliet:

At the request of the County of Santa Clara Department of Environmental Health (DEH) dBF Associates, Inc. (dBFA) conducted a peer review of the Lehigh Southwest Cement Company Sound Compliance Study performed by Burns & McDonnell (B&M) (December 2015). The following are our observations and review of the study methodology and analysis performed by B&M.

Work Plan

Prior to the start of the study, the B&M Work Plan was reviewed. In our opinion, the proposed approach and methodology was consistent with generally accepted industry standards.

Sound Survey

A sound survey was performed on September 8 and 9, 2015. Ian Brewe led the sound survey for B&M. Peder Eriksson observed the sound survey for DEH. I observed the sound survey for dBFA.

B&M staff performed the sound level measurements at the agreed upon locations using three American National Standards Institute (ANSI) S1.4 type 1 sound-level meters (Larson-Davis Model 831). B&M provided the current calibration certificates for the sound level meters. Far-field measurements (outside the plant in the community) were taken during four time periods over a 24-hour period on September 8 and 9, 2015. Near-field measurements (near the plant equipment) were taken on the morning of September 9, 2015.



Prior to conducting the sound level measurements, I accompanied three B&M staff members to each of the agreed upon locations where sound level measurements were to be performed. Minor adjustments were made to determine the optimal location to perform the measurements. B&M staff then separated into teams and proceeded to perform the sound level measurements during the daytime, mid-day, evening, and nighttime periods.

During the measurement periods, I proceeded on my own to each of the locations to observe Burns & McDonnell staff perform the sound level measurements. I performed my own random sound level measurements during the evening and nighttime periods at MP5, MP11, MP15 and MP16 as shown on Figures 4-2 and 4-3 of the B&M study. The sound level measurements were performed using a calibrated Rion NA28, ANSI S1.4 type 1 sound-level meter. The sound level measurements were within +/- 1.5 dBA L_{eq} and L_{90} of the measurements performed by B&M during the same time interval. Noise from the plant was not audible at the measurement locations due to extraneous noise produced by distant vehicular traffic and crickets. Plant operational and meteorological conditions during the measurement period are presented in the B&M report and appear to be correct, based on conversations with B&M, Lehigh staff and my own observations.

In our opinion, B&M staff performed the sound survey according to generally accepted industry standards.

Sound Modeling

B&M used the Datakustik Cadna/A noise prediction model to estimate noise levels from the plant noise sources to the measurement locations. The model uses industry-accepted propagation algorithms and accepts sound power levels (in decibels re: 1 picoWatt) and sound pressure levels based on International Organization for Standardization (ISO) 9613-2 standards. ISO 9613-2 is an internationally recognized standard that establishes a method for calculating the attenuation of sound during propagation outdoors in order to predict the levels of environmental noise at a distance from a variety of sources. The Cadna/A model is considered by many industry professionals as state-of-the-art.

dBFA reviewed the Cadna/A electronic data files developed by B&M. Source sound levels were obtained from the near-field sound level measurements performed by B&M within the plant. In our opinion, the Cadna/A model was developed and calibrated according to generally accepted industry standards and



represents a conservative estimate of noise from the plant at the measurement locations.

Compliance Analysis

B&M applied the most restrictive noise limits available under the Santa Clara County ordinance, a limit of 40 dBA at residential properties during nighttime hours and 50 dBA during daytime hours. The lowest, or minimum, L_{90} sound levels measured at each location during the midnight or morning time period best represent the sound emitted by the plant without the influence from extraneous noises. Although the County Noise Ordinance is based on the Equivalent Sound Level (L_{eq}), dBFA agrees with the use of L_{90} because it more accurately reflects the plant noise level at the measurement locations by eliminating a substantial portion, but not necessarily all of the higher noise levels from ambient noise sources, such as vehicular traffic and crickets that are prevalent throughout the community. In addition to the measured values from the sound survey, B&M utilized the sound modeling results to analyze the amount of plant-generated sound at each location.

B&M concluded that the sound levels generated at the plant are in compliance with the most restrictive limits (40 dBA nighttime and 50 dBA daytime) contained in Santa Clara County's noise ordinance at the surrounding residential communities. dBFA agrees with the conclusions.

Recommendations

dBFA was requested by County staff to recommend general measures that may further reduce noise levels from the plant if warranted. A more detailed analysis of the plant's equipment and processes would be required to provide site specific recommendations. However, additional engineering controls at the noise source may further reduce noise from the plant. Measures to reduce noise levels from the plant generally include the following:

- Replace selected components with quieter components.
- Reduce the speed of stack exhaust fans.
- Install acoustic silencers within the stack.
- Install strategically placed noise barriers.

The amount of noise reduction resulting from the implementation of one or a combination of these measures is unknown without additional analysis.





Mr. Michael Balliet
December 30, 2015
Page 4

In conclusion, the Sound Compliance Study was performed consistent with generally accepted industry standards. Please contact me at 619-609-0712 x101 if you have any questions.

Sincerely,

dBF ASSOCIATES, INC.



Jeffrey D. Fuller, INCE
Principal

