

## Traffic Engineering, Transportation Planning & Design

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David R. Shropshire, PE, PP  
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February 11, 2022

Pierson Pleasantville, LLC  
c/o Mr. Brian J. Murphy, P.E., P.P., C.M.E.  
MV Engineering, LLC  
P.O. Box 484  
Cape May Court House, NJ 08210

(via email: b.murphy@mvengllc.com)

Re: **Sound Level Evaluation**  
**Proposed R.E. Pierson Concrete Plant**  
**Dennis Township, Cape May County, NJ**  
SA Project No. 22016

Dear Brian:

At your request, Shropshire Associates, LLC has prepared a sound level evaluation to support the Dennis Township Zoning Board application and evaluate the impact of the sound pressure levels to be generated by the proposed R.E. Pierson Materials concrete plant facility located along westbound Woodbine Ocean View Road (CR 550) in Dennis Township, Cape May County, NJ. The property contains several material storage buildings. The property is located just west of the Woodbine Ocean View Road & Corsons Tavern Road intersection. The proposal is for the construction of a new concrete mixing facility.

The purpose of this evaluation is to provide sound pressure level (SPL) data to be representative of ambient conditions (area/neighborhood residual noise), source-on conditions (total noise in the environment including the source of interest), and project SPLs based on recorded SPL measurements at a comparable site. The scope of this evaluation is as follows:

- Review the layout of the existing site.
- Identify target areas to conduct ambient sound pressure level (SPL) measurements as per information provided by the project team and via a field investigation of existing site characteristics.
- Identify all sources contributing sound to the point of measurement.
- Survey the area on foot to identify any other sound sources which may affect measurements.
- Conduct daytime and nighttime ambient sound pressure level measurements at the proposed site, in accordance with the procedures outlined in the New Jersey State Noise Control Act (N.J.A.C. 7:29), to determine the existing sound pressure levels.
- Conduct ambient and source-on sound pressure level measurements at a comparable site for comparison to the proposed site.



- Estimate projected sound pressure levels to the residential areas in the vicinity of the site and determine the impact on the environmental character of the surrounding area with respect to noise.
- Evaluate the current and projected sound pressure levels in relation to State standards. The New Jersey State daytime and nighttime noise thresholds for continuous airborne sound at a residential property line for noise generated by the site is 65 A-weighted decibels (dBA) between 7:00 AM to 10:00 PM and 50 dBA between 10:00 PM to 7:00 AM, respectively. The threshold to non-residential property lines is 65 dBA without time stipulations.
- Prepare sketches identifying location of measurements.

### **Site Characteristics**

The proposed site (Figure 1) is located along westbound Woodbine Ocean View Road, just west of its intersection with Corsons Tavern Road in Dennis Township, Cape May County, New Jersey. The proposed site currently contains an existing sand mining plant with several material storage buildings. The proposal is for the addition of a concrete mixing facility within the existing property. Access to the proposed site will continue to be utilized via the two (2) existing full-movements driveways along westbound Woodbine Ocean View Road. To the west is a truck repair shop. Opposite Woodbine Ocean View Road to the south are several individual developments such as a plumbing facility, brewery, and storage facilities. To the east is a transformer station. Adjoining the proposed site to the northeast is an existing campground residential community.

The comparable (existing) site (Figure 2) is located along westbound Sherman Avenue (CR 552) between Wilson Avenue and West Boulevard in the City of Vineland, Cumberland County, New Jersey. The site contains an R.E. Pierson Materials concrete mixing facility.

### **Sound Level Measurement Equipment**

All sound pressure level (SPL) data was collected using a Quest Model 2900, Type 2, Sound Level Meter. The unit was calibrated using a Quest QC-10 Calibrator (114dB – 1000Hz), at the start and end of each study and at one-hour intervals. A windscreen was used to minimize the effect of wind gusts. A Kestrel 2000 Thermo Wind Meter was used for temperature and wind speed measurements. The sound level meter and calibrator were factory-calibrated and certified on October 25, 2021. All SPL tests were conducted using the A-weighting network in the slow meter response mode. The tests were conducted utilizing the SPL function setting on the noise meter.

### **SPL Data Collection Conditions**

In conjunction with calibrating the sound level meter, temperature and wind measurements were recorded. Both the temperature and wind readings were within the ranges specified in the New Jersey State Noise Control Act. The recorded temperatures during the SPL measurements at both the proposed and existing sites ranged between 33° during the AM to 53° during the PM, and wind gusts did not exceed 3 MPH (see attached Table 1).



### **Proposed Site SPL Data Collection**

Ambient (neighborhood residual) sound represents all sounds in the environment, other than noise from the source of interest. Ambient SPL measurements were conducted at the proposed site between 6:00 AM to 8:00 AM to capture the daytime and nighttime periods on Thursday, February 10, 2022 (see attached Tables 2 and 3). The ambient measurement location was approximately 1,450-feet from the proposed concrete facility location (Location A; Figure 1).

The daytime ambient recorded SPLs ranged between 45 dBA – 53 dBA, and the nighttime ambient recorded SPLs ranged between 44 dBA – 50 dBA. The primary sources of ambient noise were typical operations on-site, backup beacons for trucks on-site, birds, area traffic, and wind. Extraneous sources of noise during the measurements were overhead planes. Overhead planes were recorded at 52 dBA.

### **Comparable Site SPL Data Collection**

Source-on (total) sound represents all sounds in the environment, including sound from the source of interest. Source-on SPL measurements were taken at the existing R.E. Pierson Materials concrete mixing facility located along westbound Sherman Avenue in the City of Vineland, Cumberland County between 9:20 AM to 10:20 AM on Thursday, February 10, 2022 (see attached Table 4). Measurements were recorded approximately 170-feet from the concrete mix loading area for trucks (Location B). The measurement location and measurements were recorded such that the SPLs are assumed to be solely from typical operations of the concrete mixing facility, including trucks queuing, loading the trucks, as well as the concrete mixing operation.

The source-on recorded SPLs ranged between 59 dBA – 65 dBA during the period when trucks were queuing and loading on-site, and between 64 dBA – 73 dBA during the period when the conveyor was running for concrete mix preparation and trucks were loading on-site. The primary sources of source-on noise were operations of the facility, traffic on the adjacent roadway, birds, and wind. Extraneous sources of noise were motorcycles and loud vehicles/trucks on the adjacent roadway.

### **Corrected (Source) Sound Pressure Levels**

Corrected (source) levels can best be described as the level of noise being emitted solely from the source of interest; however, the noise level emitted solely from the source cannot be measured directly from a specific activity. The noise level emitted solely from the source is calculated from arithmetic difference between the source-on (total) level and the ambient (background) level. It is important to note that per the procedure outlined in N.J.A.C. 7:29, the *highest* overall recorded ambient measurement is subtracted from the *lower* range of the source-on readings. This difference, if less than 10.0-dBA and greater than 3.0-dBA, is then correlated with the corresponding correction factor as outlined in N.J.A.C. 7:29-2.10, Table 1. The correction factor is then deducted from the *lower* source-on or total measurement yielding the corrected (source) sound level. Measurements that result in a difference of less than 3.0-dBA are generally regarded as unenforceable, meaning that the noise emitted from the source has a negligible impact on the ambient level. If the difference between the source-on and ambient levels is greater than 10.0 dBA, then no correction is necessary, and the recorded source-on measurement is considered solely a result of the noise generated by the source. The



correction factors as outlined in N.J.A.C. 7:29-2.10, Table 1 are determined by decibel subtraction (decibels are a logarithmic scale) using the following formula:

$$\text{Corrected (Source) Level} = 10 \log \left( 10^{\frac{\text{total sound level}}{10}} - 10^{\frac{\text{background level}}{10}} \right)$$

However, in this case the source-on measurements are assumed to be solely from typical operations of the concrete mixing facility, and no corrections were made to provide for conservation analyses.

### **SPL Projection**

The source SPLs at the comparable site was recorded approximately 170-feet from the concrete mix loading area for trucks (Figure 2; Location B). Due to site geometrics as well as operations on-site, it was not feasible to record measurements at a greater distance that would match the 1450-foot distance from the proposed concrete mixing facility at the Ocean View facility to the nearest residential area (adjacent campground).

The dissipation of sound pressure levels follows a modified inverse square law, whereby SPLs are reduced by half with a doubling of distance. Please note that decibels are a logarithmic scale. The inverse square law can be expressed using the formula (wherein "d" is distance):

$$\text{SPL}_2 = \text{SPL}_1 + 10 \log \left( \frac{d_2}{d_1} \right)^2 = \text{SPL}_1 + 20 \log \left( \frac{d_2}{d_1} \right)$$

Using the above formula, the lower range of source SPLs, as specified in N.J.A.C. 7:29, of 59 dBA (representing the loading of concrete trucks) and 64 dBA (representing the conveyor/concrete mix preparation and truck loading) recorded at 170-feet are anticipated to dissipate to 40 dBA and 45 dBA, respectively, at a distance of 1,450-feet. The source SPLs projected to the nearest residential area at the proposed site is anticipated to conform to the State Noise Control Act requirements for daytime and nighttime noise levels. Using logarithmic addition, the combined existing SPLs and proposed source SPLs results in minimal changes to the existing SPLs.

Conservatively projecting the higher range, contrary to the procedures outlined in N.J.A.C. 7:29, of source SPLs of 65 dBA (loading of trucks) and 73 dBA (conveyor/concrete mix preparation and truck loading) recorded at 170-feet are anticipated to dissipate to 46 dBA and 54 dBA at a distance of 1,450-feet, which is comparable to existing recorded sound pressure levels.



## **Conclusions**

Based on the analyses presented in this evaluation, the following conclusions are provided:

1. The primary source of ambient sound pressure levels at the proposed site were on-site operations, traffic on the adjacent roadways, birds, and wind. The ambient measurements currently conform to the State Noise Control Act (N.J.A.C. 7:29) requirements for daytime and nighttime noise levels along the northern property line, which represents the nearest residential area.
2. The source sound pressure levels at the comparable site were conservatively assumed to be solely a result of operations on-site, and no correction was made. The source SPLs projected to the nearest residential area at the proposed site is anticipated to conform to the State Noise Control Act requirements for daytime and nighttime noise levels.

Should you have any questions or require additional information, please feel free to contact us.

Sincerely,  
**Shropshire Associates LLC**

A handwritten signature in black ink, appearing to read 'Randal C. Barranger', written over the printed name.

Randal C. Barranger, P.E.  
Project Manager / Partner

*RCB/jab*  
*Attachments*

Table 1 R.E. Pierson Materials Dennis Township, Cape May County, NJ Weather Conditions					
Date	Location	Time	Conditions	Temp.	Wind
Thursday Feb 10, 2022	Proposed Site Dennis Township	6:08 AM	Clear	33°F	< 2 MPH
		7:02 AM	Clear	35°F	< 2 MPH
		8:01 AM	Clear	37°F	< 2 MPH
Thursday Feb 10, 2022	Comparable Site City of Vineland	9:20 AM	Clear	45°F	< 2 MPH
		10:20 AM	Clear	53°F	< 3 MPH

Table 2 R.E. Pierson Materials Dennis Township, Cape May County, NJ Nighttime Ambient Measurements at Proposed Site - 10 February 2022			
Location	Time	Reading Range (dBA)	Comments
A	6:11 - 6:18 AM	43 - 51	Primary sources of noise: traffic; on-site operations.; birds; wind
	6:18 - 6:24 AM	43 - 51	
	6:24 - 6:28 AM	45 - 51	Extraneous sources of noise: overhead planes (52 dBA)
	6:28 - 6:35 AM	44 - 53	
	6:35 - 6:54 AM	44 - 51	
	6:54 - 7:00 AM	46 - 51	

Table 3 R.E. Pierson Materials Dennis Township, Cape May County, NJ Daytime Ambient Measurements at Proposed Site - 10 February 2022			
Location	Time	Reading Range (dBA)	Comments
A	7:04 - 7:10 AM	47 - 52	Primary sources of noise: traffic; on-site operations.; birds; wind
	7:10 - 7:16 AM	46 - 53	
	7:16 - 7:24 AM	46 - 53	Extraneous sources of noise: overhead planes
	7:24 - 7:43 AM	44 - 51	
	7:43 - 8:00 AM	47 - 51	

Table 4 R.E. Pierson Materials Dennis Township, Cape May County, NJ Source-On Measurements at Comparable Site - 10 February 2022			
Location	Time	Reading Range (dBA)	Comments
B (Trucks on Site)	9:21 - 9:31 AM	59 - 65	Primary sources of noise: operations on-site, truck loading, area traffic, wind
	9:31 - 9:41 AM	68 - 71	
	9:41 - 9:46 AM	51 - 62	
	9:46 - 9:48 AM	61 - 65	
B (Conveyor)	9:48 - 9:50 AM	70 - 71	Primary sources of noise: operations on-site, truck loading, area traffic, wind
	9:50 - 9:52 AM	66 - 71	
	9:52 - 10:00 AM	71 - 73	
	10:00 - 10:04 AM	64 - 66	



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FIGURE 1 - PROPOSED SITE  
SITE LOCATION MAP



R.E. PIERSON MATERIALS  
384 WOODBINE OCEAN VIEW ROAD  
OCEAN VIEW, NJ  
10 FEBRUARY 2022

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FIGURE 2 - EXISTING SITE  
SITE LOCATION MAP



R.E. PIERSON MATERIALS  
184 W. SHERMAN AVENUE  
VINELAND, NJ  
10 FEBRUARY 2022