

# **SOUND LEVEL ASSESSMENT**

**Animal Inn**

**Lake Elmo, Minnesota**

**Prepared for**

**Animal Inn**

**by**

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**7 August 1999**

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## 1.0 INTRODUCTION AND STUDY OBJECTIVES

This report describes the methodology and findings from a monitoring program to establish sound levels associated with Animal Inn in Lake Elmo, Minnesota. The study was undertaken in response to reports from a nearby residential neighborhood of hearing dogs from the outdoor kennel at Animal Inn.

The sound level monitoring program reported on here was developed to identify sound levels associated with the kennel and sound levels observed in the neighborhood, and to determine what impact, if any, kennel sound has on the adjacent neighborhood.

To accomplish this, sound level meters were placed adjacent to the kennel and in a representative location in the neighborhood. Sound levels were monitored for just over one hour which included the time during which dogs were moved into the outdoor kennel area at 7:00 am. The data collected permitted a comparison of sound levels at and between these two locations.

## 2.0 NOISE MONITORING RESULTS

### 2.1 Monitoring Sites and Time

Sound levels were monitored 15 feet behind the kennel (to represent source noise) and at the intersection of 27th and Innsdale which is approximately 3000 feet to the south of Animal Inn. The 27th and Innsdale site was selected as being representative of the residential neighborhood where reports of hearing sounds from Animal Inn have originated.

Sound levels were monitored beginning at 6:30 am on Saturday 24 July 1999 at the Kennel. This time was selected since the dogs are released to the outdoor kennels at 7:00 am and the difference between ambient and post-7 am sound levels could be determined. Saturday morning was selected since this represents a worst case for the kennel and a relatively quiet background noise period for the adjacent neighborhood. Sound levels were monitored and averaged over 1-minute intervals to provide a detailed picture of sound levels during the monitoring period.

The location of Animal Inn and sound monitoring sites is shown in **Exhibit 2.1**. It can be seen that the monitoring site is approximately 3000 feet from Animal Inn. Other noise sources including the Chicago Northwestern Railroad, Stillwater Boulevard, and Inwood Avenue North lie between the monitoring site and Animal Inn.

Reported weather conditions during the monitoring period are indicated below.

Sky	Partly cloudy
Temperature	83°
Dew Point	74°
Relative Humidity	74%
Wind	West 7 mph
Pressure	29.94 rising

With the wind perpendicular to the sound path between the monitoring site and Animal Inn, wind had a minimal effect on the observed sound levels.

### 2.2 Monitoring Results and Comparisons

Monitoring results are presented graphically in **Exhibit 2.2** through **Exhibit 2.6**.

#### **Exhibit 2.2 One-Minute Average Sound Levels at Animal Inn**

In this and the following exhibit, the L01 represents the level for 1% of a minute or 0.6 seconds. L10 represents the level for 10% of a minute or 6 seconds. L50 represents the level for 50% of a minute or 30 seconds. L90 represents the level for 90% of a minute or 54 seconds.

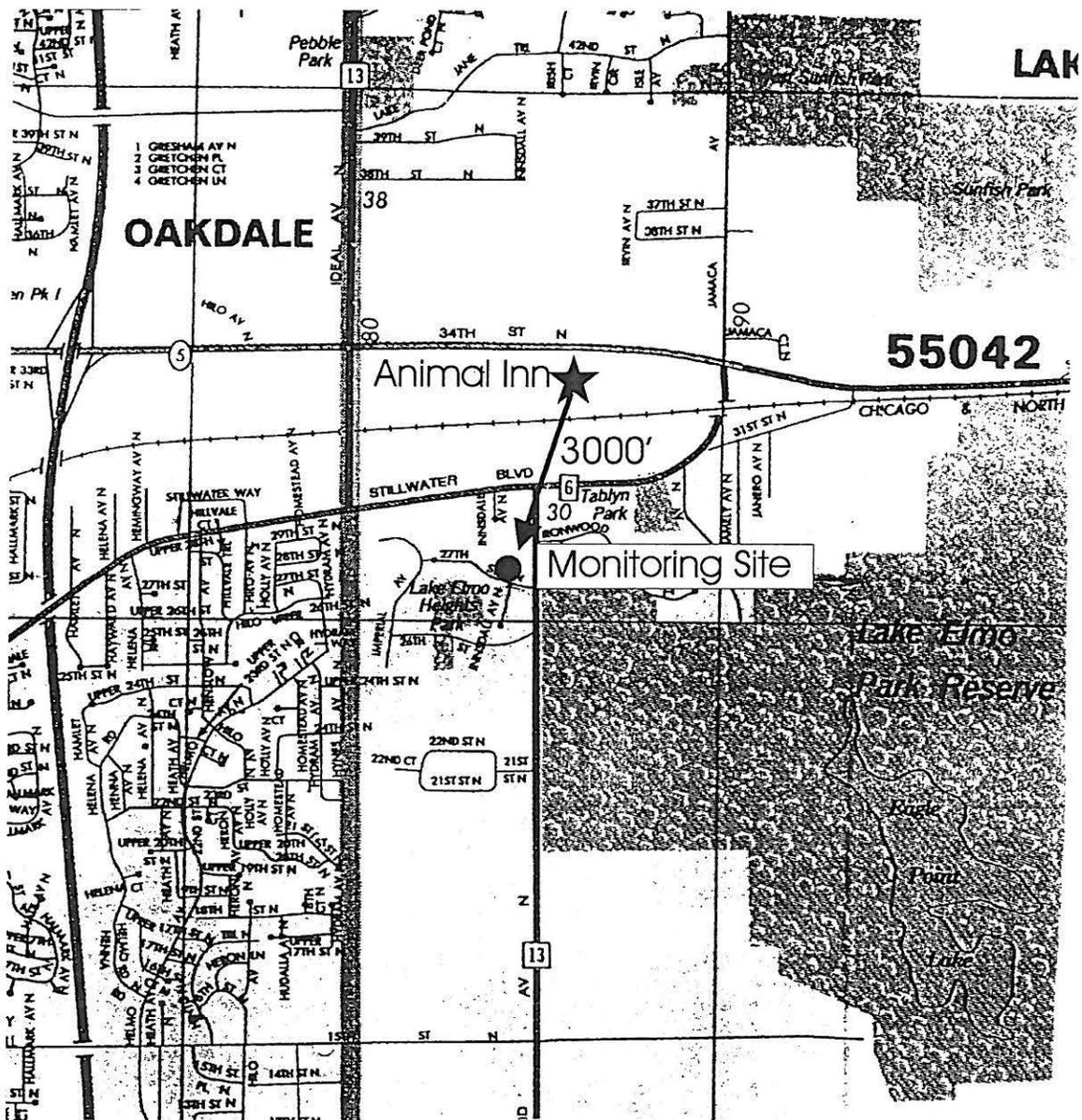


Exhibit 2.1  
Animal Inn and Noise Monitoring Locations

This exhibit clearly shows an increase in sound level as the dogs were let into the outdoor kennels at 7:00 am. Prior to 7:00 am some individual dogs were outside as can be seen from the shorter episodes of sound level up to 60 dBA. After 7:00 am, the maximum observed level 69 dBA and relatively continuous until approximately 7:30 am when the sound level began to decrease.

### **Exhibit 2.3 One-Minute Average Sound Levels at 27th and Innsdale**

This exhibit shows a general background level of around 48 dBA prior to 7:00 am and some peaks as high as 62 dBA after 7:00 am. Most of these peaks were caused by cars passing on 27th Street, with several of the peaks due to barking dogs at nearby residences. The L50 level, which increased by approximately 6 dBA at the kennel after 7:00 am, showed several peaks at this location but generally remained around 45 dBA during the time period. Comparisons between the levels observed at the kennel and at this location are presented in the three exhibits described below.

### **Exhibit 2.4 Comparison of L01 Levels**

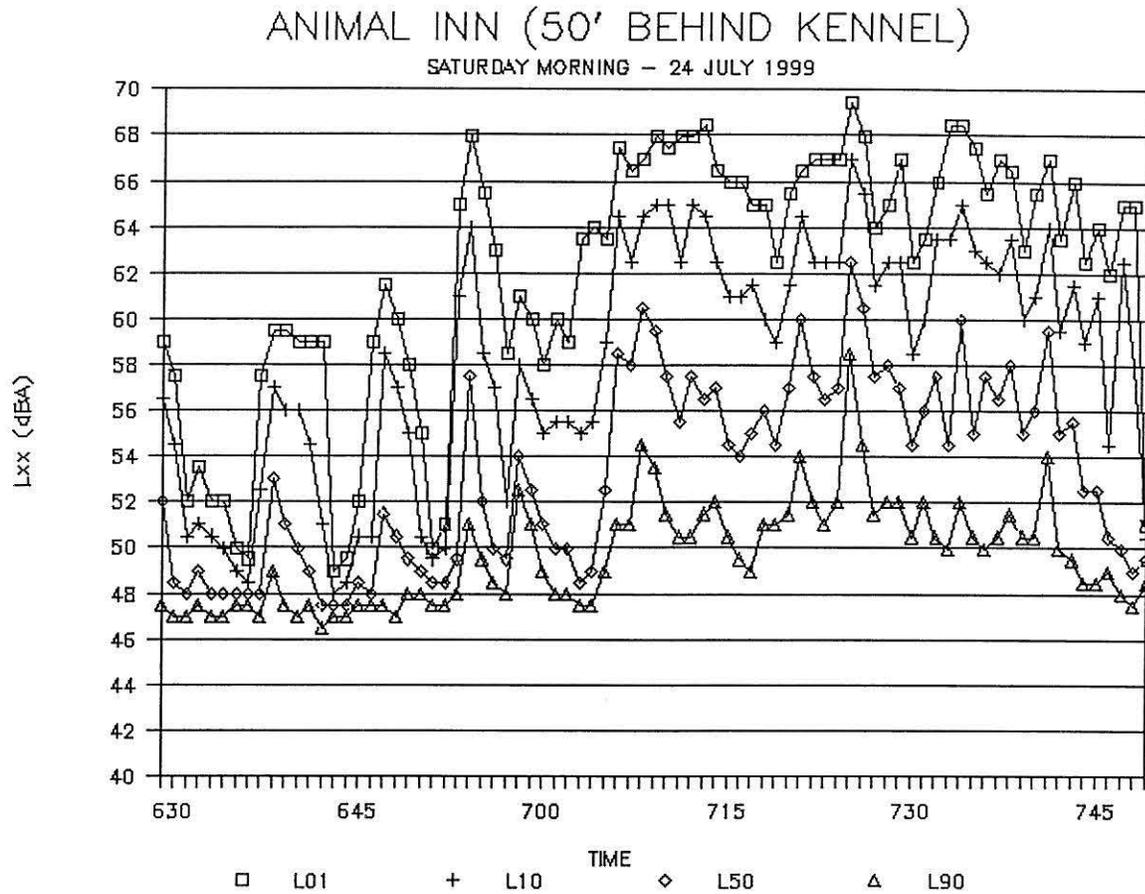
This exhibit shows the L01 or "peak" sound levels during each minute. It can be seen that when the kennel sound level increased at 7:00 am, no similar change occurred in the neighborhood. There was an increase in individual events primarily from the passage of automobiles and several aircraft after 7:15 am.

### **Exhibit 2.5 Comparison of L10 Levels**

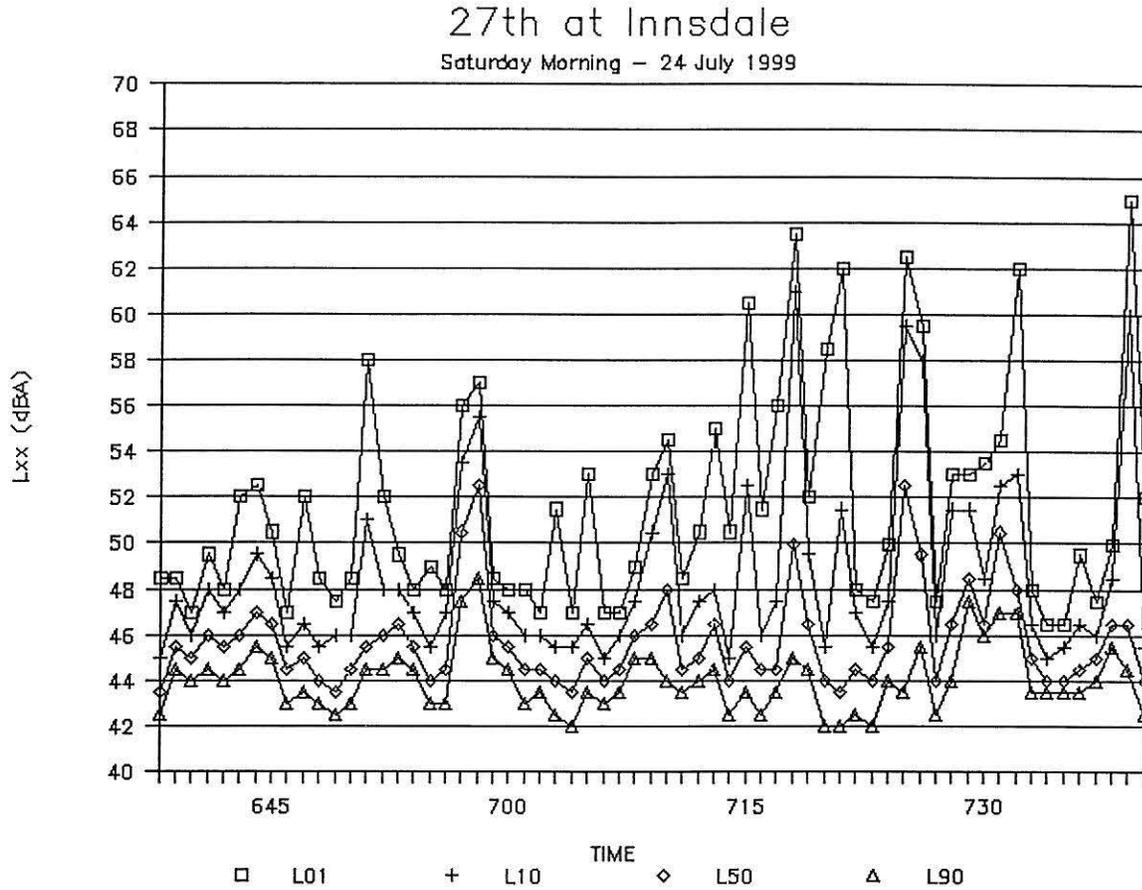
This exhibit shows the L10 sound levels during each minute. While the L10 level increased at 7:00 am at the kennel, there was no similar increase in the neighborhood. Only isolated peaks associated with automobiles or aircraft were observed.

### **Exhibit 2.6 Comparison of L50 Levels**

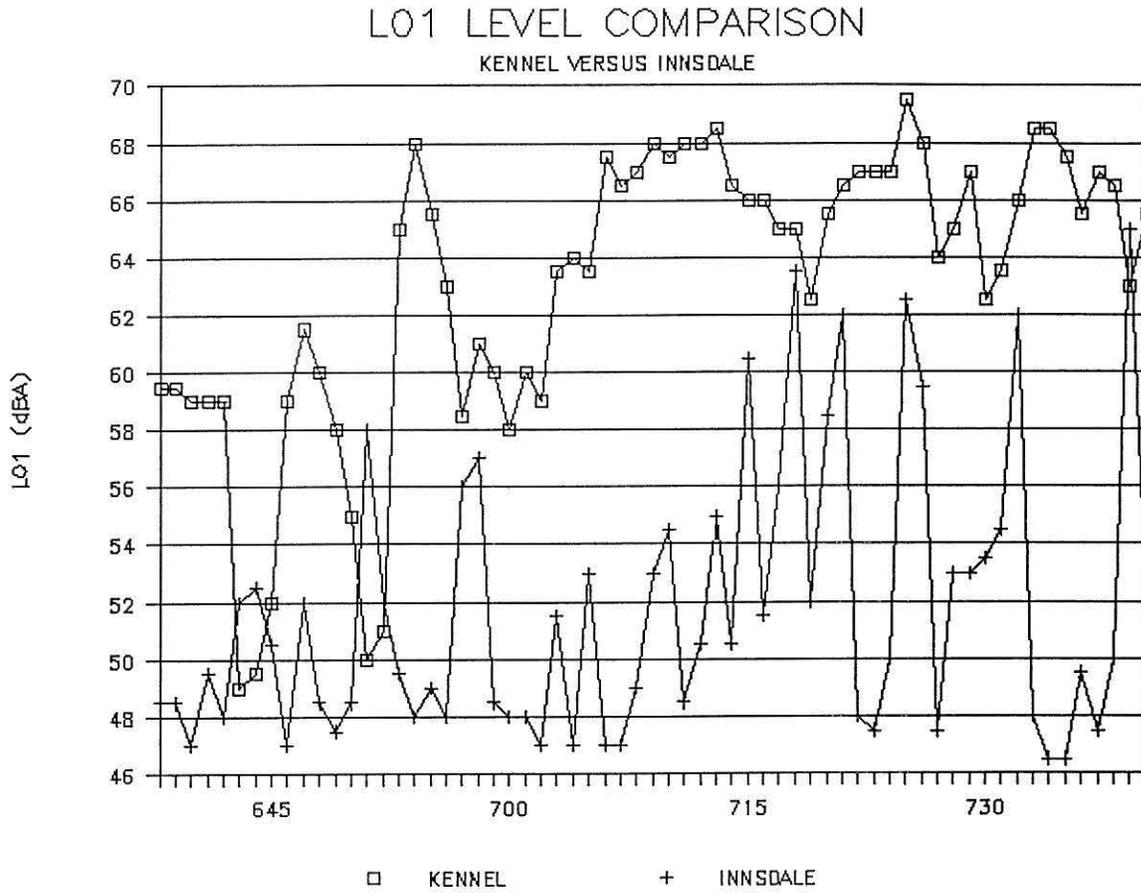
This exhibit shows the L10 or median sound level during each minute. While there was a clear increase in level at the kennel after 7:00 am, no similar increase occurred in the neighborhood. The large peak at 7:26 am was observed in the neighborhood to be an aircraft overflight. This peak can also be seen in the L01 data in **Exhibit 2.4**.



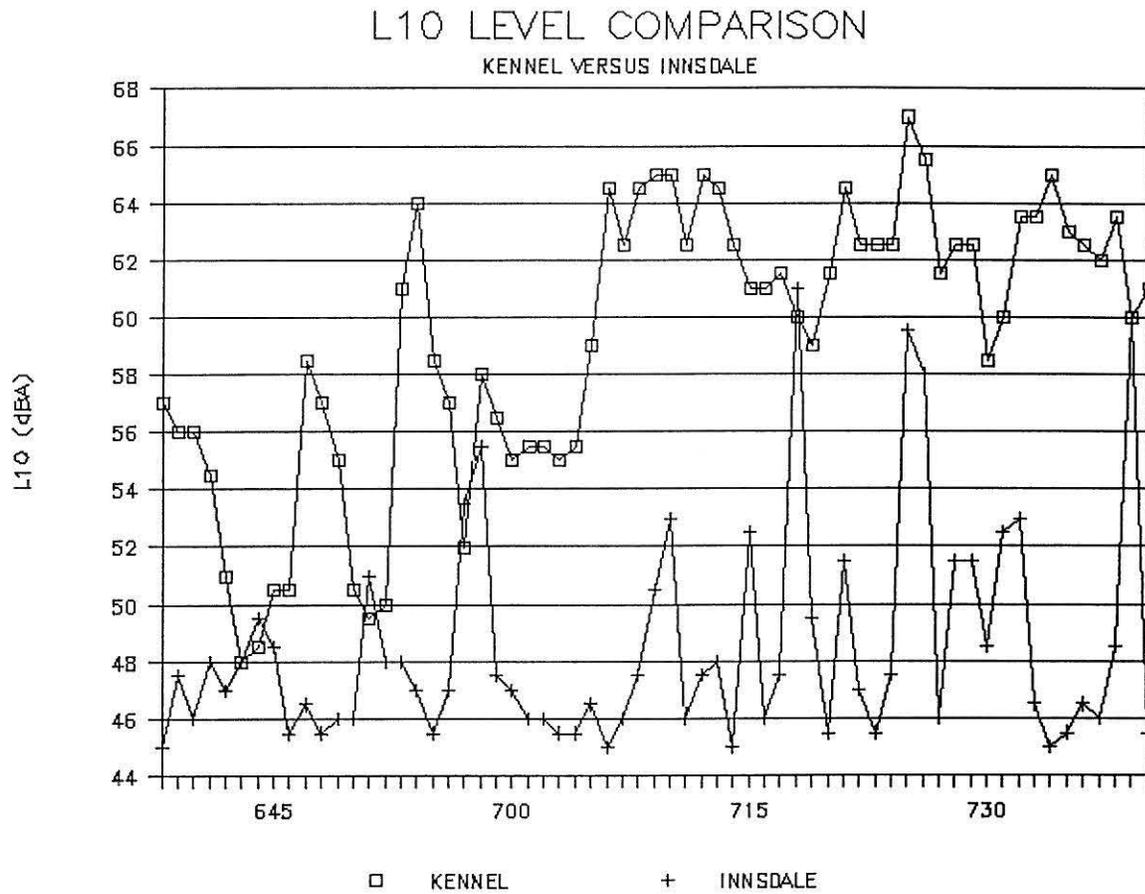
**Exhibit 2.2**  
**One-Minute Average Sound Levels at Animal Inn**



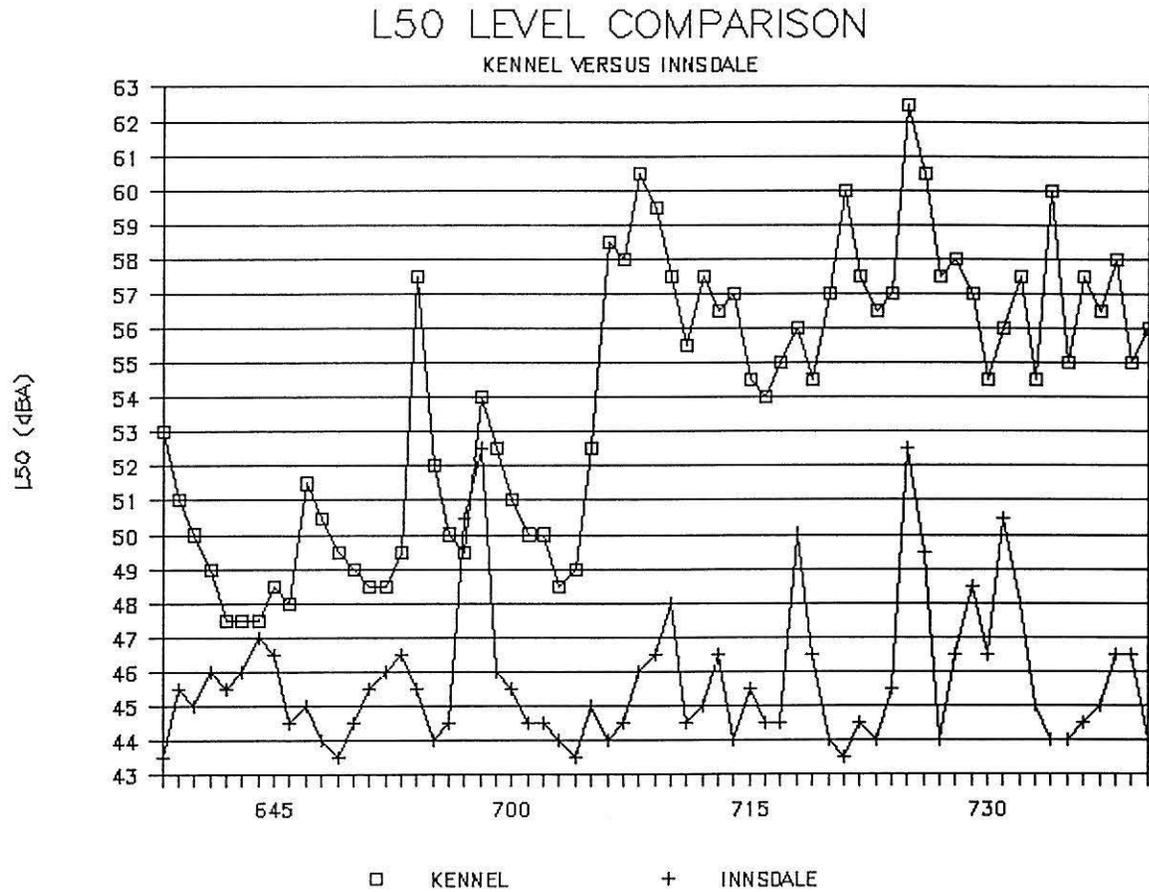
**Exhibit 2.3**  
**One-Minute Average Sound Levels at 27th and Innsdale**



**Exhibit 2.4**  
**Comparison of L01 Levels**



**Exhibit 2.5**  
**Comparison of L10 Levels**



**Exhibit 2.6**  
**Comparison of L50 Levels**

### 2.3 Comparison with MPCA Noise Standards

Because of its periodic nature, kennel sound levels are governed by the L10 sound level as defined in Minnesota regulations. The L10 is the level exceeded 10% or six minutes of an hour. The state noise standards for residential land uses expressed as L10 are presented in **Table 2.1**.

**Table 2.1**  
**Minnesota L10 Noise Standards for Residential Land Uses**

<b>Daytime</b>	<b>Nighttime</b>
7 am to 10 pm	10 pm to 7 am
65 dBA	55 dBA

The L10 sound level measured 50 feet from the kennel did not exceed the daytime (after 7:00 am) standard (except for the aircraft overflight at 7:26 am). Therefore, as long as the dogs are not outside between 10:00 pm and 7:00 am, the state noise standards are not likely to be exceeded even at the property line of Animal Inn.

Sound levels measured in the neighborhood are well below the daytime noise standards.

### 3.0 FINDINGS AND CONCLUSIONS

#### 3.1 Monitored Data

Based upon monitored sound levels, there is no evidence that sound from the kennel has an effect on levels in the neighborhood near 27th Street and Innsdale Avenue. When the dogs were placed in the outdoor kennels at 7:00 am, the maximum level (L01) increased over background by as much as 18 dBA. The L10 level increased by approximately 18 dBA over background. At the neighborhood monitoring site, the L01 did not increase except due to nearby passing automobiles. The L10 level also did not increase except due to nearby passing automobiles.

#### 3.2 Predicted Sound Levels

As a means of confirming the measurements, a prediction of sound level at the monitor was made using the decay of sound with distance. No attenuation from vegetation was assumed. The 68 dBA peak level at the kennel is predicted to drop to 32 dBA at the monitor. At homes along Stillwater Boulevard, the levels are predicted to drop to 38 dBA. Even with a wind blowing directly from the kennel, these levels are likely to be no higher than 42 dBA in the neighborhood and 48 dBA along Stillwater Boulevard. The 48 dBA level is similar to the lowest observed L01 levels in the neighborhood. Noise from traffic is likely to be higher than 48 dBA along Stillwater Boulevard.

#### 3.3 Potential for Sound Level Impact

Sound levels associated with the kennels at Animal Inn are not likely to exceed the MPCA daytime standards at the Animal Inn property line. These levels are not likely to show up on sound level measurements made in the neighborhood near 27th Street and Innsdale Avenue. Some sounds may be audible even when the measured sound level is lower than measured ambient levels, which may be the case with the sound of barking dogs from the kennel. However, audibility of sounds at or below ambient levels is not considered in the state noise standards nor in local noise ordinances.

Based upon this sound level assessment, sound levels from Animal Inn do not exceed any established noise standards nor are they likely to significantly affect typical ambient sound levels that already exist in adjacent residential neighborhoods.

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