IV. ENVIRONMENTAL IMPACT ANALYSIS

I. NOISE

1. INTRODUCTION

The following analysis of noise impacts is based primarily upon the *Weddington Golf and Senior Housing Project Air Quality and Noise Impact Report*, prepared by Terry A. Hayes Associates, dated June 27, 2013, and incorporated fully herein. The noise report, including the applicable noise calculation sheets are provided in *Appendix B: Air Quality and Noise Assessments* of this Draft EIR.

2. ENVIRONMENTAL CONDITIONS

a. Physical Setting

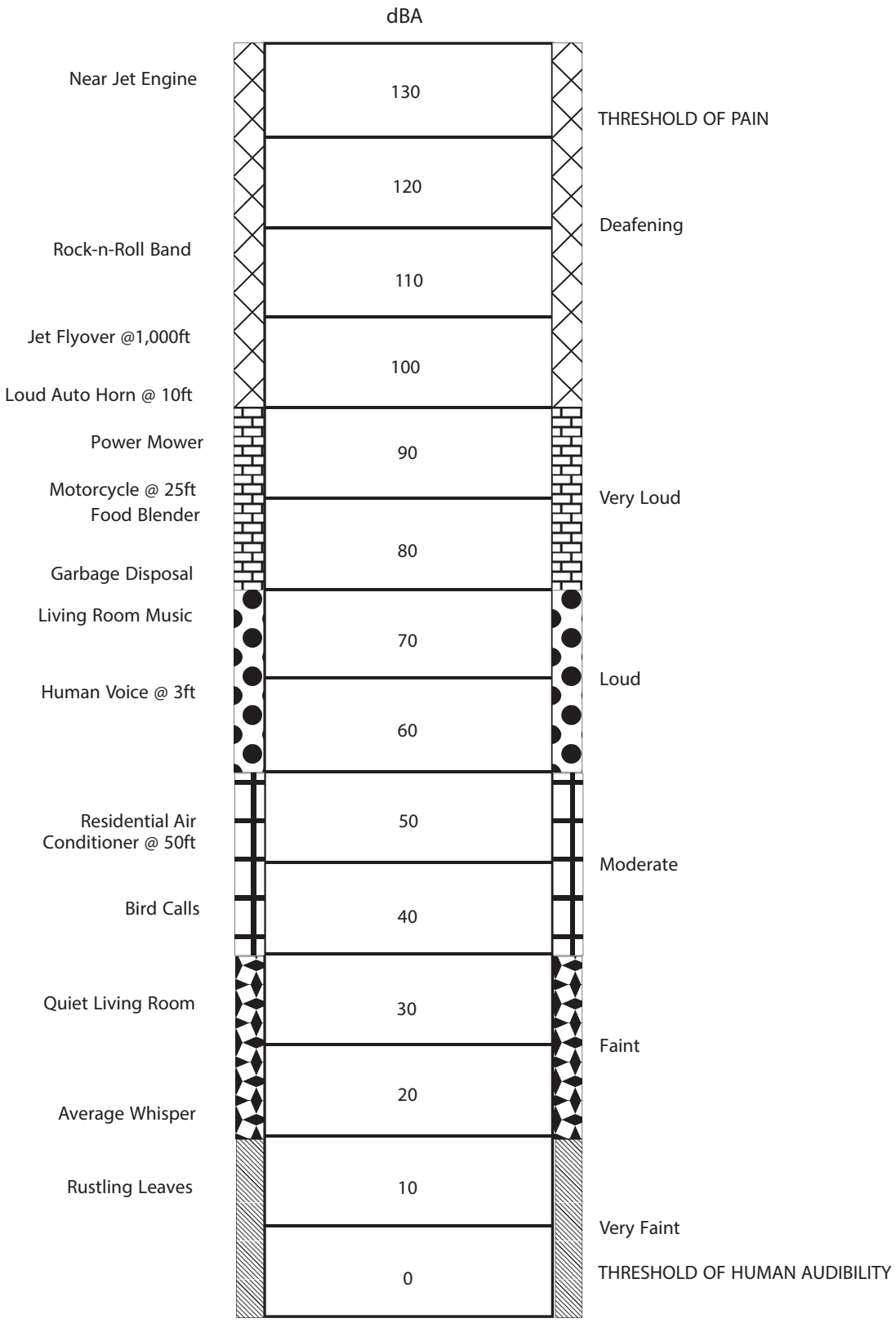
The following discussion focuses on providing noise and ground-borne vibration background information. In addition, existing noise and ground-borne conditions are characterized.

(1) Characteristics of Sound

Sound is technically described in terms of the loudness (amplitude) and frequency (pitch). The standard unit of measurement for sound is the decibel (dB). The human ear is not equally sensitive to sound at all frequencies. The "A-weighted scale," abbreviated dBA, reflects the normal hearing sensitivity range of the human ear. On this scale, the range of human hearing extends from approximately 3 to 140 dBA. *Figure IV.I-1: A-Weighted Decibel Scale* provides examples of A-weighted noise levels from common sounds. This noise analysis discusses sound levels in terms of Community Noise Equivalent Level (CNEL) and Equivalent Noise Level (L_{eq}).

Community Noise Equivalent Level. CNEL is an average sound level during a 24-hour period. CNEL is a noise measurement scale, which accounts for noise source, distance, single event duration, single event occurrence, frequency, and time of day. Human reaction to sound between 7:00 P.M. and 10:00 P.M. is as if the sound were actually 5 decibels higher than if it occurred from 7:00 A.M. to 7:00 P.M. From 10:00 P.M. to 7:00 A.M., humans perceive sound as if it were 10 dBA higher due to the lower background level. Hence, the CNEL is obtained by adding an additional 5 dBA to sound levels in the evening from 7:00 P.M. to 10:00 P.M. and 10 dBA to sound levels in the night between 10:00 P.M. and 7:00 A.M. Because CNEL accounts for human sensitivity to sound, the CNEL 24-hour figure is always a higher number than the actual 24-hour average.

Equivalent Noise Level. L_{eq} is the average noise level on an energy basis for any specific time period. The L_{eq} for one hour is the energy average noise level during the hour. The average noise level is based on the energy content (acoustic energy) of the sound. L_{eq} can be thought of as the level of a continuous noise which has the same energy content as the fluctuating noise level. The equivalent noise level is expressed in units of dBA.



SOURCE: Cowan, James P., Handbook of Environmental Acoustics

FIGURE IV.I-1
A-WEIGHTED DECIBEL SCALE

SOURCE: TERRYA.HAYES ASSOCIATES INC.

NORTH

(a) Effects of Noise

Noise is generally defined as unwanted sound. The degree to which noise can impact the human environment ranges from levels that interfere with speech and sleep (annoyance and nuisance) to levels that cause adverse health effects (hearing loss and psychological effects). Human response to noise is subjective and can vary greatly from person to person. Factors that influence individual response include the intensity, frequency, and pattern of noise, the amount of background noise present before the intruding noise, and the nature of work or human activity that is exposed to the noise source.

(b) Audible Noise Changes

Studies have shown that the smallest perceptible change in sound level for a person with normal hearing sensitivity is approximately 3 dBA. A change of at least 5 dBA would be noticeable and would likely evoke a community reaction. A 10-dBA increase is subjectively heard as a doubling in loudness and would cause a community response.

Noise levels decrease as the distance from the noise source to the receiver increases. Noise generated by a stationary noise source, or "point source," will decrease by approximately 6 dBA over hard surfaces (e.g., pavement) and 7.5 dBA over soft surfaces (e.g., grass) for each doubling of the distance. For example, if a noise source produces a noise level of 89 dBA at a reference distance of 50 feet, then the noise level would be 83 dBA at a distance of 100 feet from the noise source, 77 dBA at a distance of 200 feet, and so on. Noise generated by a mobile source will decrease by approximately 3 dBA over hard surfaces and 4.5 dBA over soft surfaces for each doubling of the distance.

Generally, noise is most audible when traveling by direct line-of-sight.[1] Barriers, such as walls, berms, or buildings, that break the line-of-sight between the source and the receiver greatly reduces noise levels from the source since sound can only reach the receiver by bending over the top of the barrier (diffraction). Sound barriers can reduce sound levels by up to 20 dBA. However, if a barrier is not high or long enough to break the line-of-sight from the source to the receiver, its effectiveness is greatly reduced. In situations where the source or the receiver is located three meters (approximately ten feet) above the ground, or whenever the line-of-sight averages more than three meters above the ground, sound levels would be reduced by approximately 3 dBA for each doubling of distance.

(2) Characteristics of Vibration

Vibration is an oscillatory motion through a solid medium in which the motion's amplitude can be described in terms of displacement, velocity, or acceleration. Vibration can be a serious concern, causing buildings to shake and rumbling sounds to be heard. In contrast to noise, vibration is not a common environmental problem. It is unusual for vibration from sources such as buses and trucks to be perceptible, even in locations close to major roads. Some common

[1] Line-of-sight is an unobstructed visual path between the noise source and the noise receptor.

sources of vibration are trains, buses on rough roads, and construction activities, such as blasting, pile driving, and heavy earth-moving equipment.

There are several different methods that are used to quantify vibration. The peak particle velocity (PPV) is defined as the maximum instantaneous peak of the vibration signal. The PPV is most frequently used to describe vibration impacts to buildings and is usually measured in inches per second. The root mean square (RMS) amplitude is most frequently used to describe the affect of vibration on the human body. The RMS amplitude is defined as the average of the squared amplitude of the signal. Decibel notation (Vdb) is commonly used to measure RMS. The decibel notation acts to compress the range of numbers required to describe vibration.[2]

(a) Effects of Vibration

High levels of vibration may cause physical personal injury or damage to buildings. However, vibration levels rarely affect human health. Instead, most people consider vibration to be an annoyance that may affect concentration or disturb sleep. In addition, high levels of vibration may damage fragile buildings or interfere with equipment that is highly sensitive to vibration (e.g., electron microscopes).

To counter the effects of vibration, the Federal Transit Administration (FTA) has published guidance relative to vibration impacts. According to the FTA, fragile buildings can be exposed to vibration levels of 0.3 inches per second PPV without experiencing structural damage.[3]

(b) Perceptible Vibration Change

In contrast to noise, vibration is not a phenomenon that most people experience every day. The background vibration velocity level in residential areas is usually 50 Vdb RMS or lower, well below the threshold of perception for humans which is around 65 Vdb RMS.[4] Most perceptible indoor vibration is caused by sources within buildings, such as operation of mechanical equipment, movement of people, or slamming of doors. Typical outdoor sources of perceptible vibration are construction equipment, steel-wheeled trains, and traffic on rough roads. If the roadway is smooth, the vibration from traffic is rarely perceptible.

(3) Existing Local Noise Conditions

The existing noise environment of the Project area is characterized by vehicular traffic and noises typical to a dense urban area (e.g., tennis facilities and sirens from the adjacent fire station). Sound measurements were taken using a SoundPro DL Sound Level Meter between 11:20 A.M. and 1:20 P.M. on January 12, 2012 to determine existing ambient daytime noise levels in the Project vicinity. These readings were used to establish existing ambient noise conditions and to provide a baseline for evaluating noise impacts. As shown in *Table IV.I-1:*

[2] Federal Transit Administration, *Transit Noise and Vibration Impact Assessment*, May 2006.
[3] Federal Railway Administration, *High-Speed Ground Transportation Noise and Vibration Impact Assessment*, October 2005.
[4] Federal Transit Administration, *Transit Noise and Vibration Impact Assessment*, May 2006.

Existing Noise Levels, the existing ambient sound levels range between 53.3 and 68.6 dBA L_{eq}. Noise monitoring locations are shown in *Figure IV.I-2: Noise Monitoring Locations*.

A 24-hour sound measurement was taken from 10:30 A.M., Wednesday, January 18, 2012 to 10:30 A.M.,Thursday, January 19, 2012. The recorded CNEL was 69.5 dBA.

TABLE IV.I-1
EXISTING NOISE LEVELS[1]

KEY TO *FIGURE IV.I-2: NOISE MONITORING LOCATIONS*	NOISE MONITORING LOCATION	SOUND LEVEL (dBA, L_{EQ})
1	Christian Science Church – 4032 Whitsett Avenue	68.6
2	Single-Family Residence – 4118 Wilkinson Avenue	53.3
3	Single-Family Residence – 4202 Beeman Avenue	57.5
4	Single- and Multi-Family Residence – 12464 Sunswept Drive	66.5
5	Single-Family Residence – 4155 Bellaire Avenue	55.1

[1] Source: Terry A. Hayes Associates LLC, *Weddington Golf and Senior Housing Project Air Quality and Noise Impact Report*, June 2013.

(4) Existing Local Vibration Conditions

Similar to the environmental setting for noise, the vibration environment is dominated by traffic from nearby roadways. Heavy trucks can generate vibrations that vary depending on vehicle type, weight, and pavement conditions. As heavy trucks typically operate on major streets, existing vibration in the Project vicinity is largely related to heavy truck traffic on the surrounding roadway network. Field observations indicate that truck travel is minimal on Whitsett Avenue. Vibration levels from adjacent roadways are not perceptible at the Project Site.

(5) Sensitive Receptors

Noise- and vibration-sensitive land uses are locations where people reside or where the presence of unwanted sound could adversely affect the use of the land. Residences, schools, hospitals, guest lodging, libraries, and some passive recreation areas would each be considered noise- and vibration-sensitive, and may warrant unique measures for protection from intruding noise. As the uses and activities on proposed Lot 1 (i.e., golf course, driving range, clubhouse, putting green, and surface parking area) would not change with development of the Project, the existing ambient noise and vibration from these uses would remain status quo for the sensitive receptors. As such, the impacts from construction and operational noise and vibration on sensitive receptors are measured from the Development Site, which is the southeast portion of the Project Site that will undergo change for the Project and may have new potential noise and vibration impacts on sensitive receptors. As shown in *Figure IV.I-3: Noise Sensitive Receptor Locations*, sensitive receptors near the Development Site include the following:

LEGEND:

Project Site Development Site # Sensitive Receptors

1. Christian Science Church
2. Single-Family Residence
3. Single-Family Residence
4. Single- and Multi-Family Residence
5. Single-Family Residence

SOURCE: ESRI and TAHA, 2012

FIGURE IV.I-2
NOISE MONITORING LOCATIONS

SOURCE: TERRYA.HAYES ASSOCIATES INC.

NORTH

LEGEND:

Project Site Development Site # Sensitive Receptors

1. Single- and Multi-Family Residences
2. Christian Science Church
3. Single- and Multi-Family Residences
4. Single-Family Residences
5. Single-Family Residences

SOURCE: ESRI and TAHA, 2012

FIGURE IV.I-3
NOISE SENSITIVE RECEPTOR LOCATIONS
SOURCE: TERRYA.HAYES ASSOCIATES INC.

NORTH

- Single- and multi-family residences located 120 feet to the east
- Christian Science Church located 180 feet to the southeast
- Single- and multi-family residences located 415 feet to the north
- Single-family residences located 595 feet to the south
- Single-family residences located 995 feet to the northwest

The above sensitive receptors represent the nearest residential land uses with the potential to be impacted by the proposed Project. Additional sensitive receptors are located further from the Development Site in the surrounding community and would be less impacted by noise and vibration than the above sensitive receptors.

b. Regulatory and Policy Setting

(1) Noise

Noise Element of the City of Los Angeles General Plan. The City of Los Angeles has developed a Noise Element of the General Plan to guide in the development of noise regulations.[5] It addresses noise mitigation regulations, strategies and programs and delineates federal, State, and City jurisdiction relative to rail, automotive, aircraft, and nuisance noise. Programs included in the Noise Element that are relevant to the proposed Project include:

- For a proposed development project that is deemed to have a potentially significant noise impact on noise sensitive uses, as defined by this chapter, require mitigation measures, as appropriate, in accordance with CEQA and City procedures.

- When issuing discretionary permits for a proposed noise-sensitive use (as defined by this chapter) or a subdivision of four or more detached single-family units and which use is determined to be potentially significantly impacted by existing or proposed noise sources, require mitigation measures, as appropriate, in accordance with procedures set forth in the CEQA so as to achieve an interior noise level of a CNEL of 45 dB, or less, in any habitable room, as required by Los Angeles Municipal Code Section 91.

- Use, as appropriate, the "Guidelines for Noise Compatible Land Use", or other measures that are acceptable to the city, to guide land use and zoning reclassification, subdivision, conditional use and use variance determinations and environmental assessment considerations, especially relative to sensitive uses, as defined by this chapter, within a CNEL of 65 dB airport noise exposure areas and within a line of sight of freeways, major highways, railroads or truck haul routes.

City of Los Angeles Municipal Code (LAMC). The City of Los Angeles has established policies and regulations concerning the generation and control of noise that could adversely affect its citizens and noise sensitive land uses. Regarding construction, Section 41.40 (Noise Due to Construction, Excavation Work – When Prohibited) of the Los Angeles Municipal Code

[5] City of Los Angeles, Noise Element of the Los Angeles City General Plan, February 3, 1999.

(LAMC) indicates that no construction or repair work shall be performed between the hours of 9:00 P.M. and 7:00 A.M., since such activities would generate loud noises and disturb persons occupying sleeping quarters in any adjacent dwelling, hotel, apartment or other place of residence. No person, other than an individual home owner engaged in the repair or construction of his/her single-family dwelling, shall perform any construction or repair work of any kind or perform such work within 500 feet of land so occupied before 8:00 A.M. or after 6:00 P.M. on any Saturday or on a federal holiday, nor at any time on any Sunday. Under certain conditions, the City may grant a waiver to allow limited construction activities to occur outside of the limits described above.

Section 112.05 (Maximum Noise Level of Powered Equipment or Powered Hand Tools) of the LAMC also specifies the maximum noise level of powered equipment or powered hand tools. Any powered equipment or hand tool that produces a maximum noise level exceeding 75 dBA at a distance of 50 feet is prohibited. However, this noise limitation does not apply where compliance is technically infeasible. Technically infeasible means the above noise limitation cannot be met despite the use of mufflers, shields, sound barriers and/or any other noise reduction device or techniques during the operation of equipment.

(2) Vibration

There are no adopted City standards for ground-borne vibration. The County of Los Angeles vibration standard is stated in Title 12 (Environmental Protection), Chapter 12.08 (Noise Control), Section 12.08.560 (Vibration) of the Los Angeles County Code. The County Code states that, "Operating or permitting the operation of any device that creates vibration which is above the vibration perception threshold of any individual at or beyond the property boundary of the source if on private property, or at 150 feet (46 meters) from the source if on a public space or public right-of-way is prohibited. The perception threshold shall be a motion velocity of 0.01 in/sec over the range of 1 to 100 Hertz."

3. ENVIRONMENTAL IMPACTS

a. Methodology

The noise and vibration analysis considers construction and operational sources. The noise level during the construction period at each receptor location was calculated by (1) making a distance adjustment to the construction source sound level and (2) logarithmically adding the adjusted construction noise source level to the ambient noise level. Reference noise levels for equipment were provided by the United States Environmental Protection Agency (USEPA). Mobile source noise levels were estimated using guidance provided by the Federal Highway Administration. Operational vibration is qualitatively discussed based on guidance in the FTA *Transit Noise and Vibration Impact Assessment*. Construction vibration levels are estimated using equipment reference levels and propagation formulas provide by the FTA.

b. Thresholds of Significance

Based on the City of Los Angeles Noise Ordinance (LAMC Chapter XI), the City of Los Angeles *LA CEQA Thresholds Guide* (2006) and the State Land Use Compatibility Matrix,[6] the proposed Project would result in significant noise and vibration impacts if it would generate noise and vibration levels in excess of the following thresholds.

(1) Construction Phase Significance Criteria

A significant construction noise impact would result if:

- Construction activity would occur outside of the hours permitted by the City's Noise Ordinance (i.e., between the hours of 9:00 P.M. and 7:00 A.M. on weekdays, before 8:00 A.M. or after 6:00 P.M. on Saturday or any federal holiday, or anytime on Sunday);

- Construction activity would occur within 500 feet of a residential zone on Saturday unless an after-hours construction permit has been issued by the City. An after-hours permit could be issued by the City for low noise level construction activities (e.g., painting and interior improvements); and/or

- Construction activity would exceed existing ambient exterior noise levels by 5 dBA or more at a noise sensitive use.

(2) Operations Significance Criteria

A significant operational noise impact would result if:

- The proposed Project causes the ambient noise level measured at the property line of the affected uses to increase by 3 dBA CNEL to or within the "normally unacceptable" or "clearly unacceptable" category or any 5 dBA or more increase in noise level. As shown in *Table IV.I-2: Land Use Compatibility for Community Noise Environments*, "normally unacceptable" ranges from 70 to 75 dBA CNEL for single- and multi-family residences, and 70 to 80 dBA CNEL for medical uses, which include hospitals and medical offices. "Clearly unacceptable" ranges from 70 to 85 dBA CNEL or greater for single- and multi-family residences, and 80 dBA CNEL or greater for medical uses; and/or

- The proposed Project would expose new sensitive receptors to interior noise levels greater than 45 dBA.

[6] California Office of Noise Control, Department of Health Services.

(3) Vibration Significance Criteria

There are no adopted State or City of Los Angeles vibration standards. Based on federal guidelines, the proposed Project would result in a significant construction or operational vibration impact if:

- The proposed Project would expose buildings to the FTA building damage threshold level of 0.3 inches per second.[7]

TABLE IV.I-2
LAND USE COMPATIBILITY FOR COMMUNITY NOISE ENVIRONMENTS[1]

LAND USE CATEGORY	COMMUNITY NOISE EXPOSURE (dBA, CNEL)						
	55	60	65	70	75	80	
Residential - Low Density Single-Family, Duplex, Mobile Homes							
Residential - Multi-Family							
Transient Lodging - Motels Hotels							
Schools, Libraries, Churches, Hospitals, Nursing Homes							
Auditoriums, Concert Halls, Amphitheaters							
Sports Arena, Outdoor Spectator Sports							
Playgrounds, Neighborhood Parks							
Golf Courses, Riding Stables, Water Recreation, Cemeteries							
Office Buildings, Business Commercial and Professional							
Industrial, Manufacturing, Utilities, Agriculture							

KEY:

Normally Acceptable

Specified land use is satisfactory, based upon the assumption that any buildings involved are of normal conventional construction without any special noise insulation requirements.

[7] Federal Transit Administration, *Transit Noise and Vibration Impact Assessment*, May 2006.

TABLE IV.I-2 (CONTINUED)
LAND USE COMPATIBILITY FOR COMMUNITY NOISE ENVIRONMENTS[1]

Conditionally Acceptable

New construction or development should be undertaken only after a detailed analysis of the noise reduction requirements is made and needed noise insulation features included in the design. Conventional construction, but with closed windows and fresh air supply system or air conditionally will normally suffice.

Normally Unacceptable

New construction or development should generally be discouraged. If new construction or development does proceed, a detailed analysis of the noise reduction requirements must be made and needed noise insulation features included in the design.

Clearly Unacceptable

New construction or development should generally not be undertaken.

[1] Source: California Office of Noise Control, Department of Health Services

c. Project Impacts

(1) Construction Phase Activity (Short-Term)

(a) General Construction Noise

Construction of the Project would result in temporary increases in ambient noise levels in the Project area on an intermittent basis. The increase in noise would likely result in a temporary annoyance to nearby residents during the approximate 24-month construction schedule. Noise levels would fluctuate depending on the construction phase, equipment type and duration of use, distance between the noise source and receptor, and presence or absence of noise attenuation barriers.

Construction activities typically require the use of numerous pieces of noise-generating equipment. Typical noise levels from various types of equipment that may be used during construction are listed in *Table IV.I-3: Maximum Noise Levels of Common Construction Machines*. The table shows noise levels at distances of 50 and 100 feet from the construction noise source.

TABLE IV.I-3
MAXIMUM NOISE LEVELS OF COMMON CONSTRUCTION MACHINES[1]

NOISE SOURCE	NOISE LEVEL (dBA)[2]	
	50 FEET	100 FEET
Jackhammer	90	84
Crane	88	82
Street Paver	87	81
Backhoe	84	78
Street Compressor	81	75
Front-end Loader	80	74
Grader	87	81

TABLE IV.I-3 (CONTINUED)
MAXIMUM NOISE LEVELS OF COMMON CONSTRUCTION MACHINES[1]

NOISE SOURCE	NOISE LEVEL (dBA)[2]	
	50 FEET	100 FEET
Idling Haul Truck	89	83
Cement Mixer	82	76
Impact Pile Driving	101	95
Auger Drilling	77	71

[1] Source: USEPA, *Noise from Construction Equipment and Operations, Building Equipment and Home Appliances*, PB 206717, 1971.
[2] Assumes a 6-dBA drop-off rate for noise generated by a "point source" and traveling over hard surfaces. Actual measured noise levels of the equipment listed in this table were taken at distances of ten and 30 feet from the noise source.

The noise levels shown in *Table IV.I-4: Typical Outdoor Construction Noise Levels* take into account the likelihood that more than one piece of construction equipment would be in operation at the same time and lists the typical overall noise levels that would be expected for each phase of construction. The highest noise levels are expected to occur during the grading/excavation and finishing phases of construction. A typical piece of noisy equipment is assumed to be active for 40 percent of the eight-hour workday (consistent with the USEPA studies of construction noise), generating a noise level of 89 dBA L_{eq} at a reference distance of 50 feet.

TABLE IV.I-4
TYPICAL OUTDOOR CONSTRUCTION NOISE LEVELS[1]

CONSTRUCTION PHASE	NOISE LEVEL AT 50 FEET (dBA)
Ground Clearing	84
Grading/Excavation	89
Foundations	78
Erection	85
Finishing	89

[1] Source: USEPA, *Noise from Construction Equipment and Operations, Building Equipment and Home Appliances*, PB 206717, 1971.

The noise level during the construction period at each receptor location was calculated by (1) making a distance adjustment to the construction source sound level and (2) logarithmically adding the adjusted construction noise source level to the ambient noise level. The estimated construction noise levels at sensitive receptors are shown in *Table IV.I-5: General Construction Noise Levels – Unmitigated.* Noise levels related to construction activity would exceed the 5 dBA significance threshold at three of the five nearby sensitive receptors. The Project would result in a significant construction noise impact without incorporation of Mitigation Measures.

TABLE IV.I-5
GENERAL CONSTRUCTION NOISE LEVELS – UNMITIGATED[1]

KEY TO *FIGURE IV.I-2:*	SENSITIVE RECEPTOR	DISTANCE (FEET)[2]	MAXIMUM CONSTRUCTION NOISE LEVEL (dBA)[3]	MONITORED EXISTING AMBIENT (dBA, L_{EQ})[4]	ADD NEW AMBIENT (dBA, L_{EQ})[5]	INCREASE[6]
1	Christian Science Church 4032 Whitsett Avenue	180	77.9	68.6	78.4	9.8
2	Single-Family Residence 4118 Wilkinson Avenue	415	58.6	57.5	59.7	6.4
3	Single Family Residence 4202 Beeman Avenue	595	69.5	65.5	69.8	12.3
4	Single- and Multi-Family Residence 12464 Sunswept Drive	753	66.4	66.5	69.5	3.0
5	Single-Family Residence 4155 Bellaire Avenue	995	51.0	55.1	56.5	1.4

[1] Source: Terry A. Hayes Associates, *Weddington Golf and Senior Housing Project Air Quality and Noise Impact Report*, June 2013.
[2] Distance of noise source from receptor.
[3] Construction noise source's sound level at receptor location, with distance and building adjustment.
[4] Pre-construction activity ambient sound level at receptor location.
[5] New sound level at receptor location during the construction period, including noise from construction activity.
[6] An incremental noise level increase of 5 dBA or more would result in a significant impact.

(b) Pile Driving Noise

Pile driving activity would potentially occur during the construction process. Impact pile driving typically generates noise levels of 101 dBA L_{eq} at 50 feet. As shown in *Table IV.I-6: Pile Driving Noise Levels -- Unmitigated*, the Project would increase the ambient noise levels during pile driving activity between 2.5 and 21.3 dBA L_{eq} at sensitive receptors in the Project vicinity. Although temporary and intermittent, pile driving noise levels would exceed the 5 dBA significance threshold at four of the five nearby sensitive receptors. Therefore, the Project would result in a significant construction noise impact without incorporation of Mitigation Measures.

Table IV.I-6
PILE DRIVING NOISE LEVELS – UNMITIGATED [1]

KEY TO *FIGURE IV.I-2:*	SENSITIVE RECEPTOR	DISTANCE (FEET)[2]	MAXIMUM CONSTRUCTION NOISE LEVEL (dBA)[3]	MONITORED EXISTING AMBIENT (dBA, L_{EQ})[4]	ADD NEW AMBIENT (dBA, L_{EQ})[5]	INCREASE[6]
1	Christian Science Church 4032 Whitsett Avenue	180	89.9	68.6	89.9	21.3
2	Single-Family Residence 4118 Wilkinson Avenue	415	70.6	57.5	70.8	13.3
3	Single Family Residence 4202 Beeman Avenue	595	81.5	65.5	81.6	16.1
4	Single- and Multi-Family Residence 12464 Sunswept Drive	753	65.4	66.5	69.0	2.5
5	Single-Family Residence 4155 Bellaire Avenue	995	74.3	55.1	74.3	19.2

[1] Source: Terry A. Hayes Associates, *Weddington Golf and Senior Housing Project Air Quality and Noise Impact Report*, June 2013.
[2] Distance of noise source from receptor.
[3] Construction noise source's sound level at receptor location, with distance and building adjustment.
[4] Pre-construction activity ambient sound level at receptor location.
[5] New sound level at receptor location during the construction period, including noise from construction activity.
[6] An incremental noise level increase of 5 dBA or more would result in a significant impact.

(2) Operations Activity (Long-Term)

(a) Vehicular Noise

The predominant noise source for the proposed Project is vehicular traffic. According to the traffic impact study prepared by Linscott, Law, and Greenspan, Engineers, the Project would generate 624 net daily vehicle trips.[8] *Table IV.I-7: Operational Mobile Source Noise Levels – Future Cumulative Pre-Project and With Project Conditions* shows peak hour mobile source noise levels along the analyzed roadway segments for Future Cumulative Pre-Project Conditions and Future Cumulative with Project Conditions (Project build-out anticipated to be 2016). The greatest Project-related noise increase would be 0.1 dBA L_{eq} along both Whitsett Avenue between Moorpark Street and Ventura Boulevard and Moorpark Street between Whitsett and Coldwater Canyon Avenues. This would not exceed the most conservative roadway noise threshold of 3-dBA. Therefore, the operation of the Project after 2016 build-out would result in a less-than-significant impact related to mobile noise levels.

[8] Linscott, Law & Greenspan, Engineers, *Studio City Senior Living Center Project Traffic Impact Study*, February 2, 2012.

TABLE IV.I-7
OPERATIONAL MOBILE SOURCE NOISE LEVELS –
FUTURE CUMULATIVE PRE-PROJECT AND WITH PROJECT CONDITIONS[1]

ROADWAY	ESTIMATED dBA, Leq		
	NO PROJECT (2016)	PROJECT (2016)	PROJECT IMPACT
Whitsett Ave between Riverside Dr and Moorpark St	70.4	70.4	0
Whitsett Ave between Moorpark St and Ventura Blvd	69.8	69.9	0.1
Moorpark St between Coldwater Canyon and Whitsett Ave	70.7	70.7	0
Moorpark St between Whitsett Ave and Laurel Canyon Blvd	70.4	70.5	0.1

[1] Source: Terry A. Hayes Associates, *Weddington Golf and Senior Housing Project Air Quality and Noise Impact Report*, June 2013.

Table IV.I-8: Operational Mobile Source Noise Levels – Existing Conditions and Existing With Project Conditions shows peak hour mobile source noise levels along the analyzed roadway segments for Existing Conditions (without the Project) and Existing with Project Conditions in the current year. The greatest Project-related noise increase would be 0.1 dBA L_{eq} along Whitsett Avenue.This would not exceed the most conservative roadway noise threshold of 3-dBA. Therefore, the operation of the Project under the scenario of being developed in existing noise conditions would result in a less-than-significant related to mobile noise levels.

TABLE IV.I-8
OPERATIONAL MOBILE SOURCE NOISE LEVELS –
EXISTING CONDITIONS AND EXISTING WITH PROJECT CONDITIONS[1]

ROADWAY	ESTIMATED dBA, Leq		
	NO PROJECT	PROJECT	PROJECT IMPACT
Whitsett Ave between Riverside Dr and Moorpark St	69.9	70	0.1
Whitsett Ave between Moorpark St and Ventura Blvd	69.3	69.4	0.1
Moorpark St between Coldwater Canyon and Whitsett Ave	70.2	70.2	0
Moorpark St between Whitsett Ave and Laurel Canyon Blvd	70	70	0

[1] Source: Terry A. Hayes Associates, *Weddington Golf and Senior Housing Project Air Quality and Noise Impact Report*, June 2013.

(b) Stationary Noise

Potential stationary noise sources related to the long-term operations of the Project include mechanical equipment and parking areas. Mechanical equipment (e.g., parking structure air vents and HVAC equipment) would be designed, per Compliance Measures, so as to be located within an enclosure or confined to the rooftop of the proposed structure. HVAC equipment typically generates a noise level of approximately 60 dBA L_{eq} at 50 feet. Mechanical equipment would be

screened from view as necessary to comply with provisions of the LAMC for onsite stationary sources. Operation of mechanical equipment would not be anticipated to increase ambient noise levels by 5 dBA or more. Therefore, the Project would result in a less-than-significant impact related to stationary equipment noise levels.

The Project would also include common outdoor amenities such as a lap pool and a small children's playground. However, the pool and playground would generally be surrounded by the proposed buildings and would not be in the direct line-of-site of any nearby sensitive receptors. As such, it is anticipated that noise generated at these land uses would not be audible at adjacent noise-sensitive land uses. Therefore, the proposed Project would result in a less-than-significant impact related to outdoor amenity noise levels.

(c) Parking Noise

The proposed Project would include 613 subterranean parking spaces underneath the senior housing community. Subterranean parking would be enclosed on all sides and noise generated by this facility would be inaudible at sensitive receivers. As such, parking structure activity would not be anticipated to incrementally increase ambient noise levels at sensitive receptors by 5 dBA or more. Therefore, the Project would result in a less-than-significant impact related to parking noise.

(d) Land Use/Noise Compatibility

It is important that new residential land uses are located in noise compatible environments. Two residential buildings would be located at the Project Site's property line along Whitsett Avenue. The existing CNEL along Whitsett Avenue is 69.5 dBA. As shown previously in *Table IV.I-3: Maximum Noise Levels of Common Construction Machines*, this noise level is conditionally acceptable for multi-family residences. Conditionally acceptable means that new construction or development should be undertaken only after a detailed analysis of the noise reduction requirements is made and needed noise insulation features included in the design. Conventional construction, but with closed windows and fresh air supply system or air conditioning will normally suffice. The Project would be constructed to current design standards and regulations, and each unit would include an air conditioning system. Therefore, the Project would result in a less-than-significant impact related to land use and noise compatibility.

The Project Site is adjacent to City of Los Angeles Fire Station No. 78. Noise generated by fire station activity was accounted for in the 24-hour measurement and the analysis presented above. Occasional siren activity may generate audible noise during daytime and nighttime hours. However, operational policy for the City's fire department is to limit the use of sirens and horns, as practical, when traveling past noise sensitive areas[9]. Due to the temporary and necessary nature of fire engine sirens, noise generated by this source is not considered a significant impact.

[9] Department of City Planning Los Angeles, *Noise Element of the Los Angeles City General Plan*, February 3, 1999.

(3) Vibration

(a) General Construction

Heavy-duty equipment activity on the Development Site would generate vibration. As shown in *Table IV.I-9: Vibration Velocities for Construction Equipment*, typical heavy-duty equipment (e.g., a large bulldozer) generates vibration levels of 0.089 inches per second PPV at a distance of 25 feet. The closest sensitive receptor that can be potentially impacted from heavy equipment activity is a multi-family residence along Whitsett Avenue, located approximately 120 feet away from the Development Site. This sensitive receptor could experience a vibration level of 0.008 inches per second PPV. Vibration levels would not exceed the potential building damage threshold of 0.3 inches per second PPV. Therefore, the Project would result in a less-than-significant impact related to general construction vibration.

TABLE IV.I-9
VIBRATION VELOCITIES FOR CONSTRUCTION EQUIPMENT[1]

EQUIPMENT	PPV AT 25 FEET (INCHES/SECOND)[2]
Pile Driving (Impact)	0.644
Pile Driving (Sonic)	0.170
Large Bulldozer	0.089
Caisson Drilling	0.089
Loaded Trucks	0.076

[1] Source: Federal Transit Authority, *Transit Noise and Vibration Impact Assessment*, May 2006.
[2] Fragile buildings can be exposed to vibration levels of 0.5 inches per second PPV without experiencing structural damage.

(b) Pile Driving

Construction of the Project would require drilled or driven piles. Based on the noise analysis presented above, the construction contractor would be required to use a drilling technique to place piles, as opposed to a driving, or impact, technique. Caisson drilling would generate a vibration level of 0.008 inches per second at the nearest sensitive receptor. Vibration levels would not exceed the potential building damage threshold of 0.3 inches per second PPV. Therefore, the Project would result in a less-than-significant impact related to drilling construction vibration.

(c) Operations

The proposed Project would not include significant stationary sources of vibration, such as heavy equipment operations. Operational vibration in the Project vicinity would be generated by vehicular travel on the local roadways. However, similar to existing conditions, traffic-related vibration levels would not be perceptible by sensitive receptors. Thus, operational vibration would result in a less-than-significant impact.

d. Cumulative Impacts

Development of the Project in combination with Related Projects would result in an increase in construction-related and traffic-related noise in the area. However, each of the Related Projects would be subject to LAMC Section 41.40, which limits the hours of allowable construction activities. In addition, each of the Related Projects would be subject to Section 112.05 of the LAMC, which prohibits any powered equipment or powered hand tool from producing noise levels that exceed 75 dBA at a distance of 50 feet from the noise source within 500 feet of a residential zone. Noise levels are only allowed to exceed this noise limitation under conditions where compliance is technically infeasible. Thus, the Project would not have a cumulatively considerable effect regarding violation of noise ordinances. With conformance with LAMC noise ordinances, the cumulative construction noise impact related to the violations of the City's noise standards would be less-than-significant.

Nevertheless, future construction associated with the Related Projects could result in a cumulatively significant impact with respect to temporary or periodic increases in ambient noise levels. Most of the Related Projects are approximately one mile from the Development Site and the nearest Related Project is Related Project No. 1. Similar to the Project, these Related Projects would require likely require the use of heavy construction equipment that would generate increased noise levels. As discussed above, the Project would result in significant construction noise impacts on sensitive receptors located in the Project area. Due to the possibility that construction of these identified Related Projects could potentially occur at times that overlap with Project construction. Project related construction noise levels could combine with Related Project construction noise levels to create a cumulatively considerable temporary noise impact upon noise sensitive receptors. As such, cumulative construction noise impacts would be considered significant.

With regards to cumulative operational noise impacts, as previously discussed, when determining mobile source noise levels from the Project, the noise analysis directly used future traffic impacts taken from the Project's Traffic Impact Study (see *Appendix I: Traffic Impact Study* of this EIR). The same was done to calculate cumulative mobile source noise levels from the Project in conjunction with other projects (or potential projects) and general ambient growth in the area. When calculating future traffic impacts, the traffic consultant took into consideration all Related Projects (on city record) and general ambient growth in the community through Project build-out in 2016. Thus, the future traffic results with and without the Project already account for this cumulative impact analysis. Consequently, since the noise impacts are generated directly from the traffic analysis results, the future noise impacts with and without the Project, as described in this analysis, already reflect cumulative impacts.

Table IV.I-10: Cumulative Mobile Source Noise Levels presents the cumulative increase in future traffic noise levels at various intersections (i.e., Existing Conditions and Future Cumulative with Project Conditions). The maximum cumulative roadway noise increase would be 0.6 dBA L_{eq} and would occur along Whitsett Avenue between Moorpark Street and Ventura Boulevard. Cumulative roadway noise levels would not exceed the 3 dBA threshold increment and would

not result in a perceptible change in noise level. Therefore, the proposed Project would result in a less-than-significant cumulatively considerable impact related to roadway noise and Project operations.

TABLE IV.I-10
CUMULATIVE MOBILE SOURCE NOISE LEVELS[1]

ROADWAY	ESTIMATED dBA, Leq		
	EXISTING	PROJECT	CUMULATIVE IMPACT
Whitsett Ave between Riverside Dr and Moorpark St	69.9	70.4	0.5
Whitsett Ave between Moorpark St and Ventura Blvd	69.3	69.9	0.6
Moorpark St between Coldwater Canyon and Whitsett Ave	70.2	70.7	0.5
Moorpark St between Whitsett Ave and Laurel Canyon Blvd	70	70.5	0.5

[1] Source: Terry A. Hayes Associates, *Weddington Golf and Senior Housing Project Air Quality and Noise Impact Report*, June 2013.

With regards to cumulative construction and operational vibration impacts, as discussed earlier, the Project would not exceed the potential building damage thresholds for construction and pile driving vibration, and would result in less-than-significant construction vibration impacts. As such, the Project will not cumulatively contribute to the vibration impacts of the Related Projects. Further, the predominant operational vibration source near the Project Site is heavy truck travel on the local roadways. Neither the Project nor any Related Projects would substantially increase heavy-duty vehicle traffic near the Project Site and would not cause a substantial increase in heavy-duty trucks on local roadways. Therefore, the Project would result in less-than-significant cumulatively considerable impacts related to both construction and operational vibration.

4. COMPLIANCE MEASURES, PDFS, AND MITIGATION PROGRAM

a. Compliance Measures

The following Compliance Measures are reasonably anticipated standard conditions that are based on local, State, and federal regulations or laws that serve to offset or prevent specific noise impacts. These Compliance Measures are applicable to the proposed Project and shall be incorporated to ensure that the Project has minimal impacts to surrounding uses:

- The Project shall comply with the City's Noise Ordinance (Ord. No. 156,363) to ensure that construction activities are conducted in accordance with the Los Angeles Municipal Code (LAMC).

- In compliance with the LAMC, construction activity shall be limited to between 7:00 A.M. and 9:00 P.M. on weekdays and 8:00 A.M. and 6:00 P.M. on Saturdays. Construction activity shall be prohibited on Sundays and federal holidays.

b. Project Design Features (PDFs)

There are no PDFs included with respect to noise and vibration impacts.

c. Mitigation Measures

The Project will result in less-than-significant construction vibration impacts and operational noise and vibration impacts. To ensure that the noise impacts resulting from the construction phase of Project are reduced to the extent possible, the following Mitigation Measures shall be implemented:

MM NOI-1: All construction equipment shall be equipped with mufflers and other suitable noise attenuation devices.

MM NOI-2: Grading and construction contractors shall use quieter equipment as opposed to noisier equipment (such as rubber-tired equipment rather than track equipment).

MM NOI-3: All residential units located within 500 feet of the construction site shall be sent a notice regarding the construction schedule of the proposed project. A sign, legible at a distance of 50 feet shall also be posted at the construction site. All notices and the signs shall indicate the dates and duration of construction activities, as well as provide a telephone number where residents can inquire about the construction process and register complaints.

MM NOI-4: A "noise disturbance coordinator" shall be established. The disturbance coordinator shall be responsible for responding to any local complaints about construction noise. The disturbance coordinator shall determine the cause of the noise complaint (e.g., starting too early, bad muffler, etc.) and shall be required to implement reasonable measures such that the complaint is resolved. All notices that are sent to residential units within 500 feet of the construction site and all signs posted at the construction site shall list the telephone number for the disturbance coordinator.

MM NOI-5: The construction contractor shall utilize caisson drilling instead of pile driving on the Development Site.

5. SIGNIFICANT PROJECT IMPACTS AFTER MITIGATION

(1) Construction Phase Activity (Short-Term)

(a) General Construction Noise

Mitigation Measure MM NOI-1 would reduce construction noise levels by 3 dBA. Implementation of the required Compliance Measures and Mitigation Measures MM NOI-2 through MM NOI-4 would assist in attenuating construction noise levels. *Table IV.I-11: General*

Construction Noise Levels – Mitigated shows mitigated general construction noise levels. Construction noise levels would still exceed the significance threshold at various sensitive receptors. Therefore, general construction noise would result in a significant and unavoidable impact after incorporation of Mitigation Measures. However, this significant and unavoidable impact would be temporary during the construction phase of the Project.

Pursuant to CEQA Guidelines Sections 15092 and 15093, and in the event the Project is approved, the City of Los Angeles must adopt a Statement of Overriding Considerations acknowledging these outstanding significant adverse impacts and stating the reason(s) for accepting these impacts in light of the whole environmental record as weighed against the benefits of the Project.

TABLE IV.I-11
GENERAL CONSTRUCTION NOISE LEVELS – MITIGATED[1]

KEY TO *FIGURE IV.I-2:*	SENSITIVE RECEPTOR	DISTANCE (FEET)[2]	MAXIMUM CONSTRUCTION NOISE LEVEL (dBA)[3]	MONITORED EXISTING AMBIENT (dBA, L_{EQ})[4]	ADD NEW AMBIENT (dBA, L_{EQ})[5]	INCREASE[6]
1	Christian Science Church 4032 Whitsett Avenue	180	74.9	68.6	75.8	7.2
2	Single-Family Residence 4118 Wilkinson Avenue	415	55.6	57.5	59.7	2.2
3	Single Family Residence 4202 Beeman Avenue	595	66.5	65.5	69.0	3.5
4	Single- and Multi-Family Residence 12464 Sunswept Drive	753	54.9	66.5	66.8	0.3
5	Single-Family Residence 4155 Bellaire Avenue	995	54.8	55.1	58.0	2.9

[1] Source: Terry A. Hayes Associates, *Weddington Golf and Senior Housing Project Air Quality and Noise Impact Report*, June 2013.
[2] Distance of noise source from receptor.
[3] Construction noise source's sound level at receptor location, with distance and building adjustment.
[4] Pre-construction activity ambient sound level at receptor location.
[5] New sound level at receptor location during the construction period, including noise from construction activity.
[6] An incremental noise level increase of 5 dBA or more would result in a significant impact.

(b) Pile Driving Noise

Mitigation Measure MM NOI-5 would require caisson drilling instead of impact pile driving. Drilling would typically generate a noise level of 71 dBA L_{eq} at 50 feet. *Table IV.I-12: Pile Driving Noise Levels – Mitigated* shows drilling noise levels after mitigation. Construction noise levels would still exceed the significance threshold at various sensitive receptors. Therefore, drilling noise would result in a significant and unavoidable impact after incorporation of mitigation measures. However, this significant and unavoidable cumulative impact would be temporary during the construction phase of the Project.

Pursuant to CEQA Guidelines Sections 15092 and 15093, and in the event the Project is

approved, the City of Los Angeles must adopt a Statement of Overriding Considerations acknowledging these outstanding significant adverse impacts and stating the reason(s) for accepting these impacts in light of the whole environmental record as weighed against the benefits of the Project.

TABLE IV.I-12
PILE DRIVING NOISE LEVELS – MITIGATED[1]

KEY TO *FIGURE IV.I-2:*	SENSITIVE RECEPTOR	DISTANCE (FEET)[2]	MAXIMUM CONSTRUCTION NOISE LEVEL (dBA)[3]	MONITORED EXISTING AMBIENT (dBA, L_{EQ})[4]	ADD NEW AMBIENT (dBA, L_{EQ})[5]	INCREASE[6]
1	Christian Science Church 4032 Whitsett Avenue	180	65.9	68.6	70.5	1.9
2	Single-Family Residence 4118 Wilkinson Avenue	415	46.6	68.6	68.6	0.0
3	Single Family Residence 4202 Beeman Avenue	595	57.5	57.5	60.5	3.0
4	Single- and Multi-Family Residence 12464 Sunswept Drive	753	41.4	66.5	66.5	0.0
5	Single-Family Residence 4155 Bellaire Avenue	995	50.3	55.1	56.3	1.2

[1] Source: Terry A. Hayes Associates, *Weddington Golf and Senior Housing Project Air Quality and Noise Impact Report*, June 2013.
[2] Distance of noise source from receptor.
[3] Construction noise source's sound level at receptor location, with distance and building adjustment.
[4] Pre-construction activity ambient sound level at receptor location.
[5] New sound level at receptor location during the construction period, including noise from construction activity.
[6] An incremental noise level increase of 5 dBA or more would result in a significant impact.

(2) Operations Activity (Long-Term)

The Project-related operational noise would result in a less-than-significant impact without the need for mitigations.

(3) Vibration

The Project-related construction and operational vibration impacts would result in less-than-significant impacts without the need for mitigations.