August 26, 2003

Mr. Gary Ehret, PE
Kimley-Horn and Associates, Inc.
2550 University Avenue West Suite 345N
St. Paul, MN 55114-2006

Re: Traffic Noise and Air Quality Study for Chanhassen, MN AUAR

Dear Gary:

Thank you for the opportunity to perform a traffic noise and air quality analyses for the Chanhassen AUAR project. The following text presents results of our analyses.

NOISE ANALYSIS

Introduction

HDR Engineering, Inc. (HDR) measured existing noise levels at three locations in the project area. Monitoring locations represented undeveloped land that is likely to be developed for residential use. HDR modeled the future Build alternative and traffic volumes for the year 2025, using the Minnesota Department of Transportation traffic noise model, MINNOISE. Monitoring data and modeling results were compared with the Minnesota Pollution Control Agency (MPCA) Noise Rules, and traffic noise impacts were evaluated. Modeling results were used to create noise contours showing the location of the residential daytime and nighttime L10 and L50 noise contour lines. Project location maps are included as Figures 1 and 2 at the end of this report.

Existing Noise Levels

On August 20 and 22, 2003, HDR performed noise monitoring at three locations in the project area. The purpose of the noise monitoring was to document existing noise levels. Noise measurements were conducted in accordance with Minnesota Rules Chapter 7030, Noise Pollution Control.

The average meteorological conditions were reported as shown in Table 1 below.

Table 1
Meteorological Conditions for August 20 & 22, 2003

Temperature	8/20/03 - 94°, 8/22/03 – 61°
Humidity	8/20/03 ≅ 47%, 8/22/03 ≅ 93%
Wind	8/20/03 breezy; 8/22/03 N/A
Conditions	Partly Cloudy
Barometric Pressure	8/20/03 – 29.71 inches; 8/22/03 – 30.12 inches

The microphones were covered with a windscreen and when placed on a tripod, were set to a height of approximately 5 feet for all measurements. The Sound Level Meters (SLM) were calibrated before and after the monitoring activities. No significant calibration drifts were detected during the monitoring events. Table 2 summarizes the equipment HDR staff used to collect monitoring data for this noise analysis.

Table 2
Noise Analysis Instrumentation Summary

Instrument	Make	Model	Calibration Due	Serial Number
Sound Level Meter	Quest Technologies	2900 Sound Level Meter with Octave Band Filter	June 20, 2004	HV7120016
Calibrator	Quest Technologies	QC-10/QC-20	June 20, 2004	QE7120219
Sound Level Meter	Larson Davis	712	November 22, 2003	0315
Calibrator	Larson Davis	CAL150	November 22, 2003	0421

The monitoring sites were selected at locations to get a representation of the noise emissions from the existing roadways (Audubon Road, Lyman Boulevard). Site 1 was located approximately 81 feet from the Audubon Road centerline, close to where the intersection with the East-West collector will be. Site 2 was located approximately 62 feet from the Lyman Boulevard centerline, near the intersection with Audubon Road. Site 3 was located approximately 81 feet from Lyman Boulevard, near where the North Collector will intersect Lyman Boulevard.

The results are listed in Tables 3 (daytime) and 4 (nighttime) below and the locations are indicated on Figures 1 and 2. Daytime means those hours from 7:00 a.m. to 10:00 p.m. Nighttime means those hours from 10:00 p.m. to 7:00 a.m. MPCA maximum allowable daytime noise levels are 65 dBA (L10) and 60 dBA (L50), and nighttime noise levels are 55 dBA (L10) and 50 dBA (L50).

Table 3
Daytime Noise Monitoring Summary

Site	**Date Sampled**	**Time Sampled**	**Distance From CL**	**L10 (dBA)**	**L50 (dBA)**	**MPCA Daytime**		**Exceedance (Yes/No)**
						L10 (dBA)	**L50 (dBA)**	
1	August 20, 2003	4:00-5:00 p.m.	≈ 81’	67	62	65	60	Yes
2	August 20, 2003	4:08-5:08 p.m.	≈ 62’	66	60	65	60	Yes
3	August 20, 2003	5:05-6:05 p.m.	≈ 81’	73	64	65	60	Yes

Table 4
Nighttime Noise Monitoring Summary

Site	Date Sampled	Time Sampled	Distance From CL	L10 (dBA)	L50 (dBA)	MPCA Nighttime		Exceedance (Yes/No)
						L10 (dBA)	L50 (dBA)	
1	August 22, 2003	4:57-5:57 a.m.	≈ 81'	73	64	55	50	Yes
2	August 22, 2003	5:57-6:57 a.m.	≈ 62'	69	62	55	50	Yes
3	August 22, 2003	6:00-7:00 a.m.	≈ 81'	65	59	55	50	Yes

None of the sites monitored are developed. Both daytime and nighttime noise levels exceed MPCA Standards. Monitoring was done during morning and evening rush hour with heavy traffic traveling at approximately 50 mph and at locations within 81 feet of the roadway centerline.

Future Noise Levels

The modeling analysis utilized proposed roadway design details and traffic information supplied by Kimley-Horn and Associates, Inc. HDR loaded a digital plan view of the proposed roadway into Arcview, a geographic information system (GIS) program and digitized roadway coordinates for use in the MINNOISE input file. Audubon Road, Lyman Boulevard, North Collector, South Collector, and East-West Collector were digitized and modeled for the Build Alternative.

The analysis modeled peak hour projected traffic volumes for the year 2025. The peak hourly traffic volumes (PHV) of the various locations are shown in Table 5.

Roadway speeds were modeled as follows:

- Audubon Road - 50 mph
- Lyman Boulevard - 50 mph
- North Collector - 40 mph
- South Collector - 40 mph
- East-West Collector - 45 mph

Table 5 **Peak Hourly Traffic Volumes (Build Condition)**		
Location	***Design (2025)***	***Design (2025)***
	Daytime PHV	*Nighttime PHV*
Audubon Road		
Pioneer Trail to Butternut Dr.	1094	300
Butternut Dr. to Lakeview	1105	309
Lakeview to Lyman	1005	281
Lyman Boulevard		
Audubon to Audubon N.	1595	447
Audubon N. to N. Collector	1449	406
N. Collector to Powers	1544	432
East-West Collector		
Audubon to S. Collector	934	262
S. Collector to N. Collector	815	228
N. Collector to Powers	1138	319
North Collector		
	160	45
South Collector		
	239	67
Pioneer Trail		
Audubon to S. Collector	1264	354
S. Collector to Bluff Creek	1561	437
Bluff Creek to Powers	1186	332

Table 6 shows the vehicle mix provided by Kimley-Horn and Associates, Inc. that was used in this traffic noise analysis.

Table 6 **Vehicle mix used for Chanhassen AUAR**		
Autos	**MT**	**HT**
98%	0	2%

Results

Modeling results are shown as contours on Figures 1 and 2. Traffic noise levels between the roadway and contour line are predicted to exceed the corresponding Residential Daytime/Nighttime L10/L50 noise levels. Table 7 shows these distances in tabular form.

Table 7 **Distance to Contours – Build Condition (2025)**				
Location	**Approximate Distance from CL in Feet**			
	MPCA Daytime		**MPCA Nighttime**	
	L10 (dBA)	**L50 (dBA)**	**L10 (dBA)**	**L50 (dBA)**
Audubon Road				
Pioneer Trail to Butternut Dr.	134	119	325	187
Butternut Dr. to Lakeview	176	121	319	205
Lakeview to Lyman	164	91	314	180
Lyman Boulevard				
Audubon to Audubon N.	171	150	330	245
Audubon N. to N. Collector	161	150	321	247
N. Collector to Powers	165	175	345	275
East-West Collector				
Audubon to S. Collector	75	75	200	75
S. Collector to N. Collector	125	82	224	100
N. Collector to Powers	145	96	243	150
North Collector				
	40	40	45	40
South Collector				
	65	35	55	40

Residences located within the distances above (from the roadway centerline) are predicted to experience roadway noise levels that may exceed the MPCA's maximum allowable noise levels.

Predicted future noise levels at the monitoring locations are shown in Tables 8 and 9 below.

Table 8 Daytime Noise Modeling Results at Monitoring Locations					
Site	L10 (dBA)	L50 (dBA)	MPCA Daytime Limits		Exceedance (Yes/No)
			L10 (dBA)	L50 (dBA)	
1	69	62	65	60	Yes
2	72	65	65	60	Yes
3	70	63	65	60	Yes

Table 9 Nighttime Noise Modeling Results at Monitoring Locations					
Site	L10 (dBA)	L50 (dBA)	MPCA Nightime Limits		Exceedance (Yes/No)
			L10 (dBA)	L50 (dBA)	
1	64	54	55	50	Yes
2	66	57	55	50	Yes
3	64	55	55	50	Yes

Both daytime and nighttime future (2025) build modeling results indicate that future traffic noise levels may exceed MPCA maximum allowable noise levels at the monitoring locations. This is reasonable because these locations lie within the noise contour lines shown in Figures 1 and 2.

The proposed Highway 212/312 alignment and its ramps were modeled for a previous environmental review document. The proposed highway and its ramps are not a feature of this project and are therefore not included in this analysis. Interested readers should obtain and review the environmental document prepared in support of the proposed highway for information about predicted noise levels associated with those roadways.

Mitigation

Results of these analyses suggest that future traffic noise levels may exceed MPCA's maximum allowable noise levels near roadways in the project area. The City of Chanhassen is required to comply with MN Rules section 7030.0030. This section requires the City to ensure that existing noise levels comply with state noise limits prior to occupants moving into residences in the proposed development. Traffic noise levels may be reduced by a combination of earthen berms and aesthetically designed noise walls that fit the theme of the proposed development. More detailed noise analyses should be performed for each specific development proposed for the project area.

AIR QUALITY

Existing Conditions

Most of the Chanhassen area, located in northeastern Carver County, is only lightly developed with industrial, commercial, or residential developments. Monitored concentrations for pollutants subject to National Ambient Air Quality Standards (NAAQS – see 40 CFR 50) are

not available based on a check of the US Environmental Protection Agency's (EPA's) online AIRS database. These pollutants include carbon monoxide (CO), lead (Pb), nitrogen oxides (NO_x), ozone (O_3), particulate matter under 10 microns in diameter (PM_{10}), particles under 2.5 microns in diameter ($PM_{2.5}$), and sulfur dioxide (SO_2).

For developments involving new or expanded roadways, the pollutants of primary concern for project-level impacts are CO and PM_{10} (see Transportation Conformity rules under 40 CFR 91, Subpart A). These pollutant emissions are due to motor vehicle exhaust and fugitive dust resuspension by moving vehicles. While monitoring data for these pollutants are not available in Carver County, such data are being monitored in more densely populated and highly developed areas of Hennepin County, which is just northeast of Carver County. The Hennepin County CO and PM_{10} data available on the EPA's AIRS web site indicate that monitored concentrations are well below the limits established by NAAQS.

Project Impacts

The EPA and MPCA currently do not require PM_{10} analysis and dispersion modeling for roadway projects. However, such projects can sometimes require a CO hot-spot analysis under current rules. The Minnesota Department of Transportation (MnDOT) has developed a screening process to determine when potentially adverse CO impacts might occur, and which must then be analyzed using hot-spot analysis procedures. These procedures are based on the total average daily traffic (ADT) volumes for intersections affected by the project.

According to MPCA procedures, a subject project requires a CO hot-spot analysis if the project will: 1) affect traffic at one of three monitored (for CO) intersections, 2) affect traffic at one of seven MnDOT-listed intersections with high traffic levels, or 3) would have traffic levels in excess of a benchmark level of 77,200 vehicles per day.

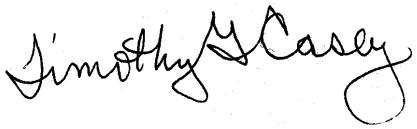
Based on year 2025 traffic forecasts for intersections in the project area, the highest total daily traffic volume for any intersection in the immediate project area will occur at Powers Road and Lyman Boulevard, with 29,227 vehicles per day. This is far below the MnDOT benchmark level to require modeling.

Regarding items 1 & 2 above, the nearest of the ten (10) specified intersections to the project area is the intersection of TH-7 and TH-101, located approximately 6 miles north-northeast of the project area. Based on the current and planned (by 2025) highway network for the area, the primary routes of access would be from the future Highway 212/312 routes, which will provide access to the project area from the greater metropolitan area. No project-related impact is expected on the TH-7/TH-101 intersection. Therefore, this development would not fall under MnDOT analysis guidelines, and is presumed to have minimal impact on air quality.

Finally, CO emissions from motor vehicles, as well as ambient CO concentration levels, are continuing to fall, as the nation's motor vehicle fleet is modernized with lower-emitting vehicles. Despite population growth in most metropolitan areas of the country, the reduction in per-vehicle CO emissions has more than offset the increased number of vehicles traveling the highways.

Thanks for the opportunity to provide HDR's environmental acoustics services. I can be reached at (763) 591-5450 if you have questions or comments about this analysis. We're an employee-owned company, thanks for choosing HDR.

Sincerely,
HDR Engineering, Inc.



Timothy G. Casey, QEP
Environmental Acoustics Program Manager

Attachments: Figures 1 through 2

65-dBA L10 Contour

60-dBA L50 Contour

Monitoring Location

1

2

3

NORTH-SOUTH ROADWAY 2

EAST WEST ROADWAY

NORTH-SOUTH ROADWAY 1

N

W E

S

700 0 700 1400 Feet

Chanhassen AUAR
Daytime Noise Contours

Figure 1

55-dBA L10 Contour

50-dBA L50 Contour

Monitoring Location

1

2

3

NORTH-SOUTH ROADWAY 2

EAST WEST ROADWAY

NORTH-SOUTH ROADWAY 1

N

W E

S

700 0 700 1400 Feet

Chanhassen AUAR
Nighttime Noise Contours

Figure 2