

ACOUSTICAL ANALYSIS REPORT

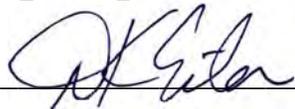
**Oakmont II Subdivision
San Diego County Tentative Map 5421**

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EXECUTIVE SUMMARY

The proposed project, Tentative Map (TM) 5421, consists of the subdivision of a 103-acre parcel into 20 lots for residential development. The project site is located at the intersection of Old Highway 80 and Flinn Springs Road, in the unincorporated community of Lakeside, County of San Diego, California. The project site is currently vacant.

The primary noise sources in the vicinity of the project site include automobile and truck traffic noise from Interstate 8 (I-8), Old Highway 80, and Flinn Springs Road. Oak Creek Road is a local road with no available traffic data and is considered to have an insignificant impact on the site. Shanteau Drive and Snow View Drive are residential streets with minimal traffic activity and no available traffic data, and are considered to have an insignificant impact on the project site. Aircraft overflight noise associated with Gillespie Field Airport has been evaluated and has an insignificant noise impact on the project site as the site is located well outside of the 60 Community Noise Equivalent Level (CNEL) contour. The current calculated on-site traffic noise level at the southwestern corner of the property is 72 CNEL. The future (year 2030) on-site traffic noise level is expected to reach 75 CNEL at the same location.

Without mitigation, future exterior noise levels at TM 5421 will range from 38 CNEL where shielded by topography to 73 CNEL at the southwestern most corner of the project site. Future noise contours show that Lots 2 through 11 are anticipated to be exposed to greater than 60 CNEL at ground level in the future noise environment. Lot 1 is anticipated to be exposed to less than 60 CNEL at ground level; however, is expected to be exposed to greater than 60 CNEL at second story receivers. For this reason, Lots 1 through 11 are all located within the 60 CNEL noise easement, meaning that, at the time of building permit application, a supplemental noise study will be required for each of these lots to ensure exterior and interior noise levels are in compliance with the noise regulations of the County of San Diego and the State of California. The suggested noise protection easement is shown in Figure 6. The pad location for Lot 12 and all of Lots 13 through 20 are located well outside of the 60 CNEL contour and are impacted by substantially lower traffic noise levels.

For lots with a net area between 4,000 square feet and 10 acres, the County of San Diego requires that at least 10% of the net lot area be protected from noise levels greater than 60 CNEL. Noise attenuation barriers have been modeled for Lots 2, 3, 4, 5, 6, 8, 10, and 11 to demonstrate that achieving 60 CNEL at 10% of the net lot area is feasible. At the time of building permit application, alternate mitigation measures may be proposed, including the use of architectural features (the residential structure) as mitigation or the combination of the residential structure and a free-standing sound wall, provided the lot can still provide the required noise-protected area.

A noise protection easement should be applied to the project in the location of the second story receiver 60 CNEL contour, shown in Figure 6. This easement would contain Lots 1 through 11, and signifies that, due to high noise levels at future building facades, an exterior-to-interior analysis should be performed for each of these lots at the time of building permit application. This analysis is required to demonstrate that interior noise levels will remain in compliance with County of San Diego and State of California noise regulations.

It is determined that typical construction activities will meet the County of San Diego temporary construction noise limit of 75 dBA at all adjacent property lines, given reasonable maintenance of equipment and conservative planning of simultaneous equipment operation. No mitigation is required for attenuating the brief construction noise impacts.

1.0 INTRODUCTION

This acoustical analysis report is submitted to satisfy the acoustical requirements of the County of San Diego for Tentative Map approval. Its purpose is to assess noise impacts from nearby roadway traffic and to identify project features or requirements necessary to achieve exterior noise levels of 60 CNEL or less at outdoor usable areas, in compliance with the County of San Diego noise regulations. Feasibility of interior noise mitigation will also be addressed.

All noise level or sound level values presented herein are expressed in terms of decibels, with A-weighting to approximate the hearing sensitivity of humans. Time-averaged noise levels are expressed by the symbol L_{EQ} , for a specified duration. The Community Noise Equivalent Level (CNEL) is a calculated 24-hour weighted average, where sound levels during evening hours of 7:00 p.m. to 10:00 p.m. have an added 5 dB weighting, and sound levels during nighttime hours of 10:00 p.m. to 7:00 a.m. have an added 10 dB weighting. This is similar to the Day-Night sound level, L_{DN} , which is a 24-hour average with an added 10 dB weighting on the same nighttime hours but no added weighting on the evening hours. Sound levels expressed in CNEL are always based on A-weighted decibels. These metrics are used to express noise levels for both measurement and municipal regulations, for land use guidelines, and for enforcement of noise ordinances. Further explanation can be provided upon request.

1.1 Project Description

The proposed project, Tentative Map 5421 consists of the limited improvement and division of one 102.97 acre parcel into a 20-lot minor residential subdivision. Vehicle access to the lots will be from new residential roadways accessed from Flinn Springs Road, Old Highway 80, and Oak Creek Road. New roadways will provide underlying joint utility trenches for utility access to adjoining lots, and water lines will be constructed. No mass grading will take place on site, with the intention of future residential development by individual lot owners. Please refer to project plans provided as Appendix A for more details.

1.2 Environmental Settings & Existing Conditions

1.2.1 Project Location

The project site is located at the intersection of Old Highway 80 and Flinn Springs Road in the unincorporated community of Lakeside, County of San Diego, California. The Assessor's Parcel Number (APN) for the property is 396-020-13-00. The property has an overall site area of approximately 103 acres. Currently, the project site is vacant.

The subject site is currently zoned for residential use. Neighboring land use is primarily residential as is future land use. The project location is shown on the Vicinity Map, Figure 1, following this report. An Assessor's Parcel Map, Satellite Aerial Photograph, and Topographic Map of this area are also provided as Figures 2 through 4.

1.2.2 Existing Traffic Volumes

The primary noise sources in the vicinity of the project site include automobile and truck traffic noise from I-8, Old Highway 80, and Flinn Springs Road. Oak Creek Road is a local road with no available traffic data, and is also considered to have an insignificant impact on the site. Shanteau

Drive and Snow View Drive are residential streets with minimal activity and no available traffic data, and are considered to have a negligible impact on the project site. Noise associated with aircraft overflight operations from Gillespie Field Airport is insignificant as the project site is located well outside of the 60 CNEL airport noise contours. No other noise source is considered significant.

I-8 is a four-lane, two-way major highway running east-west near the project site. The paved roadway width is approximately 155 feet, with a vegetated 75 foot center median. The posted speed limit is 65 mph. According to the SanDAG Series 12 Traffic Forecast Information Center (http://gis.sandag.org/tficsr12/tfic_2008.html), I-8, in the vicinity of the project site, currently carries a traffic volume of approximately 27,300 Average Daily Trips (ADT) for eastbound and 27,300 ADT for westbound traffic.

Old Highway 80 is a two-lane, two-way collector running southwest-northeast near the project site. The posted speed limit is 35 mph. The actual speed of vehicles traveling on Old Highway 80, in the vicinity of the project site, is estimated to be 35 mph. According to the SanDAG, Old Highway 80, in the vicinity of the project site, currently carries a traffic volume of approximately 4,000 ADT.

Flinn Springs Road is a two-lane, two-way rural collector running northwest-southeast near the project site. The posted speed limit is 25 mph. According to SanDAG, Flinn Springs Road currently carries approximately 2,300 ADT.

Current and future traffic volumes for the roadway sections near the project site are shown below in Table 1. For further roadway details and ADT traffic volumes, please refer to Appendix B: Traffic Noise Model (TNM) Data and Results.

Table 1. Overall Traffic Information				
Roadway Name	Speed Limit (mph)		Current ADT (2008)	Future ADT (2030)
	Current	Future		
I-8	65	65	54,600	101,000
Old Highway 80	35	35	4,000	11,000
Flinn Springs Road	25	25	2,300	3,100

Truck percentages for I-8 were taken directly from the 2011 Caltrans Truck Traffic on Freeways document, and were shown to be 3.6% medium trucks and 3.3% heavy trucks. Truck percentages for Old Highway 80 were obtained from the San Diego County Department of Public Works, Materials Division and were calculated as 8.58% medium trucks and 2.49% heavy trucks. No traffic mix information was available for Flinn Springs Road, but based on neighboring and surrounding land use, roadway classification, professional experience and on-site observations, a truck percentage mix of 1.0% medium and 0.5% heavy trucks was used.

1.2.3 Measured Noise Level

An on-site inspection and traffic noise measurement were made on the afternoon of Monday, June 13, 2005. The weather conditions were as follows: clear skies, low humidity, temperatures in the high 80's with winds from the south at 5-10 mph. A "one-hour" equivalent measurement was made near the project property line at Flinn Springs Road. The microphone position was approximately five feet above the existing project site grade and approximately 21 feet from the centerline of Flinn Springs Road. Traffic volumes were recorded for automobiles, medium-size trucks, and large

trucks during the measurement period. After a continuous 15-minute sound level measurement, there was no change in the L_{EQ} and results were then recorded. The measured noise level and related weather conditions are found below in Table 2. More information can be found in Appendix B: Traffic Noise Model (TNM) Data and Results.

Table 2. On-Site Noise Measurement Conditions and Results	
Date	Monday, June 13, 2005
Time	1:45 p.m. - 2:00 p.m.
Conditions	Clear Skies, Winds from the south @ 5-10 mph, Temperature high 80's, Low Humidity
Measured Noise Level	70.3 dBA L_{EQ}

1.3 Methodology and Equipment

1.3.1 Field Measurement

Typically, a "one-hour" equivalent sound level measurement (L_{EQ} , A-Weighted) is recorded for at least one noise-sensitive location on the site. During the on-site noise measurement, start and end times are recorded, vehicle counts are made for cars, medium trucks (double-tires/two axles), and heavy trucks (three or more axles) for the corresponding road segment(s). Supplemental sound measurements of one hour or less in duration are often made to further describe the noise environment of the site.

For measurements of less than one hour in duration, the measurement time is long enough for a representative traffic volume to occur and the noise level (L_{EQ}) to stabilize; 15 minutes is usually sufficient for this purpose. The vehicle counts are then converted to one-hour equivalent volumes by using the appropriate multiplier.

Other field data gathered includes measuring or estimating distances, angles-of-view, slopes, elevations, roadway grades, and vehicle speeds. This data was checked against the available maps and records.

1.3.2 Roadway Noise Calculation

The Traffic Noise Model, Version 2.5 program released by the U.S. Department of Transportation was used to calculate the future daytime average hourly noise level (HNL) at various locations at the project site. The daytime average hourly traffic volume is calculated as 0.058 times the ADT, based on the studies made by Wyle Laboratories (see reference). The HNL is equivalent to the L_{EQ} , and both are converted to the CNEL by adding 2.0 decibels, as shown in the Wyle Study. Future CNEL is calculated for desired receptor locations using future road alignment, elevations, lane configurations, projected traffic volumes, estimated truck mixes, and vehicle speeds. Noise attenuation methods may be analyzed, tested, and planned with TNM, as required. Further explanation can be supplied on request.

1.3.3 Construction Noise Modeling

The equipment noise data and distance from the equipment to the receiver are used to calculate the sound pressure level due to divergence of sound waves in a free field. The noise attenuation, or insertion loss, achieved by a barrier is calculated as a single diffraction, by a thin barrier. This insertion loss is subtracted from the aforementioned sound pressure level to determine the sound pressure level with the barrier in place. Specific local atmospheric and environmental effects are not considered in these calculations. Noise receiver elevations were modeled at 5 feet above ground level elevation.

1.3.4 Measurement Equipment

Some or all of the following equipment was used at the site to measure existing noise levels:

- Larson Davis Model 820 Integrating Sound Level Meter, Type 1, Serial # 0316
- Larson Davis Model CA200 Calibrator, Serial # 0292
- Hand-bearing magnetic compass, microphone with windscreen, tripods
- Distance measurement wheel, digital camera

The sound level meter was field-calibrated immediately prior to the noise measurement and checked afterward, to ensure accuracy. All sound level measurements conducted and presented in this report, in accordance with the regulations, were made with a sound level meter that conforms to the American National Standards Institute specifications for sound level meters ANSI S1.4-1983 (R2001). All instruments are maintained with National Bureau of Standards traceable calibration, per the manufacturers' standards.

2.0 NOISE SENSITIVE LAND USES AFFECTED BY AIRBORNE NOISE

2.1 Guidelines for the Determination of Significance

The County of San Diego Noise Element to the General Plan states that exterior noise levels at outdoor use areas of residential property should not exceed 60 CNEL. In the event that noise levels exceed 60 CNEL, mitigation must be proposed to bring noise levels into compliance. For lots with net areas ranging from 4,000 square feet to 10 acres, as is the case for most lots on this project site, at least 10% of the net lot area must be noise-protected. In addition, the interior noise levels of the on-site residences must not exceed 45 CNEL, as per the County of San Diego Noise Element as well as the State of California Building Code. Pertinent sections of the County of San Diego Noise Element are provided as Appendix C.

2.2 Potential Noise Impacts

2.2.1 Potential Build-out Noise Conditions & Impacts

The future traffic volume was determined using the San Diego County General Plan Update 2030 Planning Commission Recommended LOS and Volume Plot for the Lakeside area, provided by County Noise Specialist Emmet Aquino. According to Mr. Aquino, the adjusted forecasted volume should be used in analysis. According to the map, the adjusted traffic volume for the year 2030 is expected to be 101,000 ADT for this stretch of I-8, 11,000 ADT for this stretch of Old Highway 80, and 3,100 ADT for Flinn Springs Road.

2.2.1.1 Exterior

The exterior noise impacts at the project site are primarily the result of automobile and truck traffic traveling on I-8, Olde Highway 80, and Flinn Springs Road. Without mitigation or proposed project structures, the future ground level 60 CNEL contour will be located approximately 950 feet north of the I-8 centerline, extending from east to west. The future 65 CNEL contour will be located approximately 830 feet north of the I-8 centerline, extending from east to west. The future 70 CNEL contour will be located approximately 400 feet north of the I-8 centerline, extending from east to west. For a graphical representation of these contours, please refer to Figure 5: Site Plan Showing Future Traffic CNEL Contours and Noise Measurement Location. As shown on this graphic, a portion of Lots 1, 8, 9, and 12 and all of Lots 2, 3, 4, 5, 6, 7, 10, and 11 will be contained within the 60 CNEL contour. The proposed pad locations for Lots 1 and 12 are shown to be protected from ground level noise exceeding 60 CNEL, and therefore, no additional analysis is required for ground level exterior noise levels at these locations.

Due to the topography of the site, second story receiver contours have also been generated to ensure that any lots with two-story residences will be adequately protected from interior noise levels exceeding 45 CNEL. These contours are a similar shape; however, the pad location for Lot 1 is shown to be exposed to greater than 60 CNEL at the second story. For this reason, this 60 CNEL contour should be considered the boundary of the noise protection easement for the site. The noise protection easement signifies that, at the time of building permit application, a supplemental noise study will be required for each of these lots (1 through 11) to ensure exterior and interior noise levels are in compliance with the noise regulations of the County of San Diego and the State of California. For a graphical representation of these contours and the suggested location of the noise protection easement, please refer to Figure 6: Future Traffic CNEL Contours at Second Story Receivers.

Noise levels have been evaluated in more depth at Lots 2 through 11, as these lots were shown to be located within the 60 CNEL contour at ground level. For each lot, four to five receivers have been placed that encompass at least 10% of the net lot area that must be noise-protected, per County Requirements. Noise levels have not been calculated at Lot 1 as contour calculations demonstrate that the pad location is not expected to be exposed to noise levels exceeding 60 CNEL at ground level, although second story receivers show that this lot must still be incorporated into the noise easement. Additionally, the pad location for Lot 12 and all of Lots 13 through 20 are located well outside of the 60 CNEL contour and are impacted by substantially lower traffic noise levels. For this reason, these lots have not been evaluated.

Please refer to Table 3 for calculated unmitigated traffic noise levels at outdoor use areas of Lots 2 through 11. For a graphical representation of receiver locations, please refer to Figures 7 through 16 for Lots 2 through 11, respectively.

Table 3. Future Traffic CNEL at Proposed Outdoor Use Areas – Unmitigated					
Parcel	Net Area (sf)	Minimum Required Noise-Protected Area (sf)	Receiver #	Future Exterior Traffic CNEL	Total Area Calculated (sf)
Lot 2	91,040	9,104	2-1	71	9,104 (10%)
			2-2	66	
			2-3	66	
			2-4	68	
			2-5	68	

Table 3. Future Traffic CNEL at Proposed Outdoor Use Areas – Unmitigated					
Parcel	Net Area (sf)	Minimum Required Noise-Protected Area (sf)	Receiver #	Future Exterior Traffic CNEL	Total Area Calculated (sf)
Lot 3	60,548	6,055	3-1	67	6,185 (10%)
			3-2	67	
			3-3	71	
			3-4	71	
Lot 4	49,223	4,922	4-1	66	6,369 (13%)
			4-2	66	
			4-3	66	
			4-4	64	
Lot 5	43,560	4,356	5-1	65	4,504 (10%)
			5-2	64	
			5-3	61	
			5-4	61	
Lot 6	110,642	11,064	6-1	65	13,374 (12%)
			6-2	65	
			6-3	67	
			6-4	67	
			6-5	59	
Lot 7	72,745	7,275	7-1	59	7,399 (10%)
			7-2	60	
			7-3	57	
			7-4	57	
Lot 8	65,775	6,578	8-1	62	7,474 (11%)
			8-2	55	
			8-3	58	
			8-4	55	
Lot 9	45,738	4,574	9-1	60	4,632 (10%)
			9-2	60	
			9-3	57	
			9-4	57	
Lot 10	43,560	4,356	10-1	59	4,867 (11%)
			10-2	61	
			10-3	62	
			10-4	63	
			10-5	63	
Lot 11	43,560	4,356	11-1	64	5,646 (13%)
			11-2	62	
			11-3	61	
			11-4	60	

Noise levels are shown to exceed 60 CNEL at many of the calculated receiver locations. Mitigation will be required for all lots shown above with the exception of Lots 7 and 9, which are anticipated to receive sufficient noise attenuation due to the topography and current configuration of the lot. These lots will still be subject to additional evaluation at the time of building permit application to confirm that the required noise-protected area will be provided. Please refer to Section 2.2.2.1 for mitigation details.

2.2.1.2 Interior

The State of California and the County of San Diego require buildings to be designed in order to attenuate, control, and maintain interior noise levels to below 45 CNEL in habitable residential space. Current exterior building construction is generally expected to achieve at least 15 decibels of exterior-to-interior noise attenuation, with windows opened. Therefore, proposed project building structures exposed to exterior noise levels greater than 60 CNEL could be subject to interior noise levels exceeding the 45 CNEL noise limit for residential habitable space.

Calculations show that future ground level noise exceeds 60 CNEL on Lots 2 through 11, and that second story noise levels exceed 60 CNEL at the pad location for Lot 1. All of these lots are contained within the suggested site noise protection easement shown on Figure 6. Due to high noise levels at future building facades, an exterior-to-interior analysis should be performed for each of these lots at the time of building permit application. As the pad location for Lot 12 and all of Lots 13 through 20 are located well outside of the 60 CNEL contour, interior noise analyses will not be required for these lots.

2.2.2 Design Considerations & Mitigation Measures

2.2.2.1 Exterior

As Lots 2, 3, 4, 5, 6, 8, 10, and 11 are shown to be exposed to greater than 60 CNEL at 10% of their net lot areas, mitigation has been proposed that is expected to bring noise levels into compliance. Noise attenuation barriers have been modeled to demonstrate that achieving 60 CNEL at 10% of the net lot area is feasible. Due to the configuration of Lot 2 and the high noise levels in this location, the currently proposed residence has also been modeled as a 15-foot high barrier in calculations. At the time of building permit application, alternate mitigation measures may be proposed for any lot, including the use of architectural features (the residential structure) as mitigation or the combination of the residential structure and a free-standing sound wall, provided the lot can still provide the required noise-protected area. Approximate sound barrier locations are shown in Figures 7, 8, 9, 10, 11, 13, 15, and 16, for Lots 2, 3, 4, 5, 6, 8, 10, and 11, respectively. Mitigated noise levels are shown in Table 4.

Table 4. Future Traffic CNEL at Proposed Outdoor Use Areas – Mitigated					
Parcel	Total Area Calculated (sf)	Sound Barrier Height (ft)	Receiver #	Future Exterior Traffic CNEL	In Compliance?
Lot 2	9,104 (10%)	8 / 10*	2-1	56	Yes
			2-2	56	
			2-3	51	
			2-4	60	
			2-5	60	
Lot 3	6,185 (10%)	9	3-1	60	Yes
			3-2	59	
			3-3	58	
			3-4	59	
Lot 4	6,369 (13%)	6	4-1	60	Yes
			4-2	59	
			4-3	59	
			4-4	58	

Table 4. Future Traffic CNEL at Proposed Outdoor Use Areas – Mitigated

Parcel	Total Area Calculated (sf)	Sound Barrier Height (ft)	Receiver #	Future Exterior Traffic CNEL	In Compliance?
Lot 5	4,504 (10%)	6	5-1	58	Yes
			5-2	57	
			5-3	56	
			5-4	58	
Lot 6	13,374 (12%)	6	6-1	56	Yes
			6-2	57	
			6-3	58	
			6-4	57	
			6-5	55	
Lot 8	7,474 (11%)	6	8-1	54	Yes
			8-2	55	
			8-3	53	
			8-4	52	
Lot 10	4,867 (11%)	6	10-1	59	Yes
			10-2	59	
			10-3	57	
			10-4	56	
			10-5	60	
Lot 11	5,646 (13%)	6	11-1	59	Yes
			11-2	56	
			11-3	58	
			11-4	57	

*Mitigation for this lot also includes the proposed residence, modeled as 15 feet high. Please refer to Figure 7 for sound barrier configuration showing different heights.

With the modeled sound attenuation barriers and the residence as currently designed for Lot 2, noise levels are anticipated to comply with the County of San Diego requirement for 10% of the net lot area to be noise-protected. The sound attenuation barriers may be a single sound wall in design or a combination of a sound wall atop an earthen berm. For the purpose of this analysis, all proposed sound attenuation barrier heights shall be based on the finished proposed pad grade elevation of each lot, with the exception of Lot 2, which shows that the barrier must be placed partially on a sloped area (see Figure 7 for more details). A sound wall should be solid and constructed of masonry, wood, plastic, fiberglass, steel, or a combination of those materials, with no cracks or gaps, through or below the wall. Any seams or cracks must be filled or caulked. If wood is used, it can be tongue and groove and must be at least f-inch thick or have a surface density of at least 3½ pounds per square foot. Where architectural or aesthetic factors allow, glass or clear plastic may be used on the upper portion, if it is desirable to preserve a view. Sheet metal of 18-gauge (minimum) may be used, if it meets the other criteria and is properly supported and stiffened so that it does not rattle or create noise itself from vibration or wind. Any gate(s) proposed to be constructed in a sound wall must be designed with overlapping closures. The gate(s) may be of ¾-inch or better wood, solid-sheet metal of at least 18-gauge metal, or an exterior-grade solid-core steel door with prefabricated door jambs.

It should be noted that the barrier walls shown in the attached figures have been modeled to show the feasibility of achieving compliance with County noise regulations. At the time of building permit application, alternate mitigation measures may be proposed, including the use of architectural

features (the residential structure) as mitigation or the combination of the residential structure and a free-standing sound wall, provided the lot can still provide the required noise-protected area.

2.2.2.2 Interior

As detailed above, Lots 1 through 11 will require interior noise analyses to determine mitigation measures necessary to achieve interior noise levels of 45 CNEL. An analysis can be prepared for each lot at the time of building permit application.

3.0 PROJECT-GENERATED AIRBORNE NOISE

3.1 Guidelines for Determination of Significance

The County of San Diego Municipal Code states that noise levels from stationary sources shall not exceed 55 dBA between the hours of 7 a.m. and 10 p.m. and 45 dBA between the hours of 10 p.m. and 7 a.m. at residential properties.

Temporary construction noise limits for noise sensitive receivers are designated within the County of San Diego Municipal Code and state that noise from temporary construction activity should not exceed an average sound level of 75 dBA for an 8-hour period between 7 a.m. to 7 p.m. at the property lines of noise sensitive receivers. Noise sensitive receivers are defined as “any property which is developed and used either in part or in whole for residential purposes.” Pertinent sections of the County of San Diego Noise Ordinance are provided in Appendix C.

3.2 Potential Operational Noise Impacts

The only anticipated operational noise impact from the proposed project would be residential HVAC units. The units are anticipated to be small capacity, and are not expected to have a significant noise impact on any surrounding property. If needed, these noise sources can be evaluated at the time of building permit application.

3.3 Potential General Construction Noise Impacts

Typical construction equipment anticipated to be used on site is shown in Table 5.

Table 5. Typical Construction Equipment Noise Levels*			
Receiver	Range of Noise Level at 50 feet	Nominal Noise Level L_{eq} , at 50 feet	Height of Noise Source
Grader	73 to 95 dBA	85 dBA	8 feet
Paver	80 to 92 dBA	89 dBA	-
Roller, 180 HP	78 to 84 dBA	79 dBA	-
Trencher, 80 HP	76 to 86 dBA	82 dBA	-
Truck, 125 HP	76 to 85 dBA	80 dBA	-
Water Truck, 500 HP	79 to 88 dBA	84 dBA	3 feet

*Source: Wieland Associates, 1999

Construction activities should be limited to the following hours: 7 a.m. to 7 p.m., Monday through Friday (except legal holidays), and 7 a.m. to 6 p.m. on Saturday. There will be no construction activity on Sunday. Fences and gates will be installed as a control feature to limit after hours access to the construction site.

Temporary construction noise generated from the expected proposed construction on the project site, due solely to private roadway grading and the installation of a water supply line system, has been evaluated, and is considered to be controllable by standard construction noise management methods. The limited nature of the overall site improvement, namely the disturbance of approximately 1% of the 103 acre parcel over the course of approximately one week, with no planned mass grading, represents a manageable noise impact to surrounding residences without noise impact mitigation. The location of Flinn Springs Road and Oak Creek Road, providing distance between the project site and adjacent properties, as well as site-specific topographical features, result in increased noise attenuation.

It is determined that construction improvement activities will meet the San Diego temporary construction noise limit of 75 dBA at all adjacent property lines, given reasonable maintenance of equipment and conservative planning of simultaneous equipment operation. Given the construction noise limits at the relative property lines and beyond to the nearest residential structures, no mitigation is required for attenuating the brief construction noise impacts.

Furthermore, equipment used in construction shall be maintained in proper operating condition, and engines shall be equipped with appropriate mufflers. With these recommendations, and controlled access to the site, it is expected that construction equipment noise levels will be at or below an average eight-hour equivalent noise level of 75 dBA, in compliance with County of San Diego regulations.

4.0 CONCLUSION

For these lot sizes, the County of San Diego requires that at least 10% of the net lot area be protected from noise levels greater than 60 CNEL. Calculations have been performed to demonstrate that meeting this requirement is feasible for all lots. At the time of building permit application, alternate mitigation measures may be proposed, including the use of architectural features (the residential structure) as mitigation or the combination of the residential structure and a free-standing sound wall, provided the lot can still provide the required noise-protected area.

A noise protection easement should be applied to the project in the location of the second story receiver 60 CNEL contour, shown in Figure 6. This easement would contain Lots 1 through 11, and signifies that, due to high noise levels at future building facades, an exterior-to-interior analysis should be performed for each of these lots at the time of building permit application. This analysis is required to demonstrate that interior noise levels will remain in compliance with County of San Diego and State of California noise regulations.

It is determined that typical construction activities will meet the County of San Diego temporary construction noise limit of 75 dBA at all adjacent property lines, given reasonable maintenance of equipment and conservative planning of simultaneous equipment operation. No mitigation is required for attenuating the brief construction noise impacts.

5.0 CERTIFICATION

The findings and recommendations of this acoustical analysis report are based on the information available and are a true and factual analysis of the potential acoustical issues associated with the proposed Oakmont II Subdivision, TM 5421, located within the County of San Diego, California. This report was prepared by Amy Hool and Douglas K. Eilar.



Douglas K. Eilar
Principal/Senior Acoustical Consultant

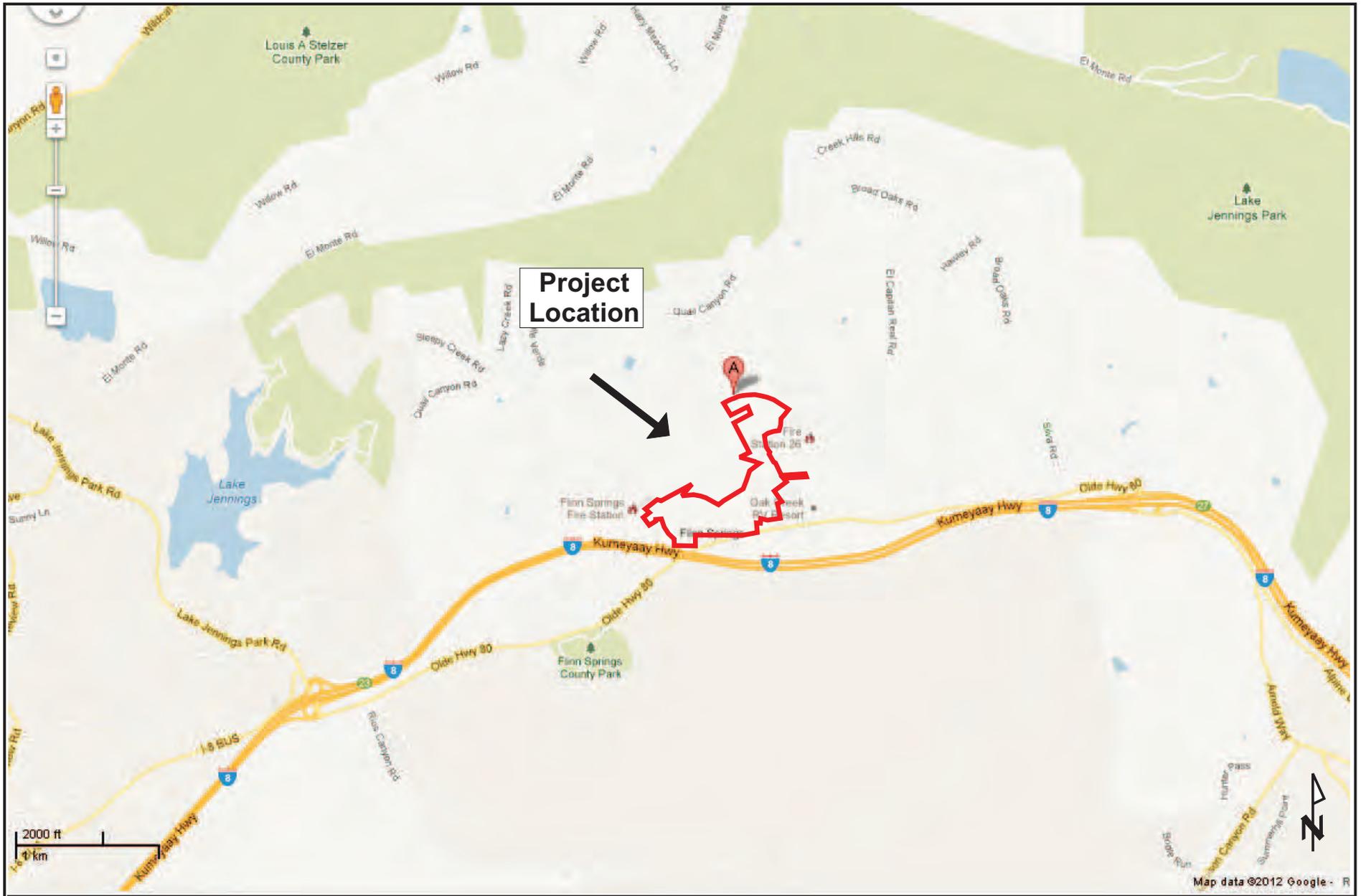


Amy Hool, Acoustical Consultant

6.0 REFERENCES

1. 2007 California Building Code, Based on the 2006 International Building Code, Chapter 12, Section 1207 - *Sound Transmission Control*.
2. Federal Highway Administration, Traffic Noise Model Version 2.5.
3. County of San Diego Noise Element to the General Plan.
4. County of San Diego Noise Ordinance.
5. Harris, Cyril M., Handbook of Acoustical Measurements and Noise Control, 3rd Edition, Acoustical Society of America, 1998.
6. Heeden, Robert A., Compendium of Materials for Noise Control, U.S. Department of Health, Education and Welfare, National Institute for Occupational Safety and Health, November 1978.
7. Irvine, Leland K., Richards, Roy L., Acoustics and Noise Control Handbook for Architects and Builders, Kreiger Publishing Company, 1998.
8. NBS Building Sciences Series 77, Acoustical and Thermal Performance on Exterior Residential Walls, U.S. Department of Commerce/National Bureau of Standards, November 1976.
9. Western Electro-Acoustic Laboratory, Inc., 1711 Sixteenth Street, Santa Monica, California 90404, 213-80-9268, Sound Transmission Loss Vs. Glazing Type, Window Size and Air Filtration, January 1985. The research described in this report was prepared for the California Association of Window Manufacturers, 823 North Harbor Boulevard, Suite E, Fullerton, California 92632, 714-525-7088.
10. United States Department of Transportation Federal Highway Administration, Highway Construction Noise Handbook, Section 9.0 "Construction Equipment Noise Levels and Ranges," August 2006.
11. Wyle Laboratories, Development of Ground Transportation Systems Noise Contours for the San Diego Region, December, 1973

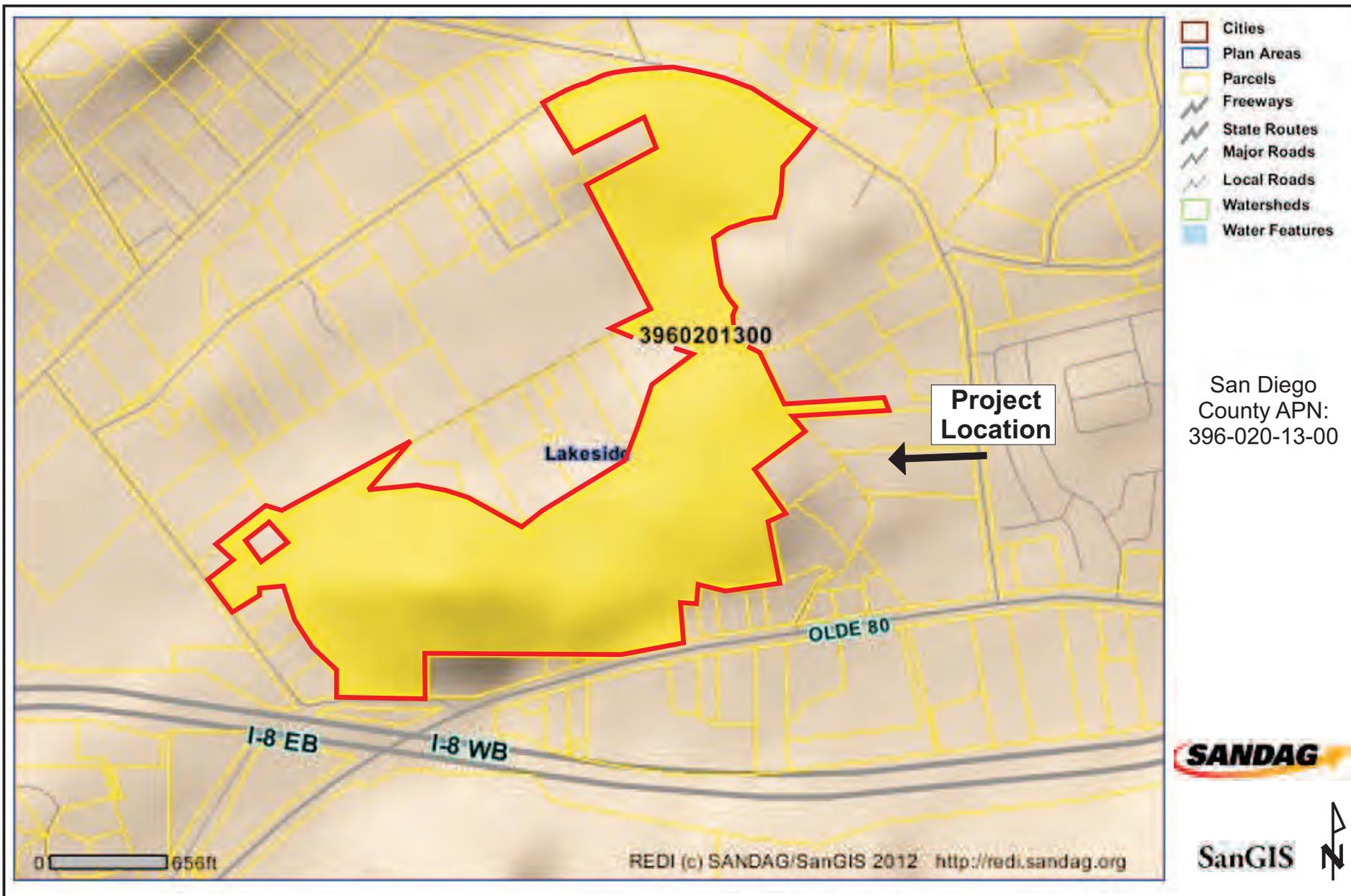
FIGURES



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Vicinity Map
Job #B21102N1

Figure 1



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Assessor's Parcel Map
 Job # B21102N1

Figure 2

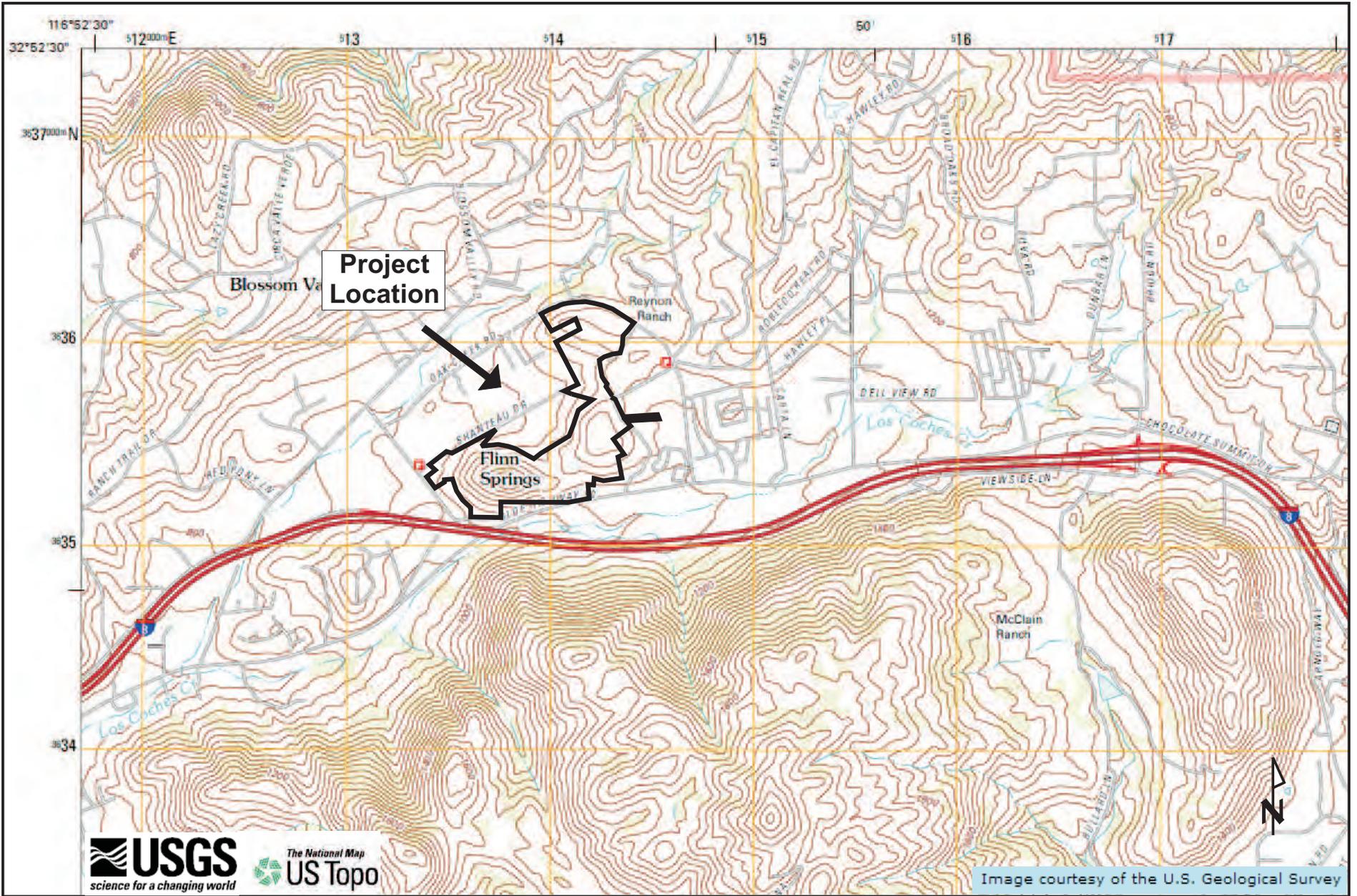


Project Location

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Satellite Aerial Photograph
Job # B211002N1

Figure 3



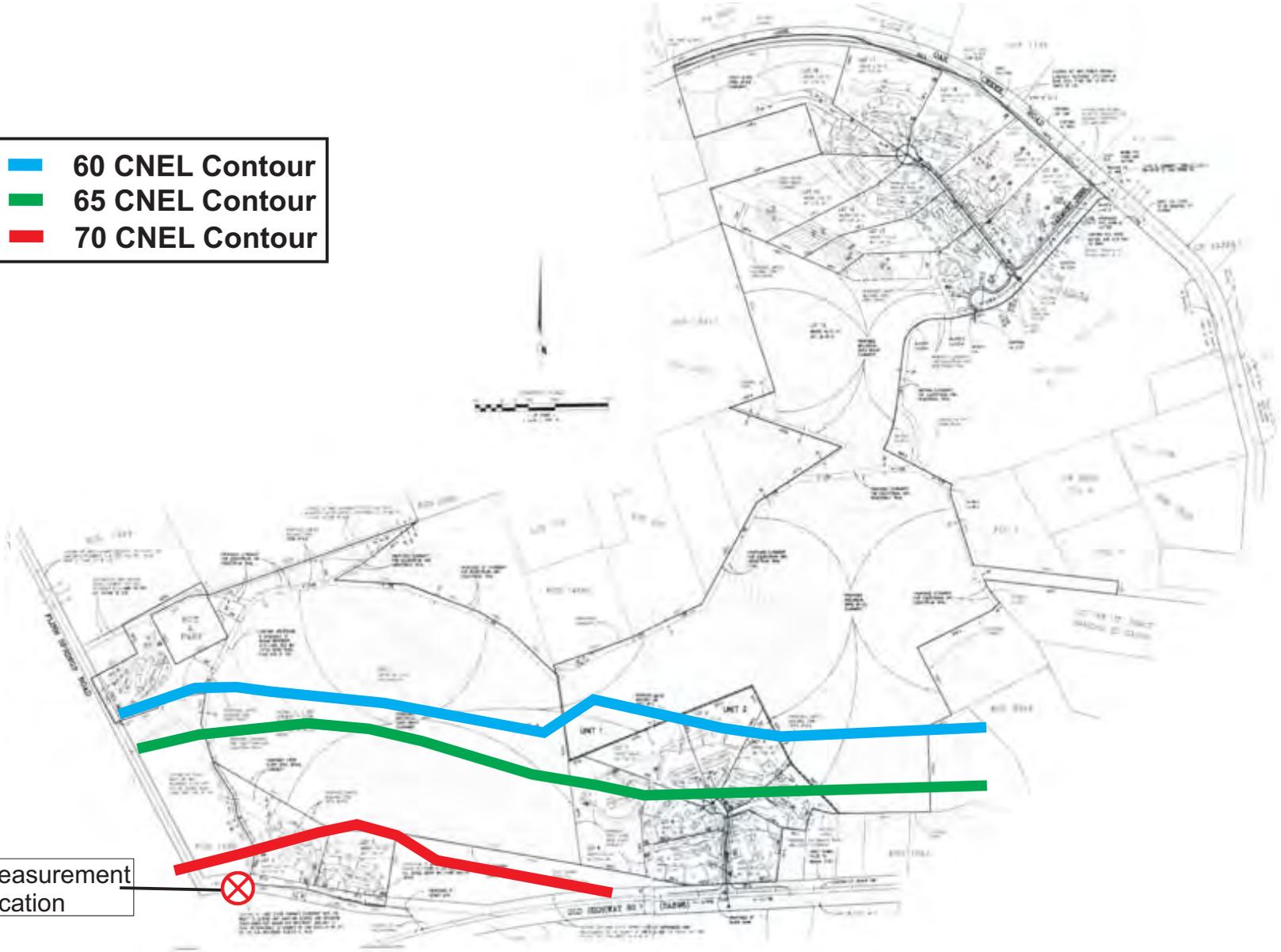
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Topographic Map
 Job # B21102N1

Figure 4

- 60 CNEL Contour
- 65 CNEL Contour
- 70 CNEL Contour

Noise Measurement Location

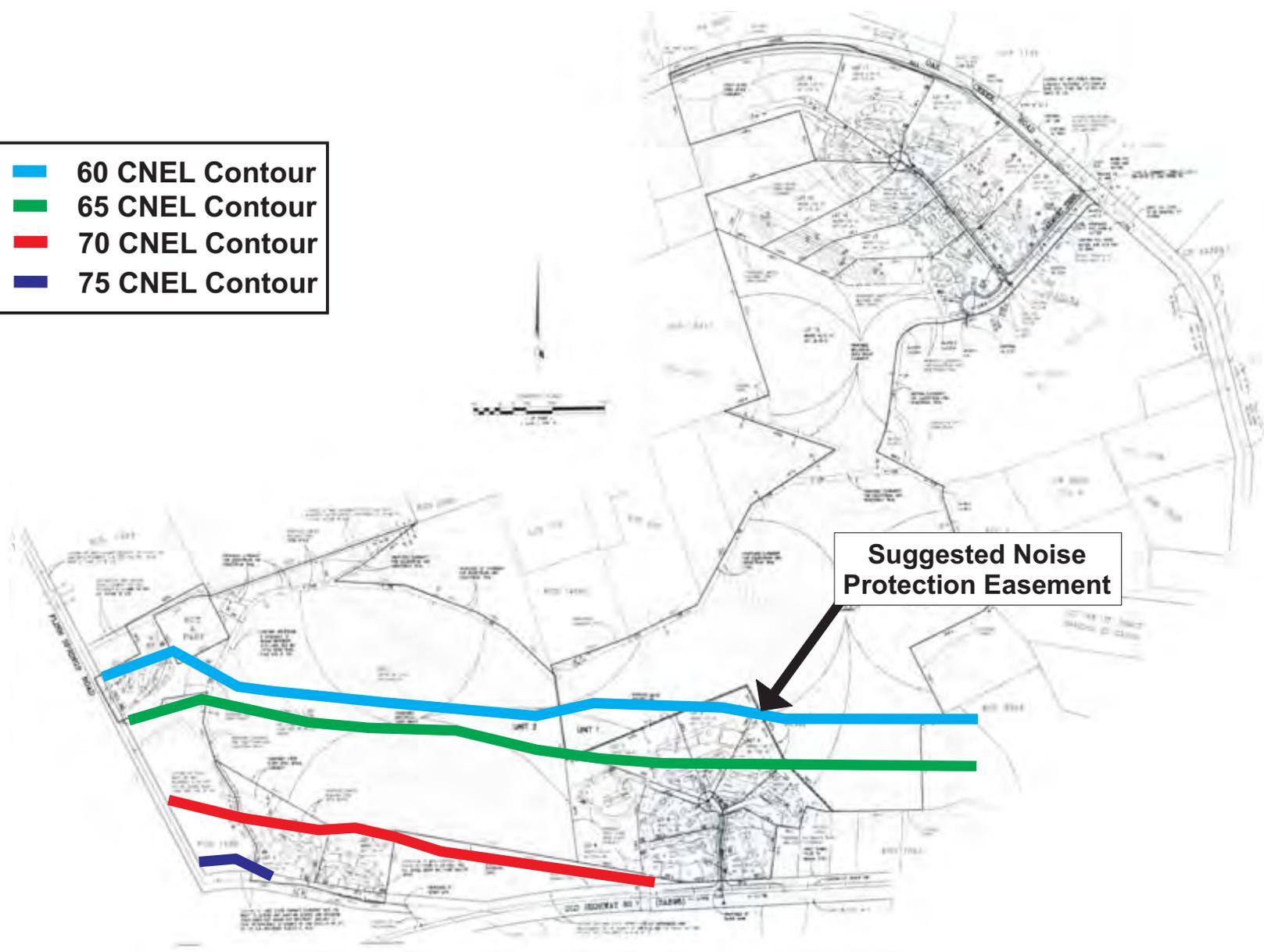


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Site Plan Showing Future Traffic CNEL
Contours and Noise Measurement Location
Job # B21102N1

Figure 5

- 60 CNEL Contour
- 65 CNEL Contour
- 70 CNEL Contour
- 75 CNEL Contour



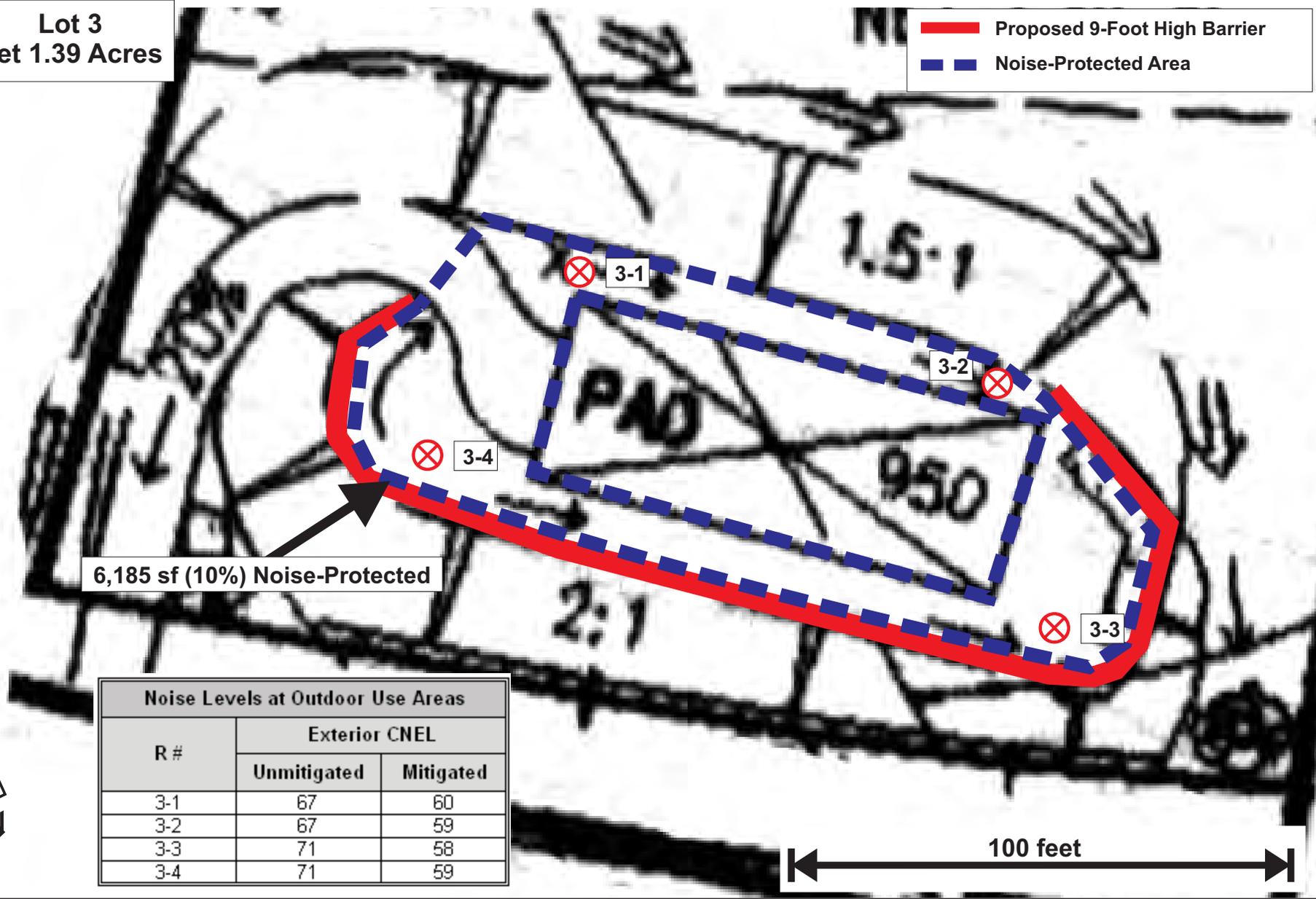
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Site Plan Showing Future Traffic CNEL
Contours at Second Story Receivers
Job # B21102N1

Figure 6

Lot 3
Net 1.39 Acres

Proposed 9-Foot High Barrier
Noise-Protected Area



6,185 sf (10%) Noise-Protected

Noise Levels at Outdoor Use Areas		
R #	Exterior CNEL	
	Unmitigated	Mitigated
3-1	67	60
3-2	67	59
3-3	71	58
3-4	71	59



100 feet

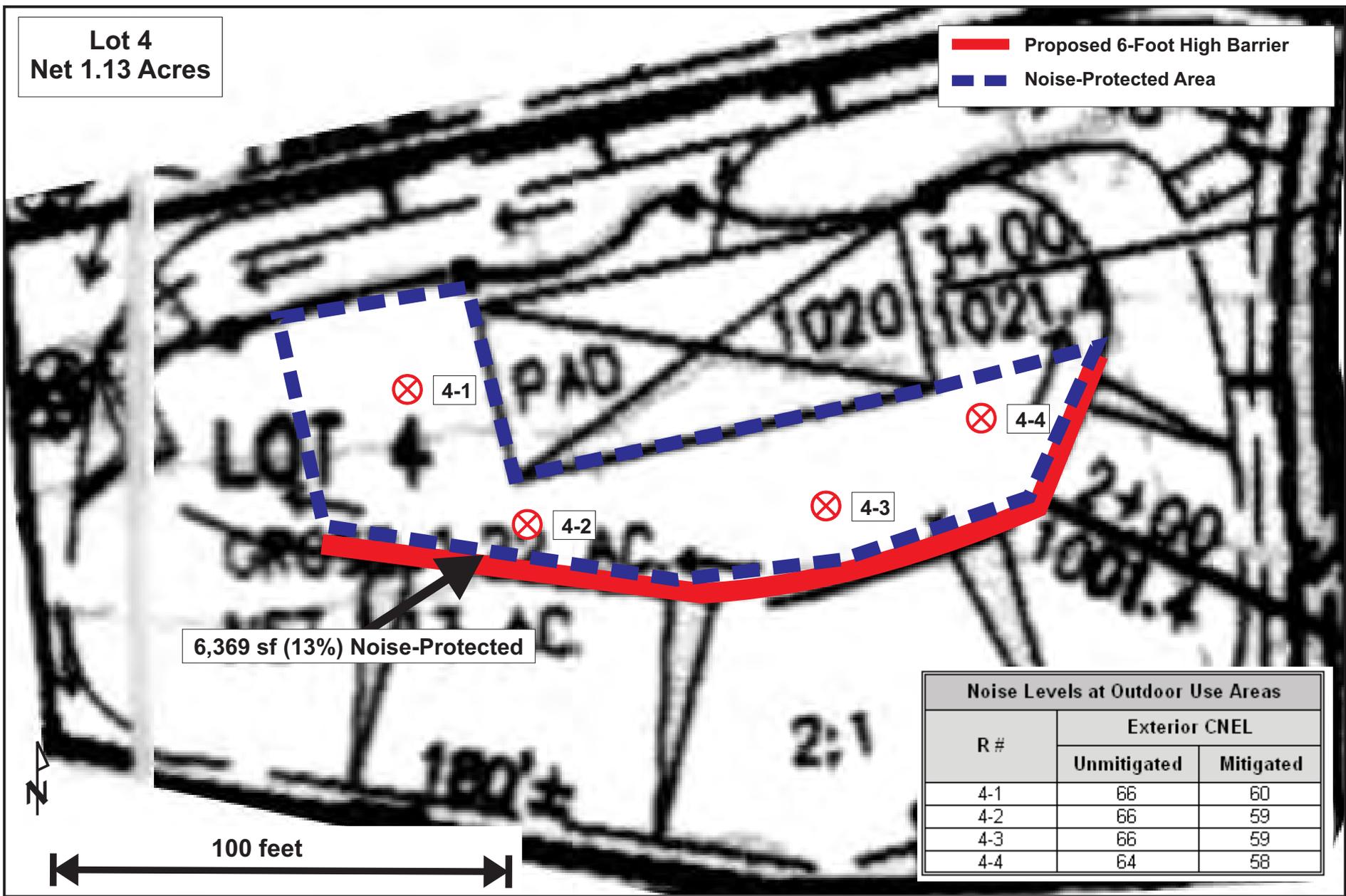
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**Site Plan Showing Future CNEL and Sound
 Attenuation Barrier Location - Lot 3**
 Job # B21102N1

Figure 8

Lot 4
Net 1.13 Acres

Proposed 6-Foot High Barrier
Noise-Protected Area



6,369 sf (13%) Noise-Protected

Noise Levels at Outdoor Use Areas		
R #	Exterior CNEL	
	Unmitigated	Mitigated
4-1	66	60
4-2	66	59
4-3	66	59
4-4	64	58

100 feet

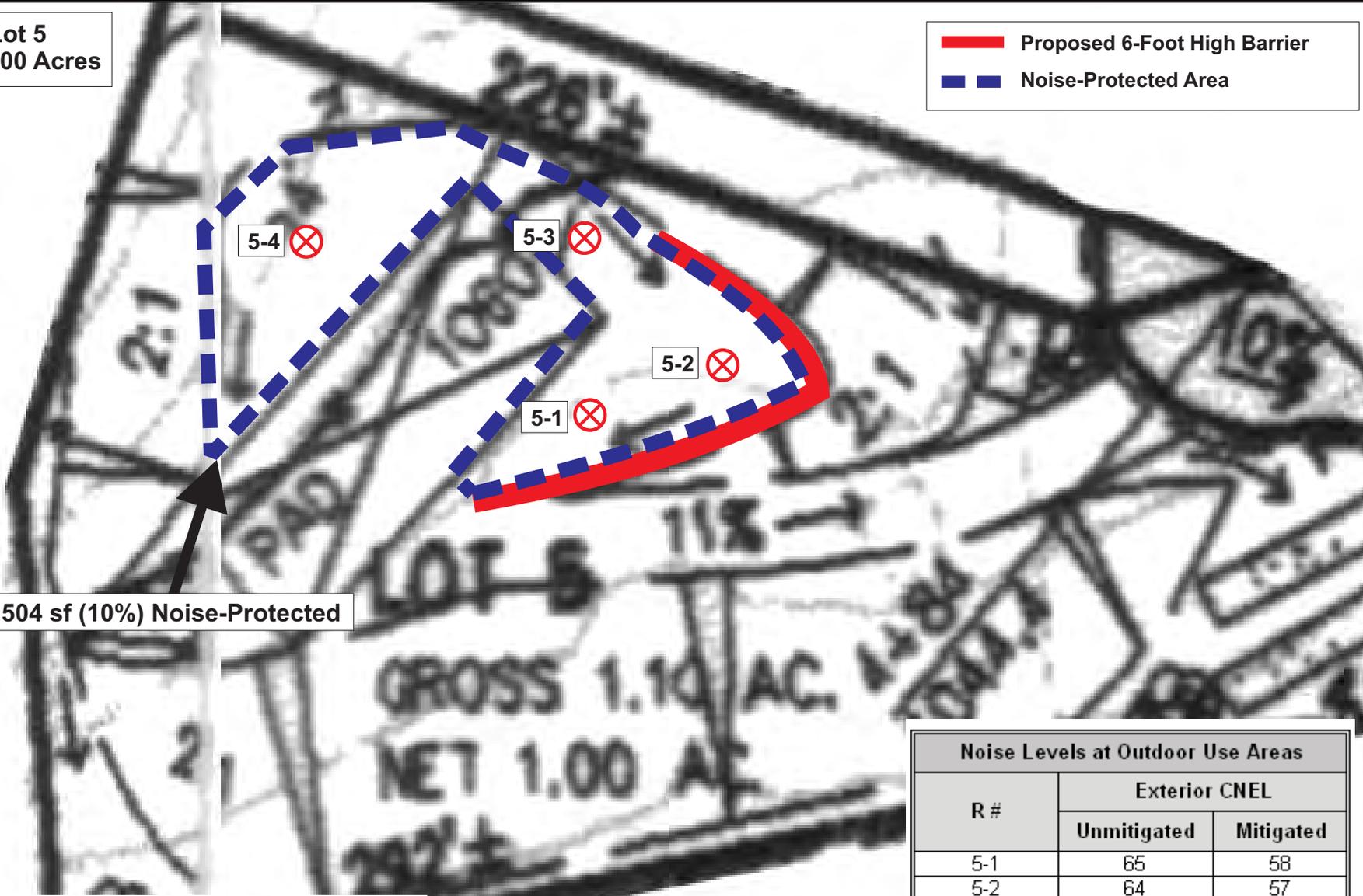
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Site Plan Showing Future CNEL and Sound
 Attenuation Barrier Location - Lot 4
 Job # B21102N1

Figure 9

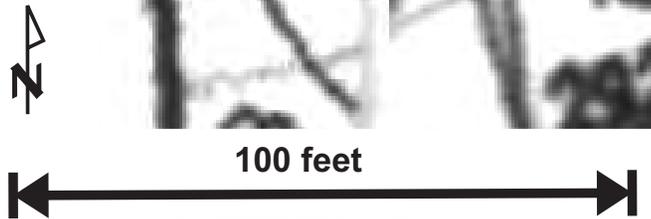
Lot 5
Net 1.00 Acres

▬ Proposed 6-Foot High Barrier
▬ Noise-Protected Area



4,504 sf (10%) Noise-Protected

Noise Levels at Outdoor Use Areas		
R #	Exterior CNEL	
	Unmitigated	Mitigated
5-1	65	58
5-2	64	57
5-3	61	56
5-4	61	58



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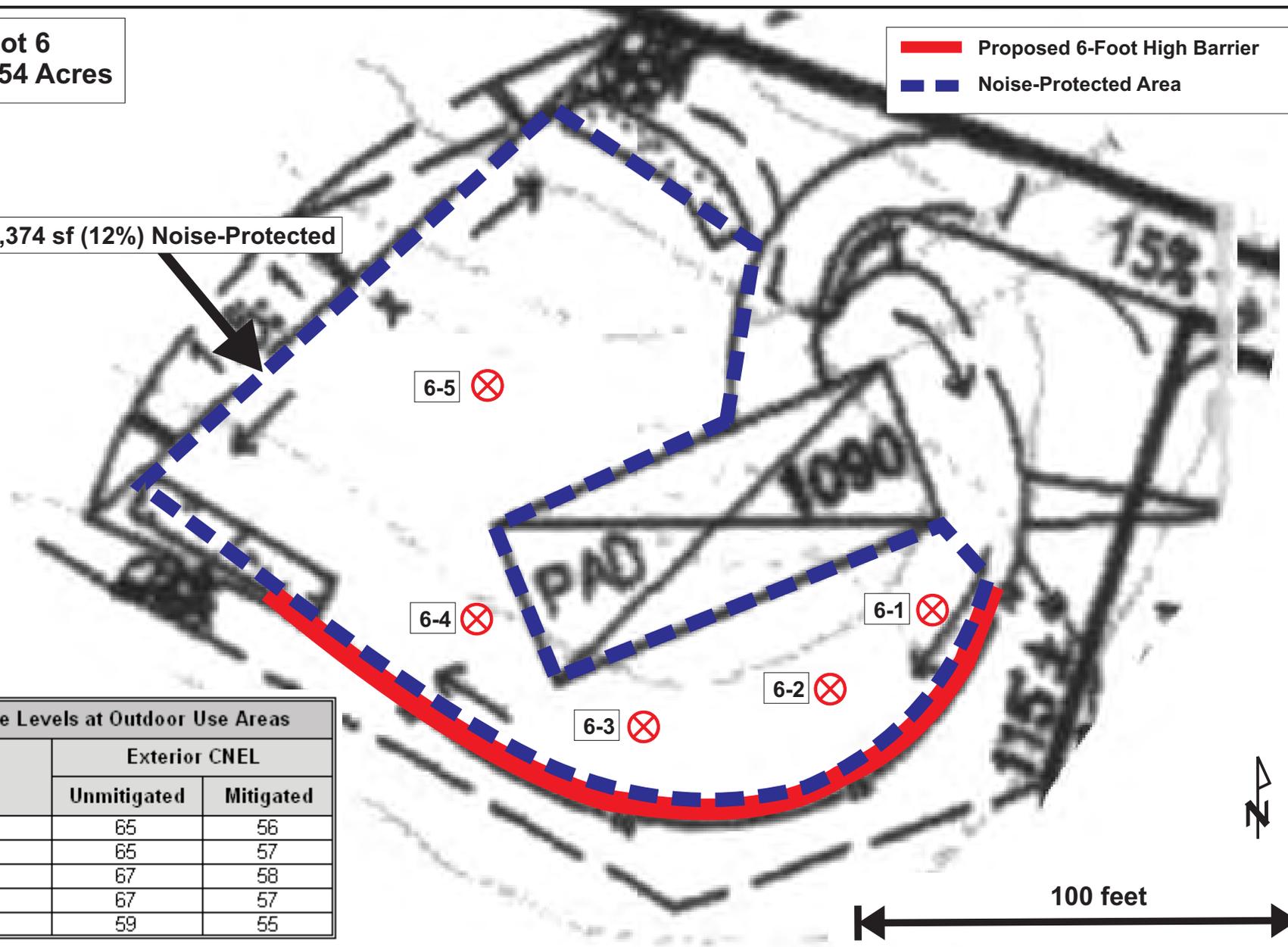
Site Plan Showing Future CNEL and Sound
Attenuation Barrier Location - Lot 5
Job # B21102N1

Figure 10

Lot 6
Net 2.54 Acres

 **Proposed 6-Foot High Barrier**
 **Noise-Protected Area**

13,374 sf (12%) Noise-Protected



Noise Levels at Outdoor Use Areas		
R #	Exterior CNEL	
	Unmitigated	Mitigated
6-1	65	56
6-2	65	57
6-3	67	58
6-4	67	57
6-5	59	55

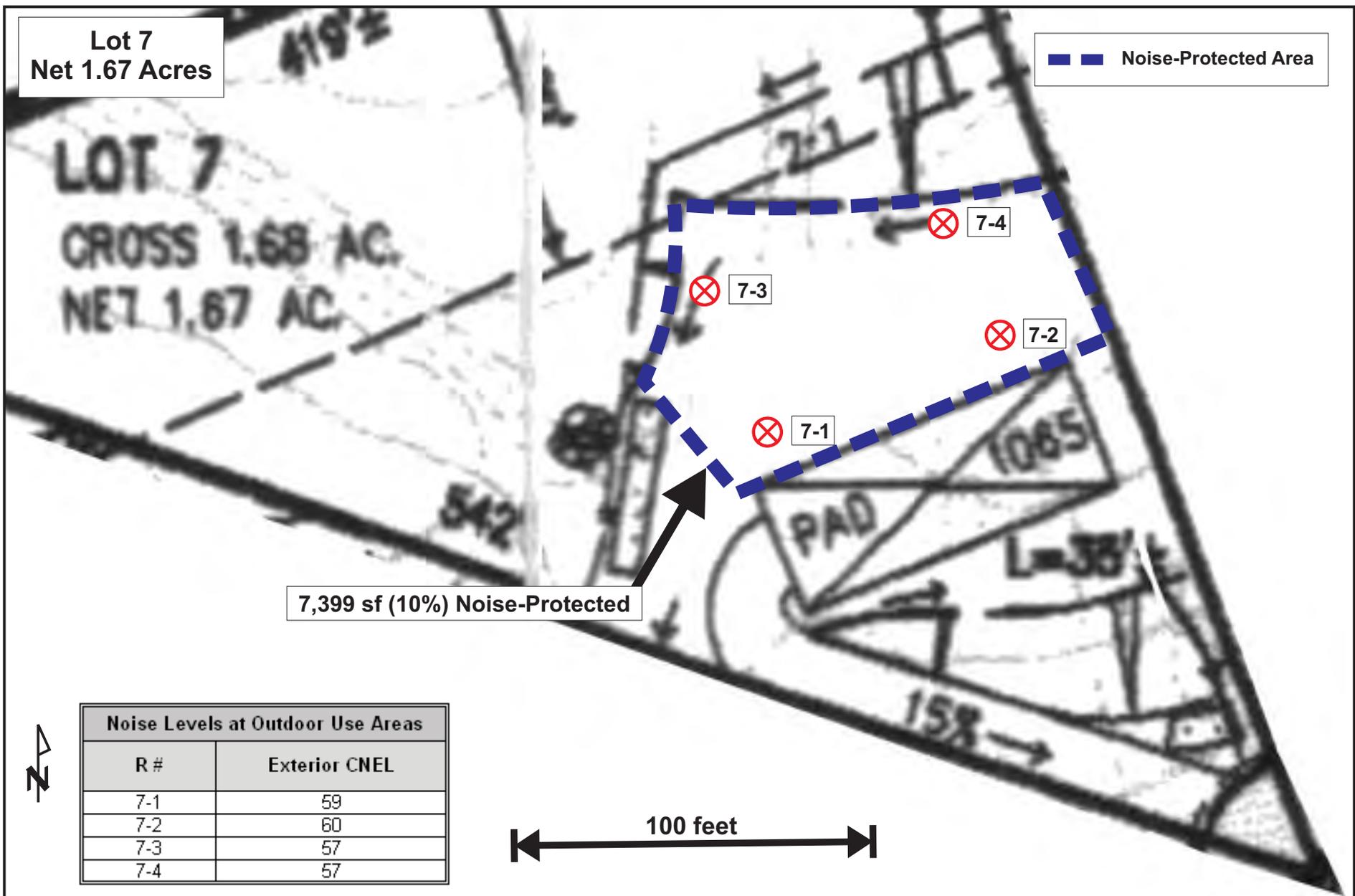
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**Site Plan Showing Future CNEL and Sound
Attenuation Barrier Location - Lot 6**
Job # B21102N1

Figure 11

Lot 7
Net 1.67 Acres

 **Noise-Protected Area**



7,399 sf (10%) Noise-Protected

Noise Levels at Outdoor Use Areas	
R #	Exterior CNEL
7-1	59
7-2	60
7-3	57
7-4	57

100 feet

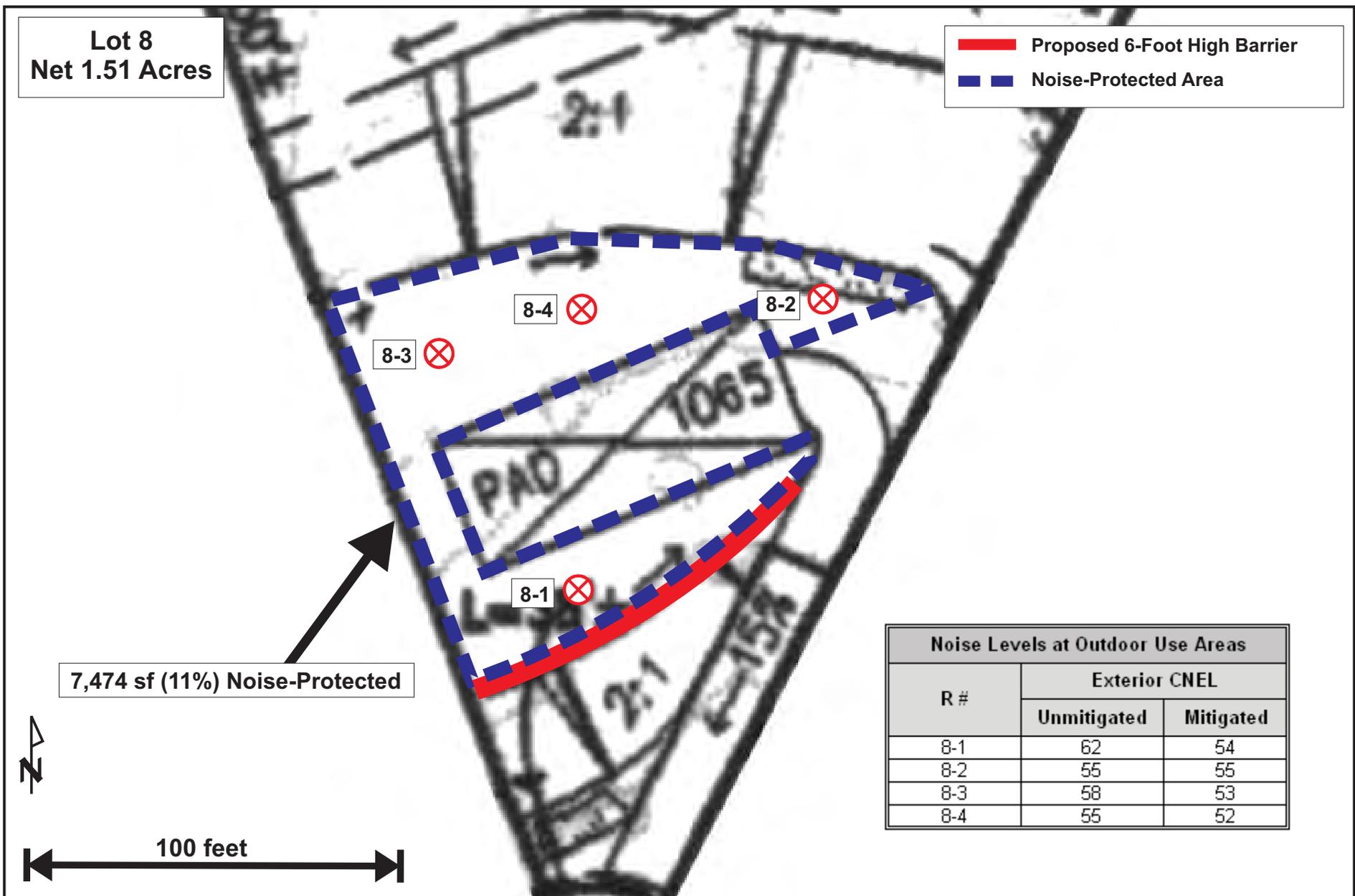
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Site Plan Showing Future CNEL - Lot 7
Job # B21102N1

Figure 12

Lot 8
Net 1.51 Acres

▬ Proposed 6-Foot High Barrier
▬ Noise-Protected Area



7,474 sf (11%) Noise-Protected

Noise Levels at Outdoor Use Areas		
R #	Exterior CNEL	
	Unmitigated	Mitigated
8-1	62	54
8-2	55	55
8-3	58	53
8-4	55	52

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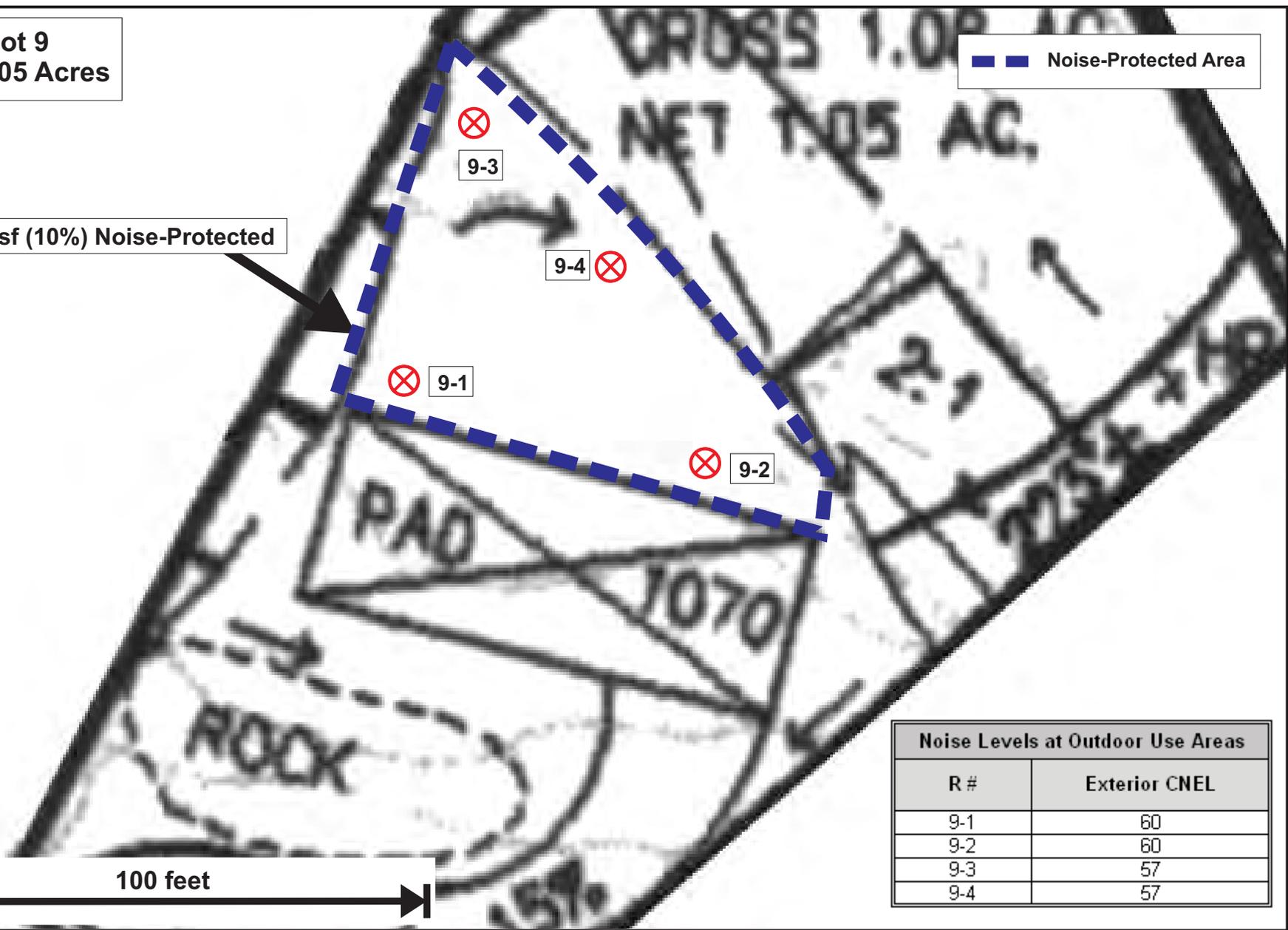
Site Plan Showing Future CNEL and Sound
 Attenuation Barrier Location - Lot 8
 Job # B21102N1

Figure 13

Lot 9
Net 1.05 Acres

■ ■ ■ ■ Noise-Protected Area

4,632 sf (10%) Noise-Protected



Noise Levels at Outdoor Use Areas	
R #	Exterior CNEL
9-1	60
9-2	60
9-3	57
9-4	57

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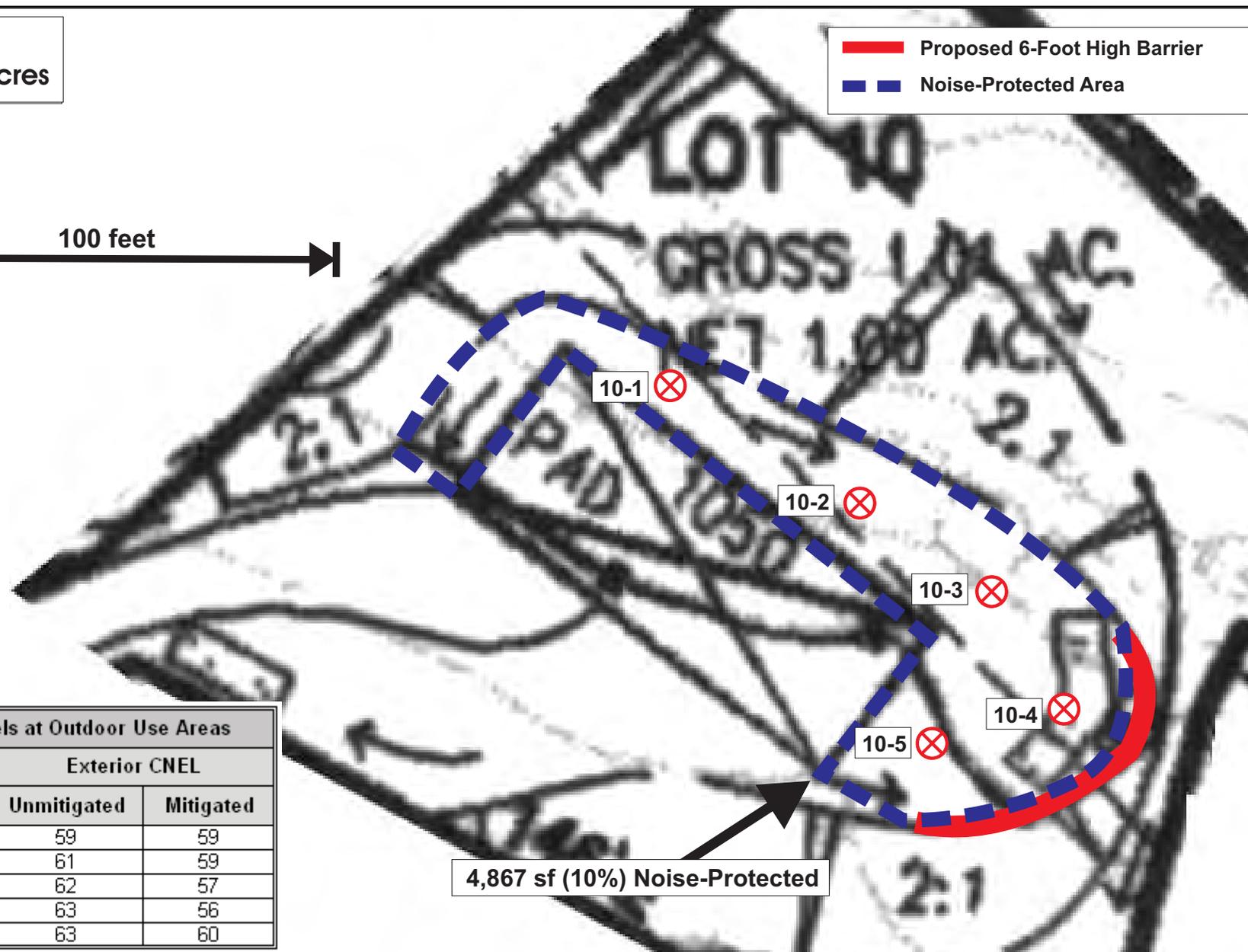
Site Plan Showing Future CNEL - Lot 9
Job # B21102N1

Figure 14

Lot 10
Net 1.00 Acres

█ Proposed 6-Foot High Barrier
█ Noise-Protected Area

100 feet



Noise Levels at Outdoor Use Areas		
R #	Exterior CNEL	
	Unmitigated	Mitigated
10-1	59	59
10-2	61	59
10-3	62	57
10-4	63	56
10-5	63	60

4,867 sf (10%) Noise-Protected

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Site Plan Showing Future CNEL and Sound
 Attenuation Barrier Location - Lot 10
 Job # B21102N1

Figure 15

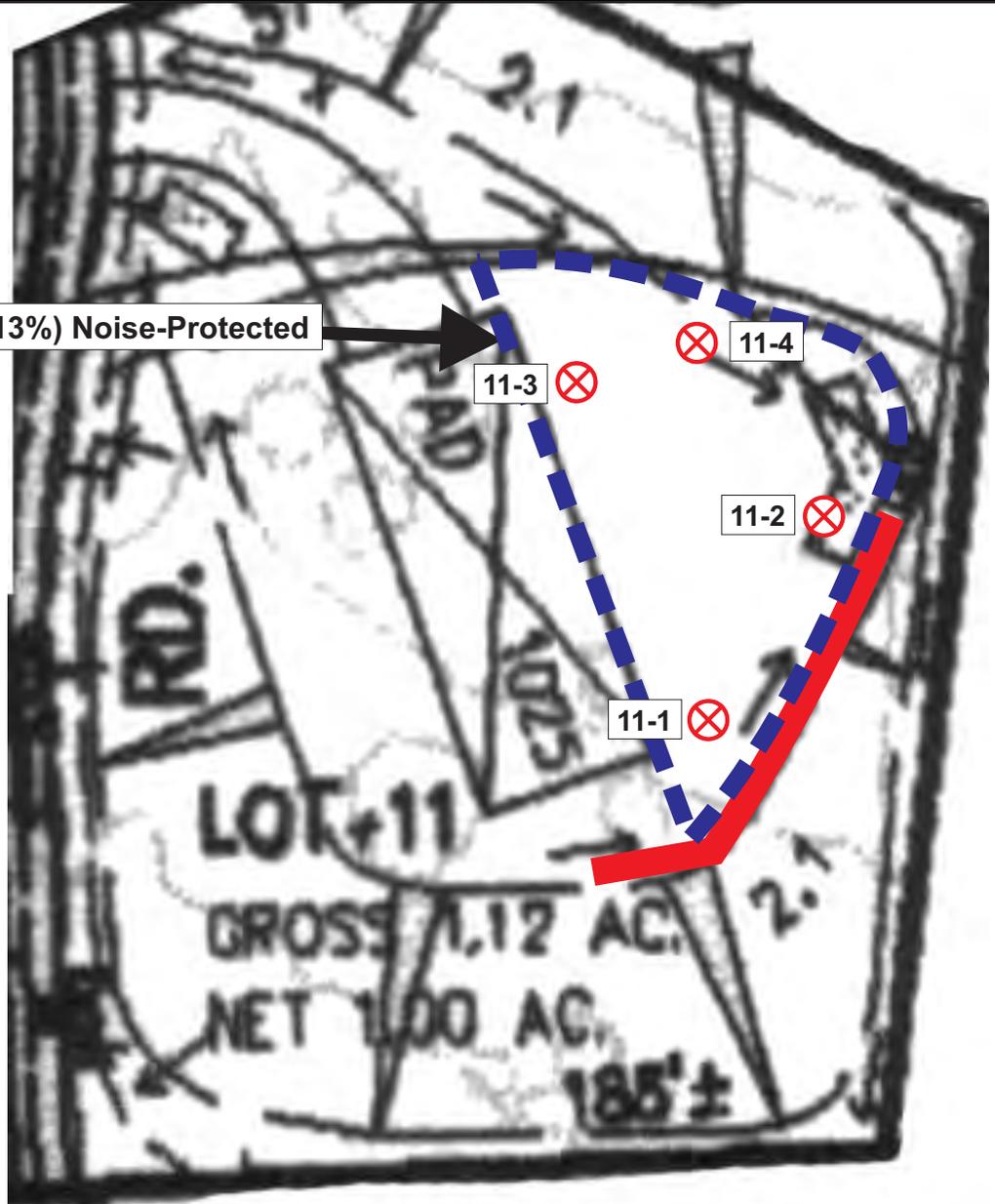
Lot 11
Net 1.00 Acres

- █ Proposed 6-Foot High Barrier
- █ Noise-Protected Area

Noise Levels at Outdoor Use Areas		
R #	Exterior CNEL	
	Unmitigated	Mitigated
11-1	64	59
11-2	62	56
11-3	61	58
11-4	60	57



5,646 sf (13%) Noise-Protected



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Site Plan Showing Future CNEL and Sound
 Attenuation Barrier Location - Lot 11
 Job # B21102N1

Figure 16

APPENDIX A

Project Plans

APPENDIX B

Traffic Noise Model (TNM) Data and Results

INPUT: TRAFFIC FOR LAeq1h Volumes

B21102N1 Oakmont II Subdivision

Eilar Associates, Inc.		4 December 2012											
AH		TNM 2.5											
INPUT: TRAFFIC FOR LAeq1h Volumes		B21102N1 Oakmont II Subdivision											
PROJECT/CONTRACT:		Future Traffic Noise Impacts											
RUN:													
Roadway	Points												
Name	Name	No.	Segment		MTrucks		HTrucks		Buses		Motorcycles		
			Autos		V	S	V	S	V	S	V	S	
			V	S	veh/hr	mph	veh/hr	mph	veh/hr	mph	veh/hr	mph	
I-8 EB	point1	1	2727	65	105	65	97	65	0	0	0	0	
	point2	2	2727	65	105	65	97	65	0	0	0	0	
	point3	3	2727	65	105	65	97	65	0	0	0	0	
	point4	4	2727	65	105	65	97	65	0	0	0	0	
	point20	20	2727	65	105	65	97	65	0	0	0	0	
	point22	22	2727	65	105	65	97	65	0	0	0	0	
I-8 WB	point5	5											
	point6	6	2727	65	105	65	97	65	0	0	0	0	
	point21	21	2727	65	105	65	97	65	0	0	0	0	
	point19	19	2727	65	105	65	97	65	0	0	0	0	
	point7	7	2727	65	105	65	97	65	0	0	0	0	
	point8	8	2727	65	105	65	97	65	0	0	0	0	
Flinn Springs	point9	9	2727	65	105	65	97	65	0	0	0	0	
	point10	10											
	point11	11	177	25	2	25	1	25	0	0	0	0	
	point23	23	177	25	2	25	1	25	0	0	0	0	
	point12	12	177	25	2	25	1	25	0	0	0	0	
	point24	24	177	25	2	25	1	25	0	0	0	0	
Olde 80	point25	25	177	25	2	25	1	25	0	0	0	0	
	point13	13											
	point14	14	567	35	55	35	16	35	0	0	0	0	
	point15	15	567	35	55	35	16	35	0	0	0	0	
	point16	16	567	35	55	35	16	35	0	0	0	0	

INPUT: TRAFFIC FOR LAeq1h Volumes**B21102N1 Oakmont II Subdivision**

	point17	17	567	35	55	35	16	35	0	0	0	0
	point18	18										

INPUT: TERRAIN LINES

B21102N1 Oakmont II Subdivision

Eilar Associates, Inc.		4 December 2012		
AH		TNM 2.5		
INPUT: TERRAIN LINES				
PROJECT/CONTRACT:		B21102N1 Oakmont II Subdivision		
RUN:		Future Traffic Noise Impacts		
Terrain Line	Points			
Name	No.	Coordinates (ground)		
		X	Y	Z
		ft	ft	ft
FS Berm	1	-175.0	-46.4	915.00
	2	0.0	-12.0	926.00
	3	512.5	-8.0	935.00
I-8 Berm	4	-1,077.0	22.1	904.00
	5	-547.0	-46.3	912.00
	6	0.0	-114.7	913.00
	7	547.0	-188.5	923.00
	8	1,094.0	-279.8	950.00
West Hill Ridge	9	-263.0	644.0	950.00
	10	-100.0	656.0	1,005.00
	11	119.0	675.0	1,100.00
	12	288.0	675.0	1,150.00
	13	431.0	650.0	1,200.00
	14	638.0	650.0	1,245.00
	15	831.0	625.0	1,200.00
	16	1,050.0	569.0	1,150.00
	17	1,212.7	644.1	1,100.00
	18	1,490.4	592.6	1,050.00
	19	1,813.0	294.0	1,000.00
West Hill Base	20	-250.0	600.0	955.00
	21	-138.0	363.0	945.00
	22	75.0	100.0	930.00
	23	288.0	13.0	930.00
	24	563.0	69.0	950.00

INPUT: TERRAIN LINES

	25	863.0	194.0	1,010.00
	26	1,384.5	206.4	990.00
	27	1,732.2	307.1	1,000.00
East Hill Ridge	28	1,688.0	1,283.0	1,040.00
	29	2,000.0	1,063.0	1,170.00
	30	2,094.0	1,094.0	1,185.00
	31	2,400.0	1,169.0	1,170.00
	32	2,519.0	1,288.0	1,150.00
	33	2,721.0	1,413.0	1,100.00
	34	2,813.0	1,500.0	1,080.00
	35	2,975.0	1,513.0	1,070.00
East Hill Base	36	1,895.6	343.2	1,000.00
	37	2,051.0	366.0	1,000.00
	38	2,100.0	600.0	1,080.00
	39	2,363.0	606.0	1,080.00
	40	2,650.0	713.0	1,080.00
	41	2,833.0	1,038.0	1,110.00
	42	2,975.0	1,438.0	1,080.00

B21102N1 Oakmont II Subdivision

INPUT: RECEIVERS

B21102N1 Oakmont II Subdivision

23	76	1	0.0	600.0	1,043.66	5.00	0.00	66	10.0	8.0	Y
24	77	1	400.0	600.0	1,175.74	5.00	0.00	66	10.0	8.0	Y
25	78	1	800.0	600.0	1,199.82	5.00	0.00	66	10.0	8.0	Y
26	79	1	1,200.0	600.0	1,104.48	5.00	0.00	66	10.0	8.0	Y
27	80	1	1,600.0	600.0	1,061.75	5.00	0.00	66	10.0	8.0	Y
28	81	1	2,000.0	600.0	1,080.35	5.00	0.00	66	10.0	8.0	Y
29	82	1	-400.0	800.0	941.63	5.00	0.00	66	10.0	8.0	Y
30	83	1	0.0	800.0	966.79	5.00	0.00	66	10.0	8.0	Y
31	84	1	400.0	800.0	1,068.97	5.00	0.00	66	10.0	8.0	Y
32	85	1	800.0	800.0	1,182.15	5.00	0.00	66	10.0	8.0	Y
33	86	1	1,200.0	800.0	1,124.68	5.00	0.00	66	10.0	8.0	Y
34	87	1	1,600.0	800.0	1,069.03	5.00	0.00	66	10.0	8.0	Y
35	88	1	2,000.0	800.0	1,121.24	5.00	0.00	66	10.0	8.0	Y
36	89	1	-400.0	1,000.0	941.63	5.00	0.00	66	10.0	8.0	Y
37	90	1	0.0	1,000.0	965.81	5.00	0.00	66	10.0	8.0	Y
38	91	1	400.0	1,000.0	984.91	5.00	0.00	66	10.0	8.0	Y
39	92	1	800.0	1,000.0	1,004.00	5.00	0.00	66	10.0	8.0	Y
40	93	1	1,200.0	1,000.0	1,132.53	5.00	0.00	66	10.0	8.0	Y
41	94	1	1,600.0	1,000.0	1,050.29	5.00	0.00	66	10.0	8.0	Y
42	95	1	2,000.0	1,000.0	1,162.12	5.00	0.00	66	10.0	8.0	Y
Calibration	97	1	0.0	19.0	933.00	5.00	0.00	66	10.0	8.0	Y

RESULTS: SOUND LEVELS

B21102N1 Oakmont II Subdivision

25	78	1	0.0	64.7	66	64.7	10	----	64.7	0.0	8	-8.0
26	79	1	0.0	64.2	66	64.2	10	----	64.2	0.0	8	-8.0
27	80	1	0.0	63.3	66	63.3	10	----	63.3	0.0	8	-8.0
28	81	1	0.0	64.3	66	64.3	10	----	64.3	0.0	8	-8.0
29	82	1	0.0	57.3	66	57.3	10	----	57.3	0.0	8	-8.0
30	83	1	0.0	39.1	66	39.1	10	----	39.1	0.0	8	-8.0
31	84	1	0.0	35.5	66	35.5	10	----	35.5	0.0	8	-8.0
32	85	1	0.0	55.3	66	55.3	10	----	55.3	0.0	8	-8.0
33	86	1	0.0	60.3	66	60.3	10	----	60.3	0.0	8	-8.0
34	87	1	0.0	60.0	66	60.0	10	----	60.0	0.0	8	-8.0
35	88	1	0.0	62.6	66	62.6	10	----	62.6	0.0	8	-8.0
36	89	1	0.0	54.2	66	54.2	10	----	54.2	0.0	8	-8.0
37	90	1	0.0	49.0	66	49.0	10	----	49.0	0.0	8	-8.0
38	91	1	0.0	36.1	66	36.1	10	----	36.1	0.0	8	-8.0
39	92	1	0.0	39.8	66	39.8	10	----	39.8	0.0	8	-8.0
40	93	1	0.0	58.2	66	58.2	10	----	58.2	0.0	8	-8.0
41	94	1	0.0	53.6	66	53.6	10	----	53.6	0.0	8	-8.0
42	95	1	0.0	61.1	66	61.1	10	----	61.1	0.0	8	-8.0
Calibration	97	1	0.0	72.8	66	72.8	10	Snd Lvl	72.8	0.0	8	-8.0
Dwelling Units		# DUs	Noise Reduction									
			Min	Avg	Max							
			dB	dB	dB							
All Selected		43	0.0	0.0	0.0							
All Impacted		19	0.0	0.0	0.0							
All that meet NR Goal		0	0.0	0.0	0.0							

INPUT: RECEIVERS**B21102N1 Oakmont II Subdivision**

23	76	1	0.0	600.0	1,043.66	15.00	0.00	66	10.0	8.0	Y
24	77	1	400.0	600.0	1,175.74	15.00	0.00	66	10.0	8.0	Y
25	78	1	800.0	600.0	1,199.82	15.00	0.00	66	10.0	8.0	Y
26	79	1	1,200.0	600.0	1,104.48	15.00	0.00	66	10.0	8.0	Y
27	80	1	1,600.0	600.0	1,061.75	15.00	0.00	66	10.0	8.0	Y
28	81	1	2,000.0	600.0	1,080.35	15.00	0.00	66	10.0	8.0	Y
29	82	1	-400.0	800.0	941.63	15.00	0.00	66	10.0	8.0	Y
30	83	1	0.0	800.0	966.79	15.00	0.00	66	10.0	8.0	Y
31	84	1	400.0	800.0	1,068.97	15.00	0.00	66	10.0	8.0	Y
32	85	1	800.0	800.0	1,182.15	15.00	0.00	66	10.0	8.0	Y
33	86	1	1,200.0	800.0	1,124.68	15.00	0.00	66	10.0	8.0	Y
34	87	1	1,600.0	800.0	1,069.03	15.00	0.00	66	10.0	8.0	Y
35	88	1	2,000.0	800.0	1,121.24	15.00	0.00	66	10.0	8.0	Y
36	89	1	-400.0	1,000.0	941.63	15.00	0.00	66	10.0	8.0	Y
37	90	1	0.0	1,000.0	965.81	15.00	0.00	66	10.0	8.0	Y
38	91	1	400.0	1,000.0	984.91	15.00	0.00	66	10.0	8.0	Y
39	92	1	800.0	1,000.0	1,004.00	15.00	0.00	66	10.0	8.0	Y
40	93	1	1,200.0	1,000.0	1,132.53	15.00	0.00	66	10.0	8.0	Y
41	94	1	1,600.0	1,000.0	1,050.29	15.00	0.00	66	10.0	8.0	Y
42	95	1	2,000.0	1,000.0	1,162.12	15.00	0.00	66	10.0	8.0	Y

RESULTS: SOUND LEVELS

B21102N1 Oakmont II Subdivision

25	78	1	0.0	64.8	66	64.8	10	----	64.8	0.0	8	-8.0
26	79	1	0.0	64.5	66	64.5	10	----	64.5	0.0	8	-8.0
27	80	1	0.0	64.2	66	64.2	10	----	64.2	0.0	8	-8.0
28	81	1	0.0	64.9	66	64.9	10	----	64.9	0.0	8	-8.0
29	82	1	0.0	59.3	66	59.3	10	----	59.3	0.0	8	-8.0
30	83	1	0.0	42.5	66	42.5	10	----	42.5	0.0	8	-8.0
31	84	1	0.0	37.0	66	37.0	10	----	37.0	0.0	8	-8.0
32	85	1	0.0	56.4	66	56.4	10	----	56.4	0.0	8	-8.0
33	86	1	0.0	61.0	66	61.0	10	----	61.0	0.0	8	-8.0
34	87	1	0.0	61.3	66	61.3	10	----	61.3	0.0	8	-8.0
35	88	1	0.0	63.0	66	63.0	10	----	63.0	0.0	8	-8.0
36	89	1	0.0	56.2	66	56.2	10	----	56.2	0.0	8	-8.0
37	90	1	0.0	50.6	66	50.6	10	----	50.6	0.0	8	-8.0
38	91	1	0.0	37.1	66	37.1	10	----	37.1	0.0	8	-8.0
39	92	1	0.0	41.9	66	41.9	10	----	41.9	0.0	8	-8.0
40	93	1	0.0	58.7	66	58.7	10	----	58.7	0.0	8	-8.0
41	94	1	0.0	55.7	66	55.7	10	----	55.7	0.0	8	-8.0
42	95	1	0.0	61.5	66	61.5	10	----	61.5	0.0	8	-8.0
Dwelling Units		# DUs	Noise Reduction									
			Min	Avg	Max							
			dB	dB	dB							
All Selected		42	0.0	0.0	0.0							
All Impacted		20	0.0	0.0	0.0							
All that meet NR Goal		0	0.0	0.0	0.0							

INPUT: TERRAIN LINES

B21102N1 Oakmont II Subdivision

Eilar Associates, Inc.		4 December 2012		
AH		TNM 2.5		
INPUT: TERRAIN LINES				
PROJECT/CONTRACT:		B21102N1 Oakmont II Subdivision		
RUN:		Future Traffic Noise-Unmitigated at Lots		
Terrain Line	Points			
Name	No.	Coordinates (ground)		
		X	Y	Z
		ft	ft	ft
FS Berm	1	-175.0	-46.4	915.00
	2	0.0	-12.0	926.00
	3	512.5	-8.0	935.00
I-8 Berm	4	-1,077.0	22.1	904.00
	5	-547.0	-46.3	912.00
	6	0.0	-114.7	913.00
	7	547.0	-188.5	923.00
	8	1,094.0	-279.8	950.00
West Hill Ridge	9	-263.0	644.0	950.00
	10	-100.0	656.0	1,005.00
	11	119.0	675.0	1,100.00
	12	288.0	675.0	1,150.00
	13	431.0	650.0	1,200.00
	14	638.0	650.0	1,245.00
	15	831.0	625.0	1,200.00
	16	1,050.0	569.0	1,150.00
	17	1,212.7	644.1	1,100.00
	18	1,490.4	592.6	1,050.00
	19	1,813.0	294.0	1,000.00
West Hill Base	20	-250.0	600.0	955.00
	21	-138.0	363.0	945.00
	22	75.0	100.0	930.00
	23	288.0	13.0	930.00
	24	563.0	69.0	950.00

INPUT: TERRAIN LINES

B21102N1 Oakmont II Subdivision

	25	863.0	194.0	1,010.00
	26	1,384.5	206.4	990.00
	27	1,732.2	307.1	1,000.00
East Hill Ridge	28	1,688.0	1,283.0	1,040.00
	29	2,000.0	1,063.0	1,170.00
	30	2,094.0	1,094.0	1,185.00
	31	2,400.0	1,169.0	1,170.00
	32	2,519.0	1,288.0	1,150.00
	33	2,721.0	1,413.0	1,100.00
	34	2,813.0	1,500.0	1,080.00
	35	2,975.0	1,513.0	1,070.00
East Hill Base	36	1,895.6	343.2	1,000.00
	37	2,051.0	366.0	1,000.00
	38	2,100.0	600.0	1,080.00
	39	2,363.0	606.0	1,080.00
	40	2,650.0	713.0	1,080.00
	41	2,833.0	1,038.0	1,110.00
	42	2,975.0	1,438.0	1,080.00
Lot 2 Pad	43	32.4	210.3	953.00
	44	33.2	193.3	953.00
	45	52.4	170.4	953.00
	46	101.2	146.7	953.00
	47	158.9	120.8	953.00
	48	182.6	131.9	953.00
	49	193.0	160.0	953.00
	50	196.7	186.4	953.00
Lot 2-2	54	60.0	230.0	961.00
	55	108.1	237.8	961.00
	56	171.1	223.3	961.00
	57	194.1	211.8	961.00
	58	197.4	210.0	961.00
	59	194.5	189.0	961.00
Lot 3 Pad	60	304.7	128.9	950.00
	61	291.0	125.5	950.00
	62	283.2	105.2	950.00
	63	280.3	83.1	950.00

INPUT: TERRAIN LINES

B21102N1 Oakmont II Subdivision

	64	296.6	69.7	950.00
	65	380.2	60.9	950.00
	66	438.6	57.2	950.00
	160	449.5	57.4	950.00
	67	455.6	72.7	950.00
	159	451.9	99.3	950.00
	68	435.5	113.8	950.00
	158	420.7	120.6	950.00
	69	399.1	124.1	950.00
	157	343.9	127.4	950.00
	70	305.4	130.4	950.00
Lot 4 Pad	71	1,595.3	442.0	1,020.00
	72	1,505.1	405.0	1,020.00
	73	1,440.7	382.0	1,020.00
	74	1,418.5	365.8	1,020.00
	75	1,421.5	346.5	1,020.00
	76	1,448.8	333.9	1,020.00
	77	1,522.8	333.2	1,020.00
	78	1,582.7	347.3	1,020.00
	79	1,619.7	368.7	1,020.00
	80	1,628.6	403.5	1,020.00
	81	1,626.4	427.9	1,020.00
	82	1,595.3	442.0	1,020.00
Lot 5 Pad	83	1,420.8	581.9	1,060.00
	84	1,387.9	571.9	1,060.00
	85	1,391.4	502.7	1,060.00
	86	1,398.5	464.5	1,060.00
	87	1,407.9	463.3	1,060.00
	88	1,470.1	492.1	1,060.00
	89	1,516.5	504.4	1,060.00
	90	1,515.9	534.9	1,060.00
	91	1,521.2	547.9	1,060.00
	92	1,487.1	572.5	1,060.00
	93	1,444.3	587.2	1,060.00
	94	1,423.7	582.5	1,060.00
Lot 6 Pad	95	1,264.6	605.4	1,090.00

INPUT: TERRAIN LINES

B21102N1 Oakmont II Subdivision

	96	1,231.7	621.9	1,090.00
	97	1,214.7	624.8	1,090.00
	98	1,138.3	523.8	1,090.00
	99	1,167.7	506.8	1,090.00
	100	1,232.9	476.2	1,090.00
	101	1,289.8	474.5	1,090.00
	102	1,319.8	493.3	1,090.00
	103	1,339.1	533.8	1,090.00
	104	1,332.7	580.2	1,090.00
	107	1,310.4	600.7	1,090.00
	105	1,265.7	603.1	1,090.00
Lot 7 Pad	108	1,417.2	618.3	1,065.00
	109	1,497.1	641.2	1,065.00
	110	1,558.8	665.9	1,065.00
	111	1,498.9	769.8	1,065.00
	112	1,447.2	748.7	1,065.00
	113	1,392.6	745.8	1,065.00
	114	1,387.9	624.2	1,065.00
	115	1,412.5	617.7	1,065.00
Lot 8 Pad	116	1,561.1	668.8	1,065.00
	117	1,501.2	772.2	1,065.00
	118	1,567.0	798.6	1,065.00
	119	1,615.1	804.5	1,065.00
	120	1,668.6	802.1	1,065.00
	121	1,673.9	793.3	1,065.00
	122	1,662.7	755.2	1,065.00
	123	1,629.8	731.1	1,065.00
	124	1,577.0	675.3	1,065.00
	125	1,563.5	669.4	1,065.00
Lot 9 Pad	126	1,643.9	673.5	1,070.00
	127	1,714.4	666.5	1,070.00
	128	1,766.1	659.4	1,070.00
	129	1,798.9	697.0	1,070.00
	130	1,752.0	753.4	1,070.00
	131	1,681.5	808.0	1,070.00
	132	1,644.5	675.9	1,070.00

INPUT: TERRAIN LINES

Lot 10 Pad	133	1,783.1	638.3	1,050.00
	134	1,766.6	577.8	1,050.00
	135	1,808.9	560.8	1,050.00
	136	1,851.2	580.2	1,050.00
	137	1,901.1	579.0	1,050.00
	138	1,946.9	590.1	1,050.00
	139	1,954.5	604.8	1,050.00
	140	1,942.8	631.3	1,050.00
	141	1,895.8	657.1	1,050.00
	142	1,834.8	675.3	1,050.00
	143	1,809.5	676.5	1,050.00
	144	1,794.8	654.7	1,050.00
	145	1,786.0	639.5	1,050.00
Lot 11 Pad	146	1,706.7	499.1	1,025.00
	147	1,757.2	513.8	1,025.00
	148	1,823.0	520.3	1,025.00
	149	1,849.4	513.2	1,025.00
	150	1,867.6	483.9	1,025.00
	151	1,850.0	424.6	1,025.00
	152	1,839.5	394.0	1,025.00
	153	1,802.5	384.6	1,025.00
	154	1,766.6	383.4	1,025.00
	155	1,743.7	409.9	1,025.00
	156	1,704.4	494.4	1,025.00
Lot 2 Pad-2	161	185.9	189.8	953.00
	51	124.9	213.3	953.00
	52	59.1	228.8	953.00
	53	33.9	213.3	953.00

B21102N1 Oakmont II Subdivision

INPUT: RECEIVERS**B21102N1 Oakmont II Subdivision**

7-1	69	1	1,427.0	681.0	1,065.00	5.00	0.00	66	10.0	8.0	Y
7-2	70	1	1,493.0	717.0	1,065.00	5.00	0.00	66	10.0	8.0	Y
7-3	71	1	1,407.0	728.0	1,065.00	5.00	0.00	66	10.0	8.0	Y
7-4	72	1	1,474.0	750.0	1,065.00	5.00	0.00	66	10.0	8.0	Y
8-1	73	1	1,582.5	698.0	1,065.00	5.00	0.00	66	10.0	8.0	Y
8-2	74	1	1,658.0	783.0	1,065.00	5.00	0.00	66	10.0	8.0	Y
8-3	75	1	1,537.0	758.0	1,065.00	5.00	0.00	66	10.0	8.0	Y
8-4	76	1	1,591.0	789.0	1,065.00	5.00	0.00	66	10.0	8.0	Y
9-1	77	1	1,678.0	737.0	1,070.00	5.00	0.00	66	10.0	8.0	Y
9-2	78	1	1,745.0	734.0	1,070.00	5.00	0.00	66	10.0	8.0	Y
9-3	79	1	1,683.0	781.0	1,070.00	5.00	0.00	66	10.0	8.0	Y
9-4	80	1	1,718.0	767.0	1,070.00	5.00	0.00	66	10.0	8.0	Y
10-1	81	1	1,836.0	664.0	1,050.00	5.00	0.00	66	10.0	8.0	Y
10-2	82	1	1,889.0	642.0	1,050.00	5.00	0.00	66	10.0	8.0	Y
10-3	83	1	1,926.0	622.0	1,050.00	5.00	0.00	66	10.0	8.0	Y
10-4	84	1	1,929.0	601.0	1,050.00	5.00	0.00	66	10.0	8.0	Y
10-5	85	1	1,904.0	591.0	1,050.00	5.00	0.00	66	10.0	8.0	Y
11-1	86	1	1,834.0	428.0	1,025.00	5.00	0.00	66	10.0	8.0	Y
11-2	87	1	1,852.0	471.0	1,025.00	5.00	0.00	66	10.0	8.0	Y
11-3	88	1	1,800.0	486.0	1,025.00	5.00	0.00	66	10.0	8.0	Y
11-4	89	1	1,812.0	506.0	1,025.00	5.00	0.00	66	10.0	8.0	Y

RESULTS: SOUND LEVELS

B21102N1 Oakmont II Subdivision

7-3	71	1	0.0	55.0	66	55.0	10	----	55.0	0.0	8	-8.0
7-4	72	1	0.0	55.1	66	55.1	10	----	55.1	0.0	8	-8.0
8-1	73	1	0.0	59.9	66	59.9	10	----	59.9	0.0	8	-8.0
8-2	74	1	0.0	53.0	66	53.0	10	----	53.0	0.0	8	-8.0
8-3	75	1	0.0	55.6	66	55.6	10	----	55.6	0.0	8	-8.0
8-4	76	1	0.0	53.2	66	53.2	10	----	53.2	0.0	8	-8.0
9-1	77	1	0.0	58.1	66	58.1	10	----	58.1	0.0	8	-8.0
9-2	78	1	0.0	57.6	66	57.6	10	----	57.6	0.0	8	-8.0
9-3	79	1	0.0	54.5	66	54.5	10	----	54.5	0.0	8	-8.0
9-4	80	1	0.0	55.1	66	55.1	10	----	55.1	0.0	8	-8.0
10-1	81	1	0.0	57.4	66	57.4	10	----	57.4	0.0	8	-8.0
10-2	82	1	0.0	58.9	66	58.9	10	----	58.9	0.0	8	-8.0
10-3	83	1	0.0	59.9	66	59.9	10	----	59.9	0.0	8	-8.0
10-4	84	1	0.0	60.8	66	60.8	10	----	60.8	0.0	8	-8.0
10-5	85	1	0.0	61.2	66	61.2	10	----	61.2	0.0	8	-8.0
11-1	86	1	0.0	61.9	66	61.9	10	----	61.9	0.0	8	-8.0
11-2	87	1	0.0	60.1	66	60.1	10	----	60.1	0.0	8	-8.0
11-3	88	1	0.0	58.5	66	58.5	10	----	58.5	0.0	8	-8.0
11-4	89	1	0.0	57.9	66	57.9	10	----	57.9	0.0	8	-8.0
Dwelling Units		# DUs	Noise Reduction									
			Min	Avg	Max							
			dB	dB	dB							
All Selected		43	0.0	0.0	0.0							
All Impacted		5	0.0	0.0	0.0							
All that meet NR Goal		0	0.0	0.0	0.0							

Eilar Associates, Inc.	4 December 2012
AH	TNM 2.5

INPUT: BARRIERS

PROJECT/CONTRACT: B21102N1 Oakmont II Subdivision
 RUN: Future Traffic Noise-Lot 2 Mitigated

Barrier									Points										
Name	Type	Height		If Wall	If Berm	Run:Rise		Add'tnl	Name	No.	Coordinates (bottom)			Height	Segment				
		Min	Max	\$ per	\$ per	Top	ft:ft	\$ per			X	Y	Z	at	Seg	Ht	Perturbs	On	Important
		ft	ft	Unit	Unit	Width		Unit			ft	ft	ft	ft	Incre-	#Up	#Dn	Struct?	Reflec-
				Area	Vol.			Length						Point	ment				tions?
				\$/sq ft	\$/cu yd			\$/ft							ft				
Lot 2 Residence	W	0.00	99.99	0.00				0.00	point5	5	71.0	212.7	953.00	15.00	0.00	0	0		
									point6	6	165.3	179.2	953.00	15.00	0.00	0	0		
									point7	7	151.5	141.3	953.00	15.00	0.00	0	0		
									point8	8	58.7	176.9	953.00	15.00	0.00	0	0		
									point9	9	71.0	212.7	953.00	15.00					
Lot 2 Barrier	W	0.00	99.99	0.00				0.00	point10	10	55.5	224.4	953.00	8.00	0.00	0	0		
									point18	18	41.4	216.3	953.00	8.00	0.00	0	0		
									point11	11	35.2	203.3	953.00	8.00	0.00	0	0		
									point20	20	37.4	194.1	953.00	8.00	0.00	0	0		
									point19	19	51.8	176.3	953.00	8.00	0.00	0	0		
									point21	21	67.7	165.6	953.00	8.00	0.00	0	0		
									point12	12	127.0	137.4	953.00	8.00	0.00	0	0		
									point22	22	149.2	129.3	953.00	8.00	0.00	0	0		
									point13	13	172.1	130.8	953.00	8.00	0.00	0	0		
									point23	23	183.2	140.0	953.00	8.00	0.00	0	0		
									point14	14	193.2	185.6	953.00	8.00	0.00	0	0		
									point15	15	193.2	186.7	953.00	10.00	0.00	0	0		
									point17	17	193.0	211.0	961.00	10.00	0.00	0	0		
									point16	16	171.6	222.0	961.00	10.00					

INPUT: BARRIERS

B21102N1 Oakmont II Subdivision

Eilar Associates, Inc.	4 December 2012
AH	TNM 2.5

INPUT: BARRIERS

PROJECT/CONTRACT: B21102N1 Oakmont II Subdivision
 RUN: Future Traffic Noise-Lot 3 Mitigated

Barrier									Points										
Name	Type	Height		If Wall	If Berm			Add'tnl	Name	No.	Coordinates (bottom)			Height	Segment				
		Min	Max	\$ per	\$ per	Top	Run:Rise	\$ per			X	Y	Z	at	Seg	Ht	Perturbs	On	Important
				Unit	Unit	Width		Unit						Point	Incre-	#Up	#Dn	Struct?	Reflec-
		ft	ft	Area	Vol.			Length			ft	ft	ft	ft	ment				tions?
				\$/sq ft	\$/cu yd	ft	ft:ft	\$/ft							ft				
Lot 3 Barrier	W	0.00	99.99	0.00				0.00	point25	25	288.9	112.1	950.00	9.00	0.00	0	0		
									point24	24	283.6	88.0	950.00	9.00	0.00	0	0		
									point19	19	301.3	75.6	950.00	9.00	0.00	0	0		
									point20	20	441.4	60.6	950.00	9.00	0.00	0	0		
									point21	21	451.1	71.2	950.00	9.00	0.00	0	0		
									point22	22	445.8	102.1	950.00	9.00	0.00	0	0		
									point23	23	429.9	114.4	950.00	9.00					

INPUT: BARRIERS

B21102N1 Oakmont II Subdivision

Eilar Associates, Inc.	4 December 2012
AH	TNM 2.5

INPUT: BARRIERS

PROJECT/CONTRACT: B21102N1 Oakmont II Subdivision
 RUN: Future Traffic Noise-Lot 4 Mitigated

Barrier									Points										
Name	Type	Height		If Wall	If Berm			Add'tnl	Name	No.	Coordinates (bottom)			Height	Segment				
		Min	Max	\$ per	\$ per	Top	Run:Rise	\$ per			X	Y	Z	at	Seg	Ht	Perturbs	On	Important
				Unit	Unit	Width		Unit						Point	Incre-	#Up	#Dn	Struct?	Reflec-
		ft	ft	Area	Vol.		ft:ft	Length			ft	ft	ft	ft	ment				tions?
				\$/sq ft	\$/cu yd			\$/ft							ft				
Lot 4 Barrier	W	0.00	99.99	0.00				0.00	point27	27	1,450.1	336.0	1,020.00	6.00	0.00	0	0		
									point28	28	1,519.3	335.5	1,020.00	6.00	0.00	0	0		
									point29	29	1,578.4	348.1	1,020.00	6.00	0.00	0	0		
									point30	30	1,615.6	369.4	1,020.00	6.00	0.00	0	0		
									point31	31	1,625.3	404.7	1,020.00	6.00					

RESULTS: SOUND LEVELS

B21102N1 Oakmont II Subdivision

Eilar Associates, Inc.										4 December 2012			
AH										TNM 2.5			
										Calculated with TNM 2.5			
RESULTS: SOUND LEVELS													
PROJECT/CONTRACT:		B21102N1 Oakmont II Subdivision											
RUN:		Future Traffic Noise-Lot 4 Mitigated											
BARRIER DESIGN:		INPUT HEIGHTS										Average pavement type shall be used unless a State highway agency substantiates the use of a different type with approval of FHWA.	
ATMOSPHERICS:		68 deg F, 50% RH											
Receiver													
Name		No.	#DUs	Existing LAeq1h	No Barrier LAeq1h Calculated	Crit'n	Increase over existing		Type Impact	With Barrier			
							Calculated	Crit'n		Calculated LAeq1h	Noise Reduction		Calculated minus Goal
								Sub'l Inc			Calculated	Goal	Calculated minus Goal
				dB	dB	dB	dB	dB		dB	dB	dB	dB
4-1		43	1	0.0	58.4	66	58.4	10	----	58.4	0.0	8	-8.0
4-2		44	1	0.0	57.4	66	57.4	10	----	57.4	0.0	8	-8.0
4-3		45	1	0.0	57.2	66	57.2	10	----	57.2	0.0	8	-8.0
4-4		46	1	0.0	56.0	66	56.0	10	----	56.0	0.0	8	-8.0
Dwelling Units		# DUs	Noise Reduction										
			Min	Avg	Max								
			dB	dB	dB								
All Selected		4	0.0	0.0	0.0								
All Impacted		0	0.0	0.0	0.0								
All that meet NR Goal		0	0.0	0.0	0.0								

INPUT: BARRIERS

B21102N1 Oakmont II Subdivision

Eilar Associates, Inc.	4 December 2012
AH	TNM 2.5

INPUT: BARRIERS

PROJECT/CONTRACT: B21102N1 Oakmont II Subdivision
 RUN: Future Traffic Noise-Lot 5 Mitigated

Barrier									Points										
Name	Type	Height		If Wall	If Berm			Add'tnl	Name	No.	Coordinates (bottom)			Height	Segment				
		Min	Max	\$ per Unit	\$ per Unit	Top Width	Run:Rise	\$ per Unit			X	Y	Z	at Point	Seg	Ht	Perturbs	On	Important
		ft	ft	\$/sq ft	\$/cu yd	ft	ft:ft	\$/ft			ft	ft	ft	ft	ft				
Lot 5 Barrier	W	0.00	99.99	0.00				0.00	point35	35	1,428.0	480.5	1,060.00	6.00	0.00	0	0		
									point36	36	1,516.0	545.6	1,060.00	6.00	0.00	0	0		
									point37	37	1,478.0	569.3	1,060.00	6.00					

INPUT: BARRIERS

B21102N1 Oakmont II Subdivision

Eilar Associates, Inc.	4 December 2012
AH	TNM 2.5

INPUT: BARRIERS

PROJECT/CONTRACT: B21102N1 Oakmont II Subdivision
 RUN: Future Traffic Noise-Lot 6 Mitigated

Barrier									Points										
Name	Type	Height		If Wall	If Berm			Add'tnl	Name	No.	Coordinates (bottom)			Height	Segment				
		Min	Max	\$ per Unit	\$ per Unit	Top Width	Run:Rise	\$ per Unit			X	Y	Z	at Point	Seg	Ht	Perturbs	On	Important
		ft	ft	\$/sq ft	\$/cu yd	ft	ft:ft	\$/ft			ft	ft	ft	ft	ft				
Lot 6 Barrier	W	0.00	99.99	0.00				0.00	point38	38	1,332.6	533.9	1,090.00	6.00	0.00	0	0		
									point39	39	1,316.4	498.0	1,090.00	6.00	0.00	0	0		
									point41	41	1,288.6	479.5	1,090.00	6.00	0.00	0	0		
									point42	42	1,234.6	478.4	1,090.00	6.00	0.00	0	0		
									point40	40	1,162.4	515.7	1,090.00	6.00					

INPUT: BARRIERS

B21102N1 Oakmont II Subdivision

Eilar Associates, Inc.	4 December 2012
AH	TNM 2.5

INPUT: BARRIERS

PROJECT/CONTRACT: B21102N1 Oakmont II Subdivision
 RUN: Future Traffic Noise-Lot 8 Mitigated

Barrier									Points										
Name	Type	Height		If Wall	If Berm			Add'tnl	Name	No.	Coordinates (bottom)			Height	Segment				
		Min	Max	\$ per	\$ per	Top	Run:Rise	\$ per			X	Y	Z	at	Seg	Ht	Perturbs	On	Important
				Unit	Unit	Width		Unit						Point	Incre-	#Up	#Dn	Struct?	Reflec-
		ft	ft	Area	Vol.		ft:ft	Length			ft	ft	ft	ft	ment				tions?
				\$/sq ft	\$/cu yd			\$/ft							ft				
Lot 8 Barrier	W	0.00	99.99	0.00				0.00	point43	43	1,561.0	671.0	1,065.00	6.00	0.00	0	0		
									point44	44	1,636.0	741.0	1,065.00	6.00					

RESULTS: SOUND LEVELS

B21102N1 Oakmont II Subdivision

Eilar Associates, Inc.									4 December 2012			
AH									TNM 2.5			
									Calculated with TNM 2.5			
RESULTS: SOUND LEVELS												
PROJECT/CONTRACT:		B21102N1 Oakmont II Subdivision										
RUN:		Future Traffic Noise-Lot 8 Mitigated										
BARRIER DESIGN:		INPUT HEIGHTS										
ATMOSPHERICS:		68 deg F, 50% RH										
Average pavement type shall be used unless a State highway agency substantiates the use of a different type with approval of FHWA.												

Receiver												
Name	No.	#DUs	Existing	No Barrier		Increase over existing		Type Impact	With Barrier			
			L _{Aeq1h}	L _{Aeq1h}	Crit'n	Calculated	Crit'n		Calculated	Noise Reduction	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
8-1	43	1	0.0	51.6	66	51.6	10	----	51.6	0.0	8	-8.0
8-2	44	1	0.0	53.0	66	53.0	10	----	53.0	0.0	8	-8.0
8-3	45	1	0.0	51.2	66	51.2	10	----	51.2	0.0	8	-8.0
8-4	46	1	0.0	49.5	66	49.5	10	----	49.5	0.0	8	-8.0
Dwelling Units		# DUs	Noise Reduction									
			Min	Avg	Max							
			dB	dB	dB							
All Selected		4	0.0	0.0	0.0							
All Impacted		0	0.0	0.0	0.0							
All that meet NR Goal		0	0.0	0.0	0.0							

Eilar Associates, Inc.	4 December 2012
AH	TNM 2.5

INPUT: BARRIERS

PROJECT/CONTRACT: B21102N1 Oakmont II Subdivision
 RUN: Future Traffic Noise-Lot 10 Mitigated

Barrier									Points										
Name	Type	Height		If Wall	If Berm			Add'tnl	Name	No.	Coordinates (bottom)			Height	Segment				
		Min	Max	\$ per	\$ per	Top	Run:Rise	\$ per			X	Y	Z	at	Seg	Ht	Perturbs	On	Important
				Unit	Unit	Width		Unit						Point	Incre-	#Up	#Dn	Struct?	Reflec-
		ft	ft	Area	Vol.			Length			ft	ft	ft	ft	ment				tions?
				\$/sq ft	\$/cu yd	ft	ft:ft	\$/ft											
Lot 10 Barrier	W	0.00	99.99	0.00				0.00	point45	45	1,903.0	582.0	1,050.00	6.00	0.00	0	0		
									point46	46	1,941.0	591.0	1,050.00	6.00	0.00	0	0		
									point47	47	1,950.0	608.0	1,050.00	6.00					

Eilar Associates, Inc.	4 December 2012
AH	TNM 2.5

INPUT: BARRIERS

PROJECT/CONTRACT: B21102N1 Oakmont II Subdivision
 RUN: Future Traffic Noise-Lot 11 Mitigated

Barrier									Points										
Name	Type	Height		If Wall	If Berm			Add'tnl	Name	No.	Coordinates (bottom)			Height	Segment				
		Min	Max	\$ per	\$ per	Top	Run:Rise	\$ per			X	Y	Z	at	Seg	Ht	Perturbs	On	Important
				Unit	Unit	Width		Unit						Point	Incre-	#Up	#Dn	Struct?	Reflec-
		ft	ft	Area	Vol.			Length			ft	ft	ft	ft	ment				tions?
				\$/sq ft	\$/cu yd	ft	ft:ft	\$/ft											
Lot 11 Barrier	W	0.00	99.99	0.00				0.00	point48	48	1,811.0	392.0	1,025.00	6.00	0.00	0	0		
									point49	49	1,837.0	400.0	1,025.00	6.00	0.00	0	0		
									point50	50	1,860.0	473.0	1,025.00	6.00					

APPENDIX C

Pertinent Sections of the County of San Diego Noise Element to the General Plan and Noise Ordinance



Noise Effects

Noise has a significant effect on quality of life. An individual's reaction to a particular noise depends on many factors such as the source of the noise, its loudness relative to the background noise level, and the time of day. The reaction to noise can also be highly subjective; the perceived effect of a particular noise can vary widely among individuals in a community. Because of the nature of the human ear, a sound must be about ten dB greater than the reference sound to be judged as twice as loud. In general, a three dB change in community noise levels is perceivable, while one to two dB changes generally are not perceived. Although the reaction to noise may vary, it is clear that noise is a significant component of the environment, and excessively noisy conditions can affect an individual's health and well-being. The effects of noise are often only transitory, but adverse effects can be cumulative with prolonged or repeated exposure. The effects of noise on a community can be organized into six broad categories: noise-induced hearing loss; interference with communication; effects on sleep; effects on performance and behavior; extra-auditory health effects; and annoyance.

Noise Standards

Noise exposure criteria are incorporated into land use planning to reduce future conflicts between noise and land use. This is achieved by specifying acceptable noise exposure ranges for various land uses throughout the County. The County uses the Noise Compatibility Guidelines listed in Table N-1 (Noise Compatibility Guidelines) to determine the compatibility of land use when evaluating proposed development projects.

The Noise Compatibility Guidelines indicate ranges of compatibility and are intended to be flexible enough to apply to a range of projects and environments. For example, a commercial project would be evaluated differently than a residential project in a rural area or a mixed-use project in a more densely developed area of the County.

A land use located in an area identified as "acceptable" indicates that standard construction methods would attenuate exterior noise to an acceptable indoor noise level and that people can carry out outdoor activities with minimal noise interference. Land uses that fall into the "conditionally acceptable" noise environment should have an acoustical study that considers the type of noise source, the sensitivity of the noise receptor, and the degree to which the noise source may interfere with sleep, speech, or other activities characteristic of the land use. For land uses indicated as "conditionally acceptable," structures must be able to attenuate the exterior noise to the indoor noise level as indicated in the Noise Standards listed in Table N-2 (Noise Standards). For land uses where the exterior noise levels fall within the "unacceptable" range, new construction generally should not be undertaken.

BACKGROUND INFORMATION

Land Use Category		Exterior Noise Level (CNEL)					
		55	60	65	70	75	80
A	Residential—single family residences, mobile homes, senior housing, convalescent homes						
B	Residential—multi-family residences, mixed-use (commercial/residential)						
C	Transient lodging—motels, hotels, resorts						
D*	Schools, churches, hospitals, nursing homes, child care facilities						
E*	Passive recreational parks, nature preserves, contemplative spaces, cemeteries						
F*	Active parks, golf courses, athletic fields, outdoor spectator sports, water recreation						
G*	Office/professional, government, medical/dental, commercial, retail, laboratories						
H*	Industrial, manufacturing, utilities, agriculture, mining, stables, ranching, warehouse, maintenance/repair						
	ACCEPTABLE—Specified land use is satisfactory, based upon the assumption that any buildings involved are of normal construction, without any special noise insulation requirements.						
	CONDITIONALLY ACCEPTABLE—New construction or development should be undertaken only after a detailed noise analysis is conducted to determine if noise reduction measures are necessary to achieve acceptable levels for land use. Criteria for determining exterior and interior noise levels are listed in Table N-2, Noise Standards. If a project cannot mitigate noise to a level deemed Acceptable, the appropriate county decision-maker must determine that mitigation has been provided to the greatest extent practicable or that extraordinary circumstances exist.						
	UNACCEPTABLE—New construction or development shall not be undertaken.						

* Denotes facilities used for part of the day; therefore, an hourly standard would be used rather than CNEL (refer to Table N-2).

Note: For projects located within an Airport Influence Area of an adopted Airport Land Use Compatibility Plan (ALUCP), additional Noise Compatibility Criteria restrictions may apply as specified in the ALUCP.



Table N-2 Noise Standards^{Note}	
1.	The exterior noise level (as defined in Item 3) standard for Category A shall be 60 CNEL, and the interior noise level standard for indoor habitable rooms shall be 45 CNEL.
2.	The exterior noise level standard for Categories B and C shall be 65 CNEL, and the interior noise level standard for indoor habitable rooms shall be 45 CNEL.
3.	The exterior noise level standard for Categories D and G shall be 65 CNEL and the interior noise level standard shall be 50 dBA L _{eq} (one hour average).
4.	For single-family detached dwelling units, "exterior noise level" is defined as the noise level measured at an outdoor living area which adjoins and is on the same lot as the dwelling, and which contains at least the following minimum net lot area: (i) for lots less than 4,000 square feet in area, the exterior area shall include 400 square feet, (ii) for lots between 4,000 square feet to 10 acres in area, the exterior area shall include 10 percent of the lot area; (iii) for lots over 10 acres in area, the exterior area shall include 1 acre.
5.	For all other residential land uses, "exterior noise level" is defined as noise measured at exterior areas which are provided for private or group usable open space purposes. "Private Usable Open Space" is defined as usable open space intended for use of occupants of one dwelling unit, normally including yards, decks, and balconies. When the noise limit for Private Usable Open Space cannot be met, then a Group Usable Open Space that meets the exterior noise level standard shall be provided. "Group Usable Open Space" is defined as usable open space intended for common use by occupants of a development, either privately owned and maintained or dedicated to a public agency, normally including swimming pools, recreation courts, patios, open landscaped areas, and greenbelts with pedestrian walkways and equestrian and bicycle trails, but not including off-street parking and loading areas or driveways.
6.	For non-residential noise sensitive land uses, exterior noise level is defined as noise measured at the exterior area provided for public use.
7.	For noise sensitive land uses where people normally do not sleep at night, the exterior and interior noise standard may be measured using either CNEL or the one-hour average noise level determined at the loudest hour during the period when the facility is normally occupied.
8.	The exterior noise standard does not apply for land uses where no exterior use area is proposed or necessary, such as a library.
9.	For Categories E and F the exterior noise level standard shall not exceed the limit defined as "Acceptable" in Table N-1 or an equivalent one-hour noise standard.

Note: Exterior Noise Level compatibility guidelines for Land Use Categories A-H are identified in Table N-1, Noise Compatibility Guidelines.

In addition, the County has adopted community noise control standards as part of the County's Noise Abatement and Control Ordinance (County Code of Regulatory Ordinances, Title 3, Division 6, Chapter 4) and provides guidance for implementation of the County's noise policies and ordinance in the County's *California Environmental Quality Act* (CEQA) Guidelines for Determining Significance for Noise. The Noise Ordinance defines limits for activities that generate excessive noise and sets noise level limits for land uses. The County's CEQA significance guidelines provide guidance on the use of the General Plan Noise Element and the County Noise Abatement and Control Ordinance when considering the environmental impact of noise exposure to high or excessive noise levels.

Cross reference(s)--Definitions, § [12.101](#) et seq.

SEC. 36.403. SOUND LEVEL MEASUREMENT.

(a) A sound level measurement made pursuant to this chapter shall be measured with a sound level meter using A-weighting and a "slow" response time, as these terms are used in ANSI S1.1-1994 or its latest revision.

(b) Each measurement shall be conducted at the boundary line of the property on which the noise source is located or any place on the affected property, but no closer than five feet from the noise source.

(c) The sound level meter shall be calibrated and adjusted by means of an acoustical calibrator of the coupler-type to assure meter accuracy within the tolerances in the ANSI specifications for sound level meters, ANSI S1.4-1983 or its latest revision. The sound level meter shall be used as provided in the manufacturer's instructions.

(Amended by Ord. No. 9962 (N.S.), effective 1-9-09)

SEC. 36.404. GENERAL SOUND LEVEL LIMITS.

(a) Except as provided in section [36.409](#) of this chapter, it shall be unlawful for any person to cause or allow the creation of any noise, which exceeds the one-hour average sound level limits in [Table 36.404](#), when the one-hour average sound level is measured at the property line of the property on which the noise is produced or at any location on a property that is receiving the noise.

**TABLE 36.404
SOUND LEVEL LIMITS IN DECIBELS (dBA)**

ZONE	TIME	ONE-HOUR AVERAGE SOUND LEVEL LIMITS (dBA)
(1) RS, RD, RR, RMH, A70, A72, S80, S81, S90, S92, RV, and RU with a General Plan Land Use Designation density of less than 10.9 dwelling units per acre.	7 a.m. to 10 p.m.	50
	10 p.m. to 7 a.m.	45
(2) RRO, RC, RM, S86, V5, RV and RU with a General Plan Land Use Designation density of 10.9 or more dwelling units per acre.	7 a.m. to 10 p.m.	55
	10 p.m. to 7 a.m.	50
(3) S94, V4, and all commercial zones.	7 a.m. to 10 p.m.	60
	10 p.m. to 7 a.m.	55
(4) V1, V2	7 a.m. to 7 p.m.	60
V1, V2	7 p.m. to 10 p.m.	55
V1	10 p.m. to 7 a.m.	55
V2	10 p.m. to 7 a.m.	50
V3	7 a.m. to 10 p.m.	70
	10 p.m. to 7 a.m.	65
(5) M50, M52, and M54	Anytime	70

(6)	S82, M56, and M58.	Anytime	75
(7)	S88 (see subsection (c) below)		

(b) Where a noise study has been conducted and the noise mitigation measures recommended by that study have been made conditions of approval of a Major Use Permit, which authorizes the noise-generating use or activity and the decision making body approving the Major Use Permit determined that those mitigation measures reduce potential noise impacts to a level below significance, implementation and compliance with those noise mitigation measures shall constitute compliance with subsection (a) above.

(c) S88 zones are Specific Planning Areas which allow different uses. The sound level limits in [Table 36.404](#) above that apply in an S88 zone depend on the use being made of the property. The limits in [Table 36.404](#), subsection (1) apply to property with a residential, agricultural or civic use. The limits in subsection (3) apply to property with a commercial use. The limits in subsection (5) apply to property with an industrial use that would only be allowed in an M50, M52 or M54 zone. The limits in subsection (6) apply to all property with an extractive use or a use that would only be allowed in an M56 or M58 zone.

(d) If the measured ambient noise level exceeds the applicable limit in [Table 36.404](#), the allowable one-hour average sound level shall be the one-hour average ambient noise level, plus three decibels. The ambient noise level shall be measured when the alleged noise violation source is not operating.

(e) The sound level limit at a location on a boundary between two zones is the arithmetic mean of the respective limits for the two zones. The one-hour average sound level limit applicable to extractive industries, however, including but not limited to borrow pits and mines, shall be 75 decibels at the property line regardless of the zone in which the extractive industry is located.

(f) A fixed-location public utility distribution or transmission facility located on or adjacent to a property line shall be subject to the sound level limits of this section measured at or beyond six feet from the boundary of the easement upon which the facility is located.

(Amended by Ord. No. 7094 (N.S.), effective 3-25-86; amended by Ord. No. 9478 (N.S.), effective 7-19-02; amended by Ord. No. 9621 (N.S.), effective 1-9-04; amended by Ord. No. 9962 (N.S.), effective 1-9-09; amended by Ord. No. 10211 (N.S.), effective 6-1-12)

📖 SEC. 36.405. REPAIRING, REBUILDING OR TESTING MOTOR VEHICLES.

It shall be unlawful for any person to repair, rebuild or test any motor vehicle in such a manner as to cause a disturbing, excessive or offensive noise as defined in section [36.402](#) of this chapter.

(Amended by Ord. No. 9962 (N.S.), effective 1-9-09)

📖 SEC. 36.406. POWERED MODEL VEHICLES.

It shall be unlawful for any person to operate a powered model vehicle between 9 p.m. and 7 a.m. A powered model vehicle operated in a County park shall meet the daytime sound level standards for an RS zone measured at a point 100 feet from the park property line or 100 feet from where the model vehicle is being operated, whichever is less.

(Amended by Ord. No. 9962 (N.S.), effective 1-9-09)

📖 SEC. 36.407. REFUSE VEHICLES & PARKING LOT SWEEPERS.

No person shall operate or allow to be operated, a refuse compacting, processing, or collection vehicle or a parking lot sweeper between the hours of 10 p.m. to 6 a.m., in or within 100 feet of a residential zone.

(Amended by Ord. No. 7428 (N.S.), effective 2-4-88; amended by Ord. No. 9962 (N.S.), effective 1-9-09)

SEC. 36.408. HOURS OF OPERATION OF CONSTRUCTION EQUIPMENT.

Except for emergency work, it shall be unlawful for any person to operate or cause to be operated, construction equipment:

(a) Between 7 p.m. and 7 a.m.

(b) On a Sunday or a holiday. For purposes of this section, a holiday means January 1st, the last Monday in May, July 4th, the first Monday in September, December 25th and any day appointed by the President as a special national holiday or the Governor of the State as a special State holiday. A person may, however, operate construction equipment on a Sunday or holiday between the hours of 10 a.m. and 5 p.m. at the person's residence or for the purpose of constructing a residence for himself or herself, provided that the operation of construction equipment is not carried out for financial consideration or other consideration of any kind and does not violate the limitations in sections [36.409](#) and [36.410](#).

(Amended by Ord. No. 9962 (N.S.), effective 1-9-09)

SEC. 36.409. SOUND LEVEL LIMITATIONS ON CONSTRUCTION EQUIPMENT.

Except for emergency work, it shall be unlawful for any person to operate construction equipment or cause construction equipment to be operated, that exceeds an average sound level of 75 decibels for an eight-hour period, between 7 a.m. and 7 p.m., when measured at the boundary line of the property where the noise source is located or on any occupied property where the noise is being received.

(Amended by Ord. No. 9700 (N.S.), effective 2-4-05; amended by Ord. No. 9962 (N.S.), effective 1-9-09)

SEC. 36.410. SOUND LEVEL LIMITATIONS ON IMPULSIVE NOISE.

In addition to the general limitations on sound levels in section [36.404](#) and the limitations on construction equipment in section [36.409](#), the following additional sound level limitations shall apply:

(a) Except for emergency work or work on a public road project, no person shall produce or cause to be produced an impulsive noise that exceeds the maximum sound level shown in [Table 36.410A](#), when measured at the boundary line of the property where the noise source is located or on any occupied property where the noise is received, for 25 percent of the minutes in the measurement period, as described in subsection (c) below. The maximum sound level depends on the use being made of the occupied property. The uses in [Table 36.410A](#) are as described in the County Zoning Ordinance.

**TABLE 36.410A.
MAXIMUM SOUND LEVEL (IMPULSIVE) MEASURED AT OCCUPIED PROPERTY IN DECIBELS (dBA)**

OCCUPIED PROPERTY USE	DECIBELS (dBA)
Residential, village zoning or civic use	82
Agricultural, commercial or industrial use	85

(b) Except for emergency work, no person working on a public road project shall produce or cause to be produced an impulsive noise that exceeds the maximum sound level shown in [Table 36.410B](#), when measured at the boundary line of the property where the noise source is located or on any occupied property where the noise is received, for 25 percent of the minutes in the measurement period, as described in subsection (c) below. The maximum sound level depends on the use being made of the occupied property. The uses in [Table 36.410B](#) are as described in the County Zoning Ordinance.