



October 22, 2012

Concerned Blanchet Neighbors  
c/o Leland Bruch  
8018 Meridian Avenue North  
Seattle, WA 98103

Subject: Blanchet High School Football Game Noise

Ladies and Gentlemen:

This report summarizes my findings regarding the ambient noise levels measured at two selected locations in your neighborhood during the October 20, 2012 varsity football game between Blanchet and Eastside Catholic. The purpose of the measurements was to determine if the noise levels generated by the activities at the football stadium exceed the maximum allowable noise levels specified in the Seattle Noise Ordinance as codified in Chapter 25.08 of the Seattle Municipal Code. According to that ordinance, the maximum allowable noise level generated between residentially zoned properties within the city limits (as is the case with Blanchet High School and your neighborhood) is an average noise level (Leq) of 55 dBA and a maximum (Lmax) noise level of 70 dBA during the daytime hours (7 AM to 10 PM). I should point out that during nighttime hours (10 PM to 7 AM) the maximum allowable noise level is 10 dBA lower than the corresponding daytime noise levels.

Ambient noise measurements were conducted from 12:00 noon until 3:00 pm on October 20, 2012 at two locations shown in Photo 1, which is an aerial view of a portion of your neighborhood and the football stadium. Position 1 was in the center of the back yard of the home at 8219 Meridian Avenue North, and Position 2 was half-way between the sidewalk and the street curb in front of the residence at 8226 Meridian Avenue North. The microphone (with protective windscreen) was placed 5 feet above existing grade at each measurement location. The Position 1 instrument was a Bruel & Kjaer model 2270 precision integrating sound level meter, and the Position 2 instrument was a Bruel & Kjaer model 2238 precision integrating sound level meter. Both instruments are ANSI S1.4 Type 1 sound level meters, and both instruments were time synchronized in time and calibrated before the start of the measurements with the same Bruel & Kjaer model 4230 portable acoustic calibrator. Both instruments were programmed to log the 1-second average (Leq) and maximum (Lmax, with fast response time) sound levels for the entire measurement period.



Figures 1, 2, and 3 present the measured A-weighted sound pressure levels recorded at Position 1, each graph covering a 1-hour time period (except for Figure 1 which starts at 12:15 PM and continues until the 1:00 PM game start time). Significant individual events are marked on the graph. The loudest sounds are typically associated with cheers from the team players (as they warm up prior to the game) and from the crowd (during the game). Cheers from both the team and the crowd exceeded the 70 dBA L<sub>max</sub> threshold at Position 1 numerous times during the measurements. During the 3 hour measurement, the 1-second Leq was greater than 70 dBA for a total of 388 seconds, or 3.6% of the time. The loudest event recorded at Position 1 was the crowd cheer at 1:42:47 PM which measured 81.2 dBA. The average (Leq) sound level at Position 1 during the first hour of the game was 65.3 dBA and the average (Leq) sound level during the second hour of the game (which included halftime activities) was 63.9 dBA.

Figures 4, 5, and 6 present the measured A-weighted sound pressure levels recorded at Position 2, each graph covering a full 1-hour time period. Again, the loudest sounds are associated with cheers from the crowd during the game. During the 3 hour measurement, the 1-second Leq was greater than 70 dBA for a total of 221 seconds, or 2.0% of the time. At this location there are also additional events caused by cars driving down Meridian Avenue North or cars parking on the street, but the number of vehicles is very low (ranging between 0.6 and 0.75 cars/minute) and the vehicle speed is also low, so in most cases the car noise is not significant. Between 12:20 PM and 1:00 PM there were 25 cars, from 1 PM until 2 PM there were 36 cars, and from 2 PM until 2:45 PM there were 34 cars passing by on the street. The highest sound level recorded at Position 2 was 79.7 dBA at 2:33:42 PM caused by a speeding car on Meridian Avenue North while the marching drum corps was playing at halftime. The average (Leq) sound level at Position 2 during the first hour of the game was 61.8 dBA and the average (Leq) sound level during the second hour of the game (which included halftime activities) was 61.1 dBA.

Figure 7 presents a comparison of the two measurement locations from 1:10 PM until 1:20 PM, starting just prior to Eastside Catholic's first touchdown. Here you can see the correlation between the noise levels at the two measurement locations. The first touchdown occurred in the south end zone, close to Position 1. Blanchet's initial first down occurred just after 1:17 PM closer to the middle of the field, which elicited a loud cheer from the crowd. Also visible in Figure 7 are a few isolated peaks at Position 2 (the black curve) that do not appear at Position 1 (the red curve). These are peaks associated with cars driving by the Position 2 microphone. Most of these vehicle peaks are less than 70 dBA, but there was one noisy southbound car at 1:19:32 that reached 71.8 dBA.



Table 1 presents a summary of the pertinent statistics associated with these ambient noise measurements. As you can see, all of the measured sound levels are well above the maximum allowed 55 dBA hourly Leq permitted by the noise ordinance.

Table 1. Hourly average (Leq) sound level statistics (dBA)

Measurement (time)	Game Activity	Position 1	Position 2
Leq (12-1 PM)	Pre-game warm-up	60.2	59.0
Leq (1-2 PM)	First Half Action	65.3	61.8
Leq (2-3 PM)	First Half & Halftime Activities	63.9	61.1
Leq (12:51 PM)	Non-Football Ambient	52.3	51.5
Corrected Leq* (12-1 PM)	Pre-game warm-up	59.4	58.1
Corrected Leq* (1-2 PM)	First Half Action	65.1	61.4
Corrected Leq* (2-3 PM)	First Half & Halftime Activities	63.6	60.6
Corrected Leq** (1-2 PM)	First Half Action	63.7	58.6
Corrected Leq** (2-3 PM)	First Half & Halftime Activities	61.5	56.9

\* corrected to non-football ambient noise level at 12:51 PM

\*\* corrected to pre-game warm up ambient noise level from 12 PM to 1 PM

I also took the opportunity to evaluate the noise levels associated with the public address system at Positions 1 and 2. I understand that to be in compliance with the conditions of the MUP, the public address system sound level must not exceed 55 dBA (Leq averaged over 15 seconds) at the neighboring properties. I was able to measure the PA system sound levels for 15 seconds beginning at 12:56 PM during the introduction of the starting lineups just prior to the start of the game. At Position 1 the 15-second Leq was 59.2 dBA. I also measured the ambient noise level at Position 1 during the pre-game prayer (48.4 dBA). The ambient corrected PA system sound level at Position 1 is therefore 58.8 dBA. Table 2 summarizes the 15-second average (Leq) sound level statistics associated with the PA system at both measurement locations. As you can see, the sound levels recorded at Position 1 exceed the MUP limit by 3.8 dBA, but at Position 2 the PA system is 0.6 dBA below the specified limit.

Table 2. 15-second average (Leq) sound level statistics for PA system (dBA)

Noise Level Statistic	Game Activity	Position 1	Position 2
Leq (12:56 PM)	Announce starting lineups	59.2	56.6
Leq (12:57:45 PM)	Pause before pre-game prayer	48.4	52.7
Corrected Leq* (12:56 PM)	Announce starting lineups	58.8	54.4

\* corrected to pause before pre-game prayer at 12:57:45 PM



*Summary and Conclusions*

The results of this study confirm that the noise from the activities at this Blanchet High School football game significantly exceed the allowable sound levels presented in Chapter 25.08.410 of the Seattle Municipal Code. Hourly average sound levels at Position 1 exceed the 55 dBA limit by 6.5 to 10.1 dBA, depending upon which hour of the game you look at and which ambient noise level you use for correcting the measurements. At Position 2 the 55 dBA limit is exceeded by 1.9 to 6.4 dBA, depending upon which hour of the game you look at and which ambient noise level you use for correcting the measurements. In addition, the 70 dBA Lmax limit was exceeded for 388 seconds at Position 1 and 221 seconds at Position 2 during the 3-hour measurement. Finally, the PA system noise levels are in compliance with the MUP limits at Position 2, but exceed those limits at Position 1 by 3.8 dBA.

If you have any questions regarding these findings and conclusions, do not hesitate to give me a call.

Very truly yours,  
JGL Acoustics, Inc,

A handwritten signature in black ink that reads "Jerry G. Lilly".

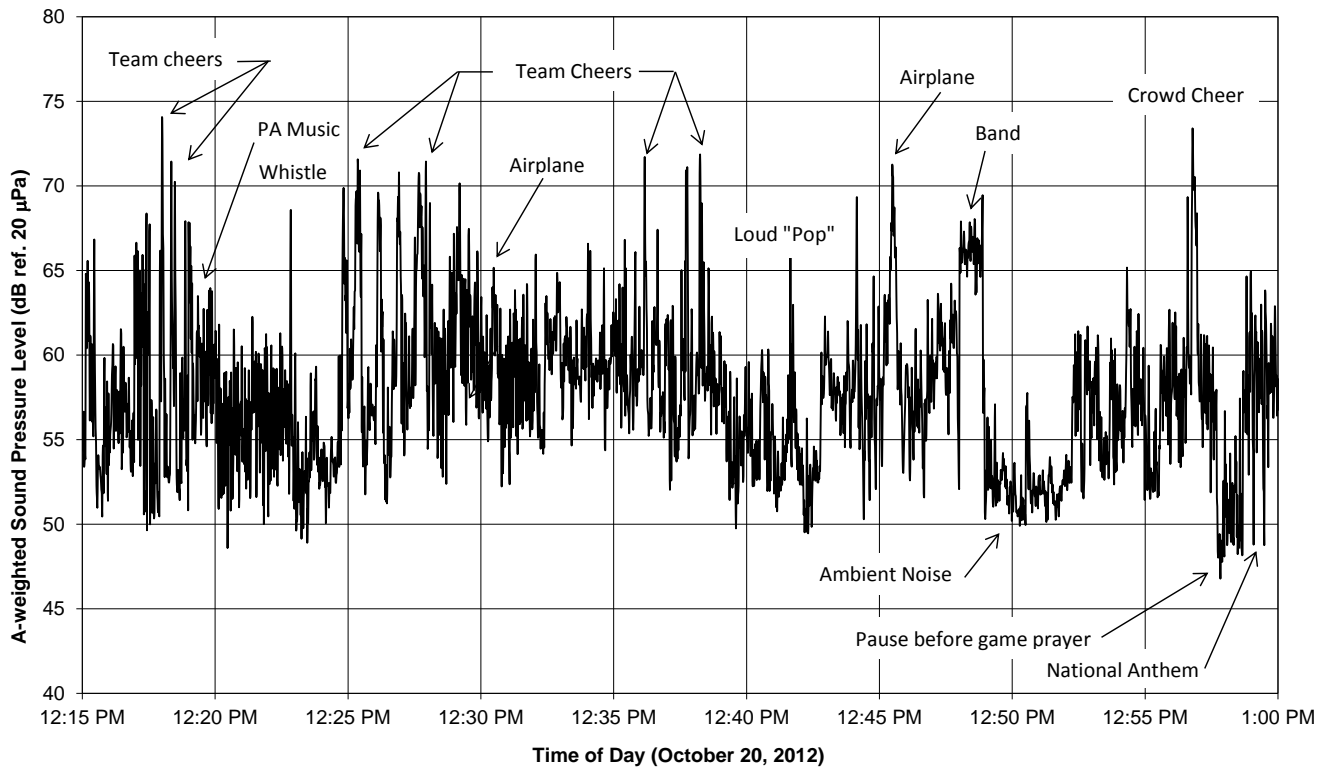
Jerry G. Lilly, P.E., President, FASA  
Member INCE, ASTM, NCAC



Photo 1. Aerial view showing noise measurement locations.

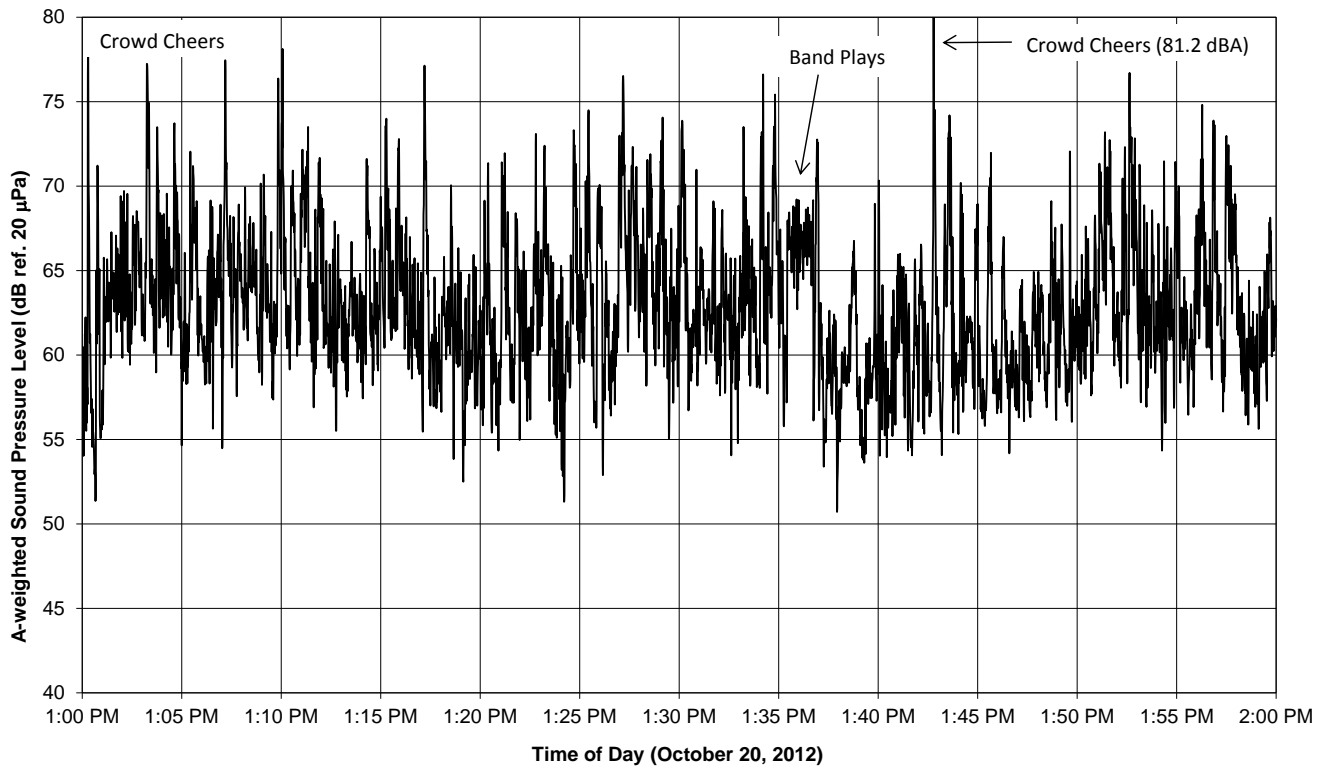


**Blanchet High School Football Game**  
**Figure 1. Ambient noise at Position 1 prior to start of game**



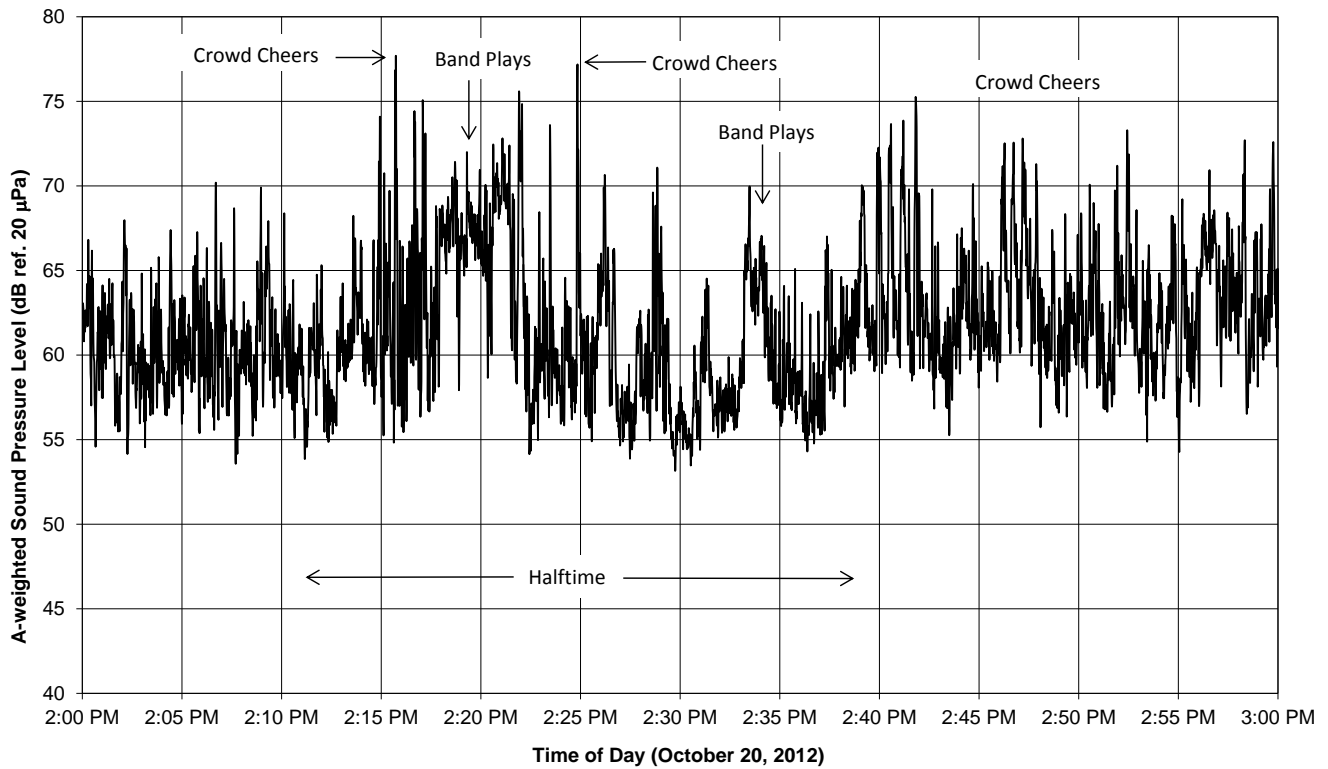


**Blanchet High School Football Game**  
**Figure 2. Ambient noise at Position 1 during football game**





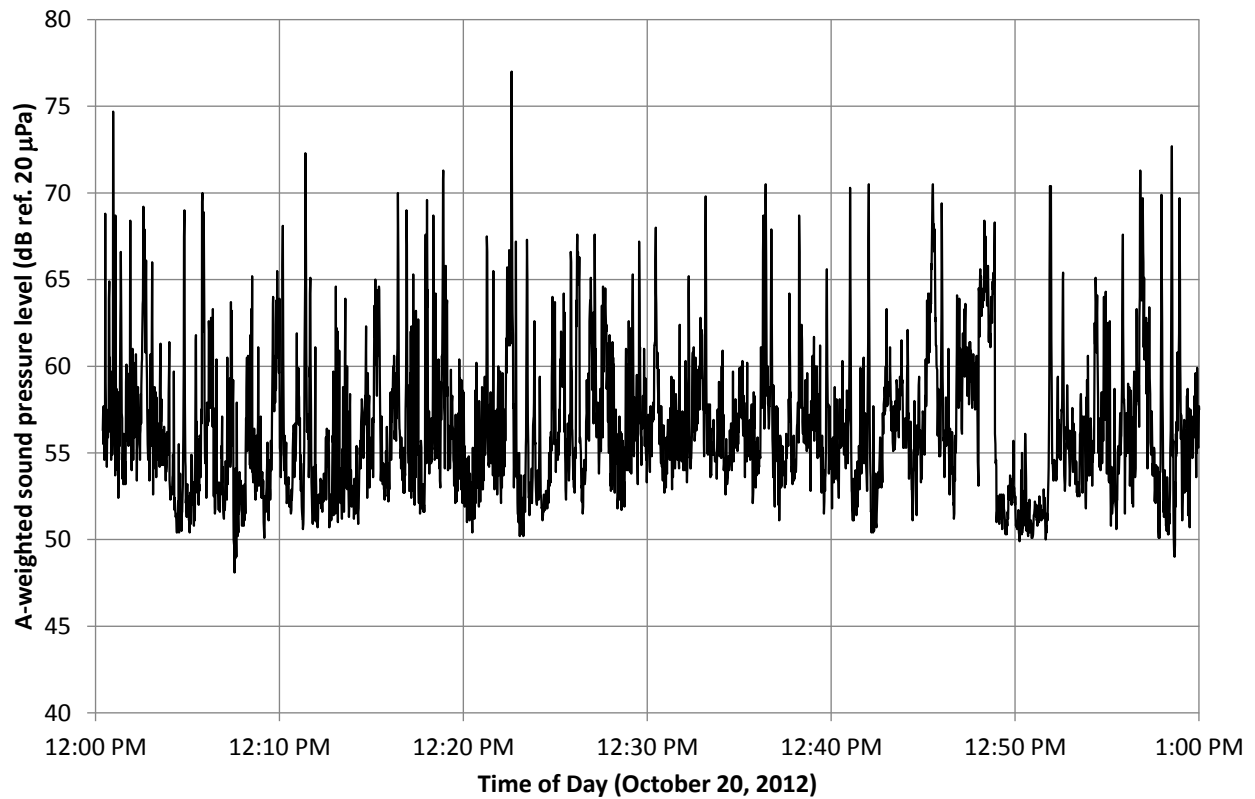
**Blanchet High School Football Game**  
**Figure 3. Ambient noise at Position 1 during football game**





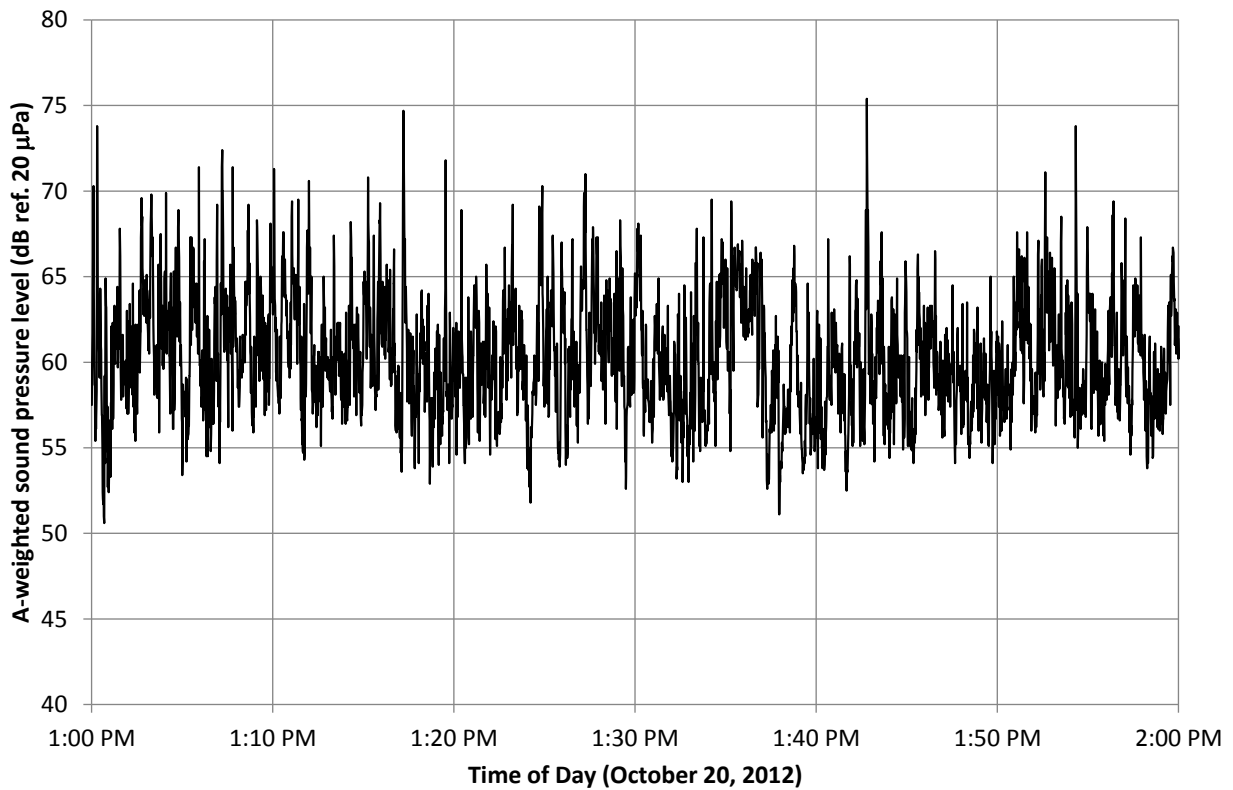


**Blanchet High School Football Game**  
**Figure 4. Ambient noise before game at Position 2**



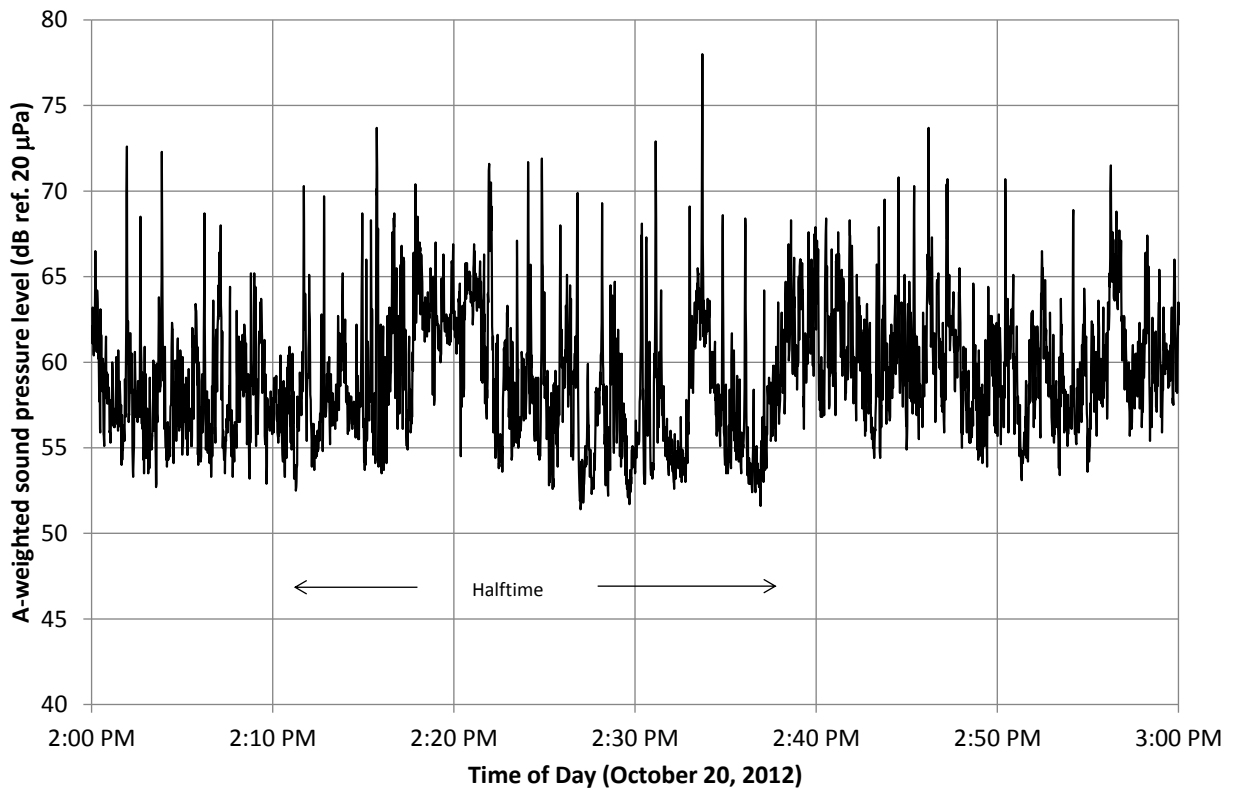


**Blanchet High School Football Game**  
**Figure 5. Ambient noise during game at Position 2**





**Blanchet High School Football Game**  
**Figure 6. Ambient noise during game at Position 2**





**Blanchet High School Football Game**  
**Figure 7. Ambient noise during game at Positions 1 and 2**

