Environmental Noise Assessment

Vine Hill Residential

City of Martinez California

Job # 2012-141

Prepared For:

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December 23, 2013

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This section provides a general description of the existing noise sources in the project vicinity, a discussion of the regulatory setting, and identifies potential noise impacts associated with the proposed project. Project impacts are evaluated relative to applicable noise level criteria and to the existing ambient noise environment. Mitigation measures have been identified for significant noise-related impacts.

The proposed Vine Hill Residential project is a 100 unit single family home development on 26 acres at the intersection of Center avenue and Vine Hill Way in the City of Martinez, California. Figure 1 shows the project area. Figure 2 shows the proposed project site plan.

ENVIRONMENTAL SETTING

KEY TERMS

Acoustics	The science of sound.
Ambient Noise	The distinctive acoustical characteristics of a given area consisting of all noise sources audible at that location. In many cases, the term ambient is used to describe an existing or pre-project condition such as the setting in an environmental noise study.
Attenuation	The reduction of noise.
A-Weighting	A frequency-response adjustment of a sound level meter that conditions the output signal to approximate human response.
Decibel or dB	Fundamental unit of sound, defined as ten times the logarithm of the ratio of the sound pressure squared over the reference pressure squared.
CNEL	Community noise equivalent level. Defined as the 24-hour average noise level with noise occurring during evening hours (7 - 10 p.m.) weighted by a factor of three and nighttime hours weighted by a factor of 10 prior to averaging.
Frequency	The measure of the rapidity of alterations of a periodic acoustic signal, expressed in cycles per second or Hertz.
Impulsive	Sound of short duration, usually less than one second, with an abrupt onset and rapid decay.
Ldn	Day/Night Average Sound Level. Similar to CNEL but with no evening weighting.
Leq	Equivalent or energy-averaged sound level.
Lmax	The highest root-mean-square (RMS) sound level measured over a given period of time.
L(n)	The sound level exceeded a described percentile over a measurement period. For instance, an hourly L50 is the sound level exceeded 50 percent of the time during the one hour period.
Loudness	A subjective term for the sensation of the magnitude of sound.
Noise	Unwanted sound.
SEL	Sound exposure levels. A rating, in decibels, of a discrete event, such as an aircraft flyover or train passby, that compresses the total sound energy into a one-second event.

FUNDAMENTALS OF ACOUSTICS

Acoustics is the science of sound. Sound may be thought of as mechanical energy of a vibrating object transmitted by pressure waves through a medium to human (or animal) ears. If the pressure variations occur frequently enough (at least 20 times per second), then they can be heard and are called sound. The number of pressure variations per second is called the frequency of sound, and is expressed as cycles per second or Hertz (Hz).

Noise is a subjective reaction to different types of sounds. Noise is typically defined as (airborne) sound that is loud, unpleasant, unexpected or undesired, and may therefore be classified as a more specific group of sounds. Perceptions of sound and noise are highly subjective from person to person.

Measuring sound directly in terms of pressure would require a very large and awkward range of numbers. To avoid this, the decibel scale was devised. The decibel scale uses the hearing threshold (20 micropascals), as a point of reference, defined as 0 dB. Other sound pressures are then compared to this reference pressure, and the logarithm is taken to keep the numbers in a practical range. The decibel scale allows a million-fold increase in pressure to be expressed as 120 dB, and changes in levels (dB) correspond closely to human perception of relative loudness.

The perceived loudness of sounds is dependent upon many factors, including sound pressure level and frequency content. However, within the usual range of environmental noise levels, perception of loudness is relatively predictable, and can be approximated by A-weighted sound levels. There is a strong correlation between A-weighted sound levels (expressed as dBA) and the way the human ear perceives sound. For this reason, the A-weighted sound level has become the standard tool of environmental noise assessment. All noise levels reported in this section are in terms of A-weighted levels, but are expressed as dB, unless otherwise noted.

The decibel scale is logarithmic, not linear. In other words, two sound levels 10 dB apart differ in acoustic energy by a factor of 10. When the standard logarithmic decibel is A-weighted, an increase of 10 dBA is generally perceived as a doubling in loudness. For example, a 70 dBA sound is half as loud as an 80 dBA sound, and twice as loud as a 60 dBA sound.

Community noise is commonly described in terms of the ambient noise level, which is defined as the all-encompassing noise level associated with a given environment. A common statistical tool to measure the ambient noise level is the average, or equivalent, sound level (Leq), which corresponds to a steady-state A weighted sound level containing the same total energy as a time varying signal over a given time period (usually one hour). The Leq is the foundation of the composite noise descriptor, Ldn, and shows very good correlation with community response to noise.

The day/night average level (Ldn) is based upon the average noise level over a 24-hour day, with a +10 decibel weighing applied to noise occurring during nighttime (10:00 p.m. to 7:00 a.m.) hours. The nighttime penalty is based upon the assumption that people react to nighttime noise exposures as though they were twice as loud as daytime exposures. Because Ldn represents a 24-

hour average, it tends to disguise short-term variations in the noise environment. CNEL is similar to Ldn, but includes a +5 dB penalty for evening noise. Table 1 lists several examples of the noise levels associated with common situations.

TABLE 1 : TYPICAL NOISE LEVELS

COMMON OUTDOOR ACTIVITIES	NOISE LEVEL (DBA)	COMMON INDOOR ACTIVITIES
	--110--	Rock Band
Jet Fly-over at 300 m (1,000 ft)	--100--	
Gas Lawn Mower at 1 m (3 ft)	--90--	
Diesel Truck at 15 m (50 ft), at 80 km/hr (50 mph)	--80--	Food Blender at 1 m (3 ft) Garbage Disposal at 1 m (3 ft)
Noisy Urban Area, Daytime Gas Lawn Mower, 30 m (100 ft)	--70--	Vacuum Cleaner at 3 m (10 ft)
Commercial Area Heavy Traffic at 90 m (300 ft)	--60--	Normal Speech at 1 m (3 ft)
Quiet Urban Daytime	--50--	Large Business Office Dishwasher in Next Room
Quiet Urban Nighttime	--40--	Theater, Large Conference Room (Background)
Quiet Suburban Nighttime	--30--	Library
Quiet Rural Nighttime	--20--	Bedroom at Night, Concert Hall (Background)
	--10--	Broadcast/Recording Studio
Lowest Threshold of Human Hearing	--0--	Lowest Threshold of Human Hearing

SOURCE: CALTRANS, TECHNICAL NOISE SUPPLEMENT, TRAFFIC NOISE ANALYSIS PROTOCOL. NOVEMBER 2009.

EFFECTS OF NOISE ON PEOPLE

The effects of noise on people can be placed in three categories:

- Subjective effects of annoyance, nuisance, and dissatisfaction;
- Interference with activities such as speech, sleep, and learning; and
- Physiological effects such as hearing loss or sudden startling.

Environmental noise typically produces effects in the first two categories. Workers in industrial plants can experience noise in the last category. There is no completely satisfactory way to measure the subjective effects of noise or the corresponding reactions of annoyance and dissatisfaction. A wide variation in individual thresholds of annoyance exists and different tolerances to noise tend to develop based on an individual's past experiences with noise.

Thus, an important way of predicting a human reaction to a new noise environment is the way it compares to the existing environment to which one has adapted: the so-called ambient noise level. In general, the more a new noise exceeds the previously existing ambient noise level, the less acceptable the new noise will be judged by those hearing it.

With regard to increases in A-weighted noise level, the following relationships occur:

- Except in carefully controlled laboratory experiments, a change of 1 dBA cannot be perceived;
- Outside of the laboratory, a 3 dBA change is considered a just-perceivable difference;
- A change in level of at least 5 dBA is required before any noticeable change in human response would be expected; and
- A 10 dBA change is subjectively heard as approximately a doubling in loudness, and can cause an adverse response.

Stationary point sources of noise – including stationary mobile sources such as idling vehicles – attenuate (lessen) at a rate of approximately 6 dB per doubling of distance from the source, depending on environmental conditions (i.e. atmospheric conditions and either vegetative or manufactured noise barriers, etc.). Widely distributed noises, such as a large industrial facility spread over many acres, or a street with moving vehicles, would typically attenuate at a lower rate.

EXISTING NOISE LEVELS

Traffic Noise Levels

The FHWA Highway Traffic Noise Prediction Model (FHWA-RD 77-108) was used to develop Ldn (24-hour average) noise contours for the primary project-area roadways. The model is based upon the CALVENO noise emission factors for automobiles, medium trucks, and heavy trucks, with consideration given to vehicle volume, speed, roadway configuration, distance to the receiver, and the acoustical characteristics of the site. The FHWA Model predicts hourly Leq values for free-flowing traffic conditions, and is generally considered to be accurate within 1.5 dB. To predict Ldn values, it is necessary to determine the hourly distribution of traffic for a typical 24-hour period.

Existing traffic volumes were obtained from the traffic study prepared for the project (Abrams Associates Traffic Engineering, Inc., December 10, 2013). Day/night traffic distributions were based upon file data for similar roadways. Using these data sources and the FHWA traffic noise prediction methodology, traffic noise levels were calculated for existing conditions. Table 2 shows the results of this analysis. Appendix A provides the complete inputs and results for the FHWA traffic noise modeling.

Traffic noise levels are predicted at the sensitive receptors located at the closest typical setback distance along each project-area roadway segments. In some locations sensitive receptors may be located at distances which vary from the assumed calculation distance and may experience shielding from intervening barriers or sound walls. However, the traffic noise analysis is believed to be representative of the majority of sensitive receptors located closest to the project-area roadway segments analyzed in this report.

The actual distances to noise level contours may vary from the distances predicted by the FHWA model due to roadway curvature, grade, shielding from local topography or structures, elevated

roadways, or elevated receivers. The distances reported in Table 2 are generally considered to be conservative estimates of noise exposure along the project-area roadways.

TABLE 2: PREDICTED EXISTING TRAFFIC NOISE LEVELS

ROADWAY	SEGMENT	NOISE LEVEL AT CLOSEST RECEPTORS (LDN)	DISTANCES TO TRAFFIC NOISE CONTOURS, LDN (FEET)		
			70 DB	65 DB	60 DB
MORELLO AVE	NORTH OF SR-4	62.5	19	41	88
MORELLO AVE	NORTH OF MUIR RD	61.0	15	32	70
MORELLO AVE	MUIR RD TO CENTER AVE	60.9	15	32	69
MORELLO AVE	WEST PROJECT ENTRANCE TO CENTER AVE	N/A	N/A	N/A	N/A
MORELLO AVE	SOUTH OF CENTER AVE	57.9	9	20	43
CENTER AVE	WEST OF MORELLO AVE	54.6	6	12	26
CENTER AVE	MORELLO AVE TO VINE HILL WAY	52.9	4	9	20
CENTER AVE	EAST OF VINE HILL WAY	53.4	5	10	22
MUIR RD	WEST OF MORELLO WAY	57.1	8	18	38
MUIR RD	EAST OF MORELLO WAY	57.1	8	18	38
VINE HILL WAY	SOUTH OF CENTER AVE	52.2	4	8	18
VINE HILL WAY	CENTER AVE TO EAST PROJECT ENTRANCE	50.4	3	6	14
VINE HILL WAY	NORTH OF PROJECT ENTRANCE	N/A	N/A	N/A	N/A

NOTES: DISTANCES TO TRAFFIC NOISE CONTOURS ARE MEASURED IN FEET FROM THE CENTERLINES OF THE ROADWAYS.
SOURCE: FHWA-RD-77-108 with inputs from Abrams Associates and j.c. brennan & associates, Inc. 2013.

Aviation Noise Levels

Buchanan Field is the older of the two publicly owned airports in Contra Costa County. The airport dates from 1942 when the county acquired the property. The facility served as an Army air base during World War II, at which time the two original runways were constructed. Public use began in 1946 and has been continuous ever since.

Many modifications to individual components of the runway/taxiway system have been made over the years, but the basic configuration is essentially unchanged from when the airport opened. In particular, the airport's two major runways — now designated 1L-19R (oriented northeast/southwest) and 14L-32R (oriented northwest/southeast) — continue to have their original physical length despite several changes to landing threshold placement and usable length. Among the notable additions to the airfield was the construction during the 1960s of a shorter runway adjacent to each of the two primary runways. Also, from 1949 until 1967, a short, roughly east/west-oriented runway (now a taxiway) was in use.

Today, Buchanan Field Airport occupies a total of some 495 acres of property and controls aviation easements on an additional 50± acres. With extensive urban development on all sides, no significant changes in the airport's size or configuration are feasible. The most recent airport

master plan, adopted in 1990, focuses primarily on building area improvements such as a potential terminal building and additional aircraft hangars. Future enhancements to instrument approach procedures are anticipated in the plan, but no physical extension of the runways or other major runway system changes are proposed.

The most recent estimate of annual operations is 237,000 flights per year (1999). As of 1999, 592 aircraft were based at the airport. Airport operations are forecast to increase to 320,000 in the future (Contra Costa County Airport Land Use Compatibility Plan, December 2000).

Figure 3 shows the most recent noise contours developed for the airport.

COMMUNITY NOISE SURVEY

A community noise survey was conducted to document existing ambient noise levels at the project site. The data collected included the hourly average (Leq), median (L50), and the maximum level (Lmax) during the measurement period. Noise monitoring sites and the measured noise levels at each site are summarized in Table 3. Figure 1 shows the locations of the noise monitoring sites.

Community noise monitoring equipment included a Larson Davis Laboratories (LDL) Model 824 precision integrating sound level meter equipped with an LDL ½" microphone. The measurement system was calibrated using a LDL Model CAL200 acoustical calibrator before and after testing. The measurement equipment meets all of the pertinent requirements of the American National Standards Institute (ANSI) for Type 1 (precision) sound level meters.

TABLE 3: EXISTING AMBIENT NOISE MONITORING RESULTS

SITE	LOCATION	LDN (DBA)	MEASURED HOURLY NOISE LEVELS, DBA					
			DAYTIME (7:00 AM - 10:00 PM)			NIGHTTIME (10:00 PM – 7:00 AM)		
			LEQ	L50	LMAX	LEQ	L50	LMAX
A	West side of site. 60 feet to centerline of Morello Avenue.	NA	62.3	57.3	72.0	NA		
B	East side of site. 60 feet to centerline of Vine Hill Way.	NA	52.6	49.5	66.6	NA		
C	South side of site. 75 feet to centerline of Center Avenue.	NA	53.3	47.6	64.3	NA		

SOURCE: J.C. BRENNAN & ASSOCIATES, INC. - 2013

The results of the community noise survey shown in Table 3 indicate that existing transportation noise sources were the primary contributor to ambient noise on the project site.

REGULATORY FRAMEWORK

STATE

Governor's Office of Planning and Research (OPR)

The *State of California General Plan Guidelines* (State of California 1998), published by OPR provides guidance for the acceptability of projects within specific CNEL contours. The guidelines also present adjustment factors that may be used in order to arrive at noise acceptability standards that reflect the noise control goals of the community, the particular community's sensitivity to noise, and the community's assessment of the relative importance of noise pollution.

LOCAL

City of Martinez General Plan

The City of Martinez Noise Element establishes a land use compatibility criterion of 60 dB Ldn at the outdoor activity areas of residential land uses. The intent of this standard is to provide an acceptable noise environment for outdoor activities. In addition, an interior noise level criterion of 45 dB Ldn is applied to all residential land uses. The intent of this standard is to provide a suitable environment for indoor communication and sleep. Where it is not possible to reduce noise in outdoor activity areas to 60 dB Ldn or less using a practical application of the best available noise reduction measures, an exterior noise level of up to 70 dB Ldn may be allowed provided that available exterior noise level reduction measures have been implemented and interior noise levels are in compliance with the 45 dB Ldn standard.

City of Martinez Municipal Code, Chapter 8.34 (Noise Control)

The City of Martinez Municipal Code also establishes acceptable noise level standards of 60 dB Ldn (exterior) and 45 dB Ldn (interior).

Additionally, the hours of operation for noise-producing construction equipment are also restricted through the Municipal Code. The operation of pile drivers, steam shovels, and pneumatic hammers used in construction, demolition, or other repair work, should be prohibited before 7:00 a.m. or after 7:00 p.m. Monday through Friday, and before 9:00 a.m. or after 5:00 p.m. on Saturdays, Sundays, and State, federal, or local holidays.

Contra Costa County Airport Land Use Compatibility Plan

The proposed project is located within the Airport Influence Area for the Buchanan Field Airport, as shown by Figure 3. The Buchanan Field Airport Policies contained within the Contra Costa County Airport Land Use Compatibility Plan establishes acceptable exterior aircraft noise levels of 55 dB CNEL for single-family residential uses.

IMPACTS AND MITIGATION MEASURES

THRESHOLDS OF SIGNIFICANCE

Consistent with Appendix G of the CEQA Guidelines, the project will have a significant impact related to noise if it will result in:

- Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies;
- Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels;
- A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project;
- A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without project;
- For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, expose people residing or working in the project area to excessive noise levels within two miles of a public airport or public use airport; or
- For a project within the vicinity of a private airstrip, expose people residing or working in the project area to excessive noise levels.

Noise Standards

The noise standards applicable to the project include the relevant portions of the City of Martinez General Plan as described in the Regulatory Framework section above, and the following standards.

Generally, a project may have a significant effect on the environment if it will substantially increase the ambient noise levels for adjoining areas or expose people to severe noise levels. In practice, more specific professional standards have been developed. These standards state that a noise impact may be considered significant if it would generate noise that would conflict with local project criteria or ordinances, or substantially increase noise levels at noise sensitive land uses. The potential increase in traffic noise from the project is a factor in determining significance. Research into the human perception of changes in sound level indicates the following:

- A 3-dB change is barely perceptible,
- A 5-dB change is clearly perceptible, and
- A 10-dB change is perceived as being twice or half as loud.

A limitation of using a single noise level increase value to evaluate noise impacts is that it fails to account for pre-project-noise conditions. Table 4 is based upon recommendations made by the Federal Interagency Committee on Noise (FICON) to provide guidance in the assessment of changes in ambient noise levels resulting from aircraft operations. The recommendations are based upon studies that relate aircraft noise levels to the percentage of persons highly annoyed by the noise. Although the FICON recommendations were specifically developed to assess aircraft noise impacts, it has been accepted that they are applicable to all sources of noise described in terms of cumulative noise exposure metrics such as the Ldn.

TABLE 4: SIGNIFICANCE OF CHANGES IN NOISE EXPOSURE

AMBIENT NOISE LEVEL WITHOUT PROJECT, LDN	INCREASE REQUIRED FOR SIGNIFICANT IMPACT
<60 dB	+5.0 dB or more
60-65 dB	+3.0 dB or more
>65 dB	+1.5 dB or more

SOURCE: FEDERAL INTERAGENCY COMMITTEE ON NOISE (FICON)

Based on the Table 4 data, an increase in the traffic noise level of 5 dB or more would be significant where the pre-project noise level is less than 60 dB Ldn. Extending this concept to higher noise levels, an increase in the traffic noise level of 1.5 dB or more may be significant where the pre-project traffic noise level exceeds 65 dB Ldn. The rationale for the Table 4 criteria is that, as ambient noise levels increase, a smaller increase in noise resulting from a project is sufficient to cause annoyance.

Vibration Standards

Vibration is like noise in that it involves a source, a transmission path, and a receiver. While vibration is related to noise, it differs in that in that noise is generally considered to be pressure waves transmitted through air, whereas vibration usually consists of the excitation of a structure or surface. As with noise, vibration consists of an amplitude and frequency. A person's perception to the vibration will depend on their individual sensitivity to vibration, as well as the amplitude and frequency of the source and the response of the system which is vibrating.

Vibration can be measured in terms of acceleration, velocity, or displacement. A common practice is to monitor vibration measures in terms of peak particle velocities in inches per second. Standards pertaining to perception as well as damage to structures have been developed for vibration levels defined in terms of peak particle velocities.

The Butte County does not have specific policies pertaining to vibration levels. However, vibration levels associated with construction activities and railroad operations are addressed as potential noise impacts associated with project implementation.

Human and structural response to different vibration levels is influenced by a number of factors, including ground type, distance between source and receptor, duration, and the number of perceived vibration events. Table 5 indicates that the threshold for damage to structures ranges from 0.2 to 0.6 peak particle velocity in inches per second (in/sec p.p.v). The general threshold at which human annoyance could occur is notes as 0.1 in/sec p.p.v.

TABLE 5: EFFECTS OF VIBRATION ON PEOPLE AND BUILDINGS

PEAK PARTICLE VELOCITY INCHES/SECOND	PEAK PARTICLE VELOCITY MM/SECOND	HUMAN REACTION	EFFECT ON BUILDINGS
0.15-0.30	0.006-0.019	Threshold of perception; possibility of intrusion	Vibrations unlikely to cause damage of any type
2.0	0.08	Vibrations readily perceptible	Recommended upper level of the vibration to which ruins and ancient monuments should be subjected
2.5	0.10	Level at which continuous vibrations begin to annoy people	Virtually no risk of "architectural" damage to normal buildings
5.0	0.20	Vibrations annoying to people in buildings (this agrees with the levels established for people standing on bridges and subjected to relative short periods of vibrations)	Threshold at which there is a risk of "architectural" damage to normal dwelling - houses with plastered walls and ceilings Special types of finish such as lining of walls, flexible ceiling treatment, etc., would minimize "architectural" damage
10-15	0.4-0.6	Vibrations considered unpleasant by people subjected to continuous vibrations and unacceptable to some people walking on bridges	Vibrations at a greater level than normally expected from traffic, but would cause "architectural" damage and possibly minor structural damage.

SOURCE: CALTRANS. TRANSPORTATION RELATED EARTHBORNE VIBRATIONS. TAV-02-01-R9601 FEBRUARY 20, 2002.

IMPACT 1: EXPOSURE OF PERSONS TO, OR GENERATION OF NOISE LEVELS IN EXCESS OF APPLICABLE STANDARDS OR A SUBSTANTIAL PERMANENT INCREASE IN AMBIENT NOISE LEVELS IN THE PROJECT VICINITY ABOVE LEVELS EXISTING WITHOUT THE PROJECT - TRAFFIC NOISE AT EXISTING RECEPTORS (LESS THAN SIGNIFICANT)

To describe future noise levels due to traffic, the Federal Highway Administration Highway Traffic Noise Prediction Model (FHWA RD-77-108) was used. Inputs to the model included traffic volumes provided by Abrams Associates. The FHWA model is based upon the Calveno reference noise factors for automobiles, medium trucks and heavy trucks, with consideration given to vehicle volume, speed, roadway configuration, distance to the receiver, and the acoustical characteristics of the site. The FHWA model was developed to predict hourly Leq values for free-flowing traffic conditions. To predict Ldn/CNEL values, it is necessary to determine the day/night distribution of traffic and adjust the traffic volume input data to yield an equivalent hourly traffic volume.

Tables 6 and 7 show the noise levels associated with traffic on the local roadway network under the existing/background and existing/background plus project traffic conditions. As indicated by Tables 6 and 7, the related noise level increases under development of the proposed project are predicted to range between 0.1 to 1.3 dB.

TABLE 6: EXISTING TRAFFIC NOISE LEVELS VS. EXISTING PLUS PROJECT TRAFFIC NOISE LEVELS

ROADWAY	SEGMENT	NOISE LEVELS (LDN, DB)			DISTANCE TO EXISTING + PROJECT TRAFFIC NOISE CONTOURS, FEET[1]		
		EXISTING	EXISTING + PROJECT	CHANGE (DB)	70 DB LDN	65 DB LDN	60 DB LDN
Morello Ave	North of SR-4	62.5	62.5	0.0	19	41	88
Morello Ave	North of Muir Rd	61.0	61.4	0.5	16	35	75
Morello Ave	Muir Rd to Center Ave	60.9	61.2	0.3	15	33	72
Morello Ave	West Project Entrance to Center Ave	N/A	57.6	N/A	9	19	41
Morello Ave	South of Center Ave	57.9	57.9	0.0	9	20	43
Center Ave	West of Morello Ave	54.6	54.7	0.1	6	12	27
Center Ave	Morello Ave to Vine Hill Way	52.9	53.0	0.1	4	9	20
Center Ave	East of Vine Hill Way	53.4	53.5	0.1	5	10	22
Muir Rd	West of Morello Way	57.1	57.2	0.1	8	18	39
Muir Rd	East of Morello Way	57.1	57.2	0.1	8	18	39
Vine Hill Way	South of Center Ave	52.2	52.2	0.0	4	8	18
Vine Hill Way	Center Ave to East Project Entrance	50.4	50.8	0.4	3	7	15
Vine Hill Way	North of Project Entrance	N/A	51.0	N/A	3	7	15

[1] *Distances to traffic noise contours are measured in feet from the centerlines of the roadways. Actual distances may vary due to shielding from existing noise barriers or intervening structures. Traffic noise levels may vary depending on actual setback distances and localized shielding.*

SOURCE: FHWA-RD-77-108 WITH INPUTS FROM ABRAMS ASSOCIATES AND J.C. BRENNAN & ASSOCIATES, INC. 2013.

TABLE 7: BACKGROUND TRAFFIC NOISE LEVELS VS. BACKGROUND PLUS PROJECT TRAFFIC NOISE LEVELS

ROADWAY	SEGMENT	NOISE LEVELS (LDN, DB)			DISTANCE TO BACKGROUND + PROJECT TRAFFIC NOISE CONTOURS, FEET[1]		
		BACKGROUND	BACKGROUND + PROJECT	CHANGE (DB)	70 DB LDN	65 DB LDN	60 DB LDN
Morello Ave	North of SR-4	62.6	62.6	0.0	19	41	89
Morello Ave	North of Muir Rd	61.4	61.5	0.1	16	35	76
Morello Ave	Muir Rd to Center Ave	61.0	61.2	0.2	16	34	72
Morello Ave	West Project Entrance to Center Ave	N/A	57.7	N/A	9	19	42
Morello Ave	South of Center Ave	57.9	58.0	0.0	9	20	44
Center Ave	West of Morello Ave	53.4	54.8	1.3	6	12	27
Center Ave	Morello Ave to Vine Hill Way	53.0	53.0	0.1	4	10	21
Center Ave	East of Vine Hill Way	53.5	53.6	0.1	5	10	22
Muir Rd	West of Morello Way	57.2	57.3	0.1	9	18	39
Muir Rd	East of Morello Way	57.2	57.3	0.1	8	18	39
Vine Hill Way	South of Center Ave	52.2	52.3	0.0	4	8	18
Vine Hill Way	Center Ave to East Project Entrance	50.5	50.9	0.4	3	7	15
Vine Hill Way	North of Project Entrance	N/A	50.7	N/A	3	7	14

[1] *Distances to traffic noise contours are measured in feet from the centerlines of the roadways. Actual distances may vary due to shielding from existing noise barriers or intervening structures. Traffic noise levels may vary depending on actual setback distances and localized shielding.*

SOURCE: FHWA-RD-77-108 WITH INPUTS FROM ABRAMS ASSOCIATES AND J.C. BRENNAN & ASSOCIATES, INC. 2013.

IMPACT 2: POTENTIAL TO EXPOSE PERSONS TO, OR GENERATE NOISE LEVELS IN EXCESS OF APPLICABLE STANDARDS OR TO RESULT IN A SUBSTANTIAL TEMPORARY OR PERIODIC INCREASE IN AMBIENT NOISE LEVELS IN THE PROJECT VICINITY ABOVE LEVELS EXISTING WITHOUT PROJECT - CONSTRUCTION NOISE (SIGNIFICANT)

The new development, maintenance of roadways, installation of public utilities, and infrastructure improvements associated with the project will require construction activities. These activities include the use of heavy equipment and impact tools. Table 8 provides a list of the types of equipment which may be associated with construction activities and the associated noise levels.

TABLE 8: CONSTRUCTION EQUIPMENT NOISE

TYPE OF EQUIPMENT	PREDICTED NOISE LEVELS, LMAX DB				DISTANCES TO NOISE CONTOURS (FEET)	
	NOISE LEVEL AT 50'	NOISE LEVEL AT 100'	NOISE LEVEL AT 200'	NOISE LEVEL AT 400'	70 DB LMAX CONTOUR	65 DB LMAX CONTOUR
Backhoe	78	72	66	60	126	223
Compactor	83	77	71	65	223	397
Compressor (air)	78	72	66	60	126	223
Concrete Saw	90	84	78	72	500	889
Dozer	82	76	70	64	199	354
Dump Truck	76	70	64	58	100	177
Excavator	81	75	69	63	177	315
Generator	81	75	69	63	177	315
Jackhammer	89	83	77	71	446	792
Pneumatic Tools	85	79	73	67	281	500

SOURCE: ROADWAY CONSTRUCTION NOISE MODEL USER'S GUIDE. FEDERAL HIGHWAY ADMINISTRATION. FHWA-HEP-05-054. JANUARY 2006. J.C. BRENNAN & ASSOCIATES, INC. 2013.

Activities involved in project construction would typically generate maximum noise levels ranging from 85 to 90 dB at a distance of 50 feet. The nearest residential receptors would be located 50 feet or more from construction activities.

Construction could result in periods of elevated ambient noise levels and the potential for annoyance. However, the City of Martinez Municipal Code exempts noise from construction activities during the daytime hours of 7:00 a.m. to 7:00 p.m. daily, except Saturday, Sunday, and State, Federal or Local Holidays, when the allowable time would be 9:00 a.m. to 5:00 p.m.

Because all construction activities will be subject to the requirements of the City of Martinez Municipal Code with respect to limits on construction noise, this would be a **less than significant** impact.

Impact 3: Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels (Potentially Significant)

The primary vibration-generating activities associated with the proposed project would occur during construction when activities such as grading, utilities placement, and roadway construction occur. Sensitive receptors which could be impacted by construction related vibrations, especially vibratory compactors/rollers, are located approximately 50 feet or further from the project site. At this distance construction vibrations are not predicted to exceed acceptable levels. Additionally, construction activities would be temporary in nature and would likely occur during normal daytime working hours.

Construction vibration impacts include human annoyance and building structural damage. Human annoyance occurs when construction vibration rises significantly above the threshold of perception. Building damage can take the form of cosmetic or structural. Table 9 shows the typical vibration levels produced by construction equipment.

Table 9: Vibration Levels for Varying Construction Equipment

Type of Equipment	*Peak Particle Velocity @ 25 feet (inches/second)*	*Peak Particle Velocity @ 50 feet (inches/second)*	*Peak Particle Velocity @ 100 feet (inches/second)*
Large Bulldozer	0.089	0.031	0.011
Loaded Trucks	0.076	0.027	0.010
Small Bulldozer	0.003	0.001	0.000
Auger/drill Rigs	0.089	0.031	0.011
Jackhammer	0.035	0.012	0.004
Vibratory Hammer	0.070	0.025	0.009
Vibratory Compactor/roller	0.210 (<0.200 @ 26')	0.074	0.026

Source: Federal Transit Administration, Transit Noise and Vibration Impact Assessment Guidelines, May 2006

The Table 9 data indicate that construction vibration levels anticipated for the project are less than the 0.2 in/sec p.p.v. threshold of damage to buildings and less than the 0.1 in/sec threshold of annoyance criteria at distances of 50 feet. Therefore, construction vibrations are not predicted to cause damage to existing buildings or cause annoyance to sensitive receptors. Therefore, this impact would be considered **less than significant.**

IMPACT 4: EXPOSURE OF PERSONS TO, OR GENERATION OF NOISE LEVELS IN EXCESS OF STANDARDS ESTABLISHED IN THE LOCAL GENERAL PLAN OR NOISE ORDINANCE – TRAFFIC NOISE AT NEW RECEPTORS (LESS THAN SIGNIFICANT)

The FHWA traffic noise prediction model was used to predict Cumulative + Project traffic noise levels at the proposed residential uses associated with the project. Table 10 shows the predicted traffic noise levels at the proposed residential uses adjacent to the major project-area roadways.

Appendix B provides the complete inputs and results to the FHWA traffic noise prediction model.

TABLE 10: CUMULATIVE + PROJECT TRANSPORTATION NOISE LEVELS AT PROPOSED RESIDENTIAL USES

Roadway	Receptor Description	Approximate Residential Setback, feet[1]	ADT	Predicted Traffic Noise Levels, Ldn			
				No Wall	6' Wall	7' Wall	8' Wall
Morello Ave.	Lot 1 Backyard / First Floor Façade	130'	15,060	56 dB	--	--	--
Center Ave.	Lots 35-47 Backyards / First Floor Façade	80'	2,710	52 dB	--	--	--
Vine Hill Way	Lots 24-34 Backyards / First Floor Façade	75'	1,710	50 dB	--	--	--

[1] SETBACK DISTANCES ARE MEASURED IN FEET FROM THE CENTERLINES OF THE ROADWAYS TO THE CENTER OF RESIDENTIAL BACKYARDS.
-- MEETS THE CITY OF MARTINEZ EXTERIOR NOISE STANDARD WITHOUT MITIGATION.
SOURCE: FHWA-RD-77-108 WITH INPUTS FROM ABRAMS ASSOCIATES, AND J.C. BRENNAN & ASSOCIATES, INC. 2013.

The Table 10 data indicate that no additional noise control measures would be required to achieve compliance with the City of Martinez 60 dB Ldn exterior noise level standard for the proposed residential uses.

Interior Noise Impacts:

Modern construction typically provides a 25 dB exterior-to-interior noise level reduction with windows closed. Therefore, sensitive receptors exposed to exterior noise of 70 dB L_{dn}, or less, will typically comply with the City of Martinez 45 dB L_{dn} interior noise level standard. Additional noise reduction measures, such as acoustically rated windows are generally required for exterior noise levels exceeding 70 dB L_{dn}.

It should be noted that exterior noise levels are typically 2-3 dB higher at second floor locations. The proposed residential uses are predicted to be exposed to first floor exterior transportation noise levels ranging between 50 to 56 dB Ldn. Therefore, second floor facades are predicted to be exposed to exterior noise levels of up to 53-59 dB Ldn. Based upon a 25 dB exterior-to-interior noise level reduction, interior noise levels are predicted to range between 28 to 34 dB Ldn. Within windows open a 15 dB exterior-to-interior noise level reduction is typically achieve. Therefore, interior noise levels are

predicted to be 38-44 dB Ldn. These interior noise levels would comply with the City of Martinez 45 dB Ldn interior noise level standard and no interior noise mitigation would be required.

The proposed project is not predicted to be exposed to exterior or interior noise level exceeding the City's allowable standards. Therefore, this impact would be considered **less than significant.**

IMPACT 5: FOR PROJECTS LOCATED WITHIN AN AIRPORT LAND USE PLAN, WITHIN TWO MILES OF A PUBLIC AIRPORT OR PUBLIC USE AIRPORT FOR WHICH AN AIRPORT LAND USE PLAN HAS NOT BEEN ADOPTED, OR WITHIN THE VICINITY OF A PRIVATE AIRPORT, POTENTIAL TO EXPOSE PEOPLE RESIDING OR WORKING IN THE PROJECT AREA TO EXCESSIVE NOISE LEVELS (LESS THAN SIGNIFICANT)

The most recent noise contours for Buchannan field indicated that the project site is located outside of the 55 dB CNEL noise contours, as shown by Figure 3. Therefore, the proposed project would not result in the creation of new noise-sensitive land uses within the 55 dB CNEL Buchannan Field noise contour. This would comply with the Contra Costa County Airport Land Use Compatibility standard of 55 dB CNEL for aircraft noise and the City's 60 dB Ldn exterior noise level standard. Therefore, noise impacts relative to airports would be **less than significant**.

IMPACT 6: POTENTIAL TO EXPOSE OF PERSONS TO, OR GENERATE NOISE LEVELS IN EXCESS OF STANDARDS ESTABLISHED IN THE LOCAL GENERAL PLAN OR NOISE ORDINANCE, OR APPLICABLE STANDARDS OF OTHER AGENCIES OR TO RESULT IN A SUBSTANTIAL PERMANENT INCREASE IN AMBIENT NOISE LEVELS IN THE PROJECT VICINITY ABOVE LEVELS EXISTING WITHOUT THE PROJECT (LESS THAN CUMULATIVELY CONSIDERABLE)

The cumulative context for noise impacts associated with the Proposed Project consists of the existing and future noise sources that could affect the project or surrounding uses. Noise generated by construction would be temporary, and would not add to the permanent noise environment or be considered as part of the cumulative context. The total noise impact of the Proposed Project would be fairly small and would not be a substantial increase to the existing future noise environment.

TRAFFIC

Cumulative noise impacts would occur primarily as a result of increased traffic on local roadways due to the proposed project and other projects within the area. Tables 11 show cumulative traffic noise levels with and without the proposed project.

Under cumulative conditions, there would not be significant increases in noise levels compared to the no project conditions. However, the 60, 65 and 70 dB Ldn contours would extend farther under cumulative conditions and potentially impact additional sensitive receptors. As shown, the proposed project would contribute no more than 1.3 dB Ldn to noise levels on roadways fronting residential uses along the study area roadways. Additionally, the project would not cause new exceedances of the City of Martinez 60 dB Ldn exterior noise level standard. The traffic noise from the Proposed Project is not expected to produce noise levels that would exceed City standards. Increased project related traffic would increase traffic noise levels by less than the FICON criteria shown in Table 4, at existing sensitive receptors. Consequently, this would result in a **less than cumulatively considerable** contribution to cumulative noise levels.

TABLE 11: CUMULATIVE NO PROJECT VS. CUMULATIVE PLUS PROJECT

Roadway	Segment	Noise Levels (Ldn, dB)			Distance to Cumulative + Project Traffic Noise Contours, feet[1]		
		Cumulative No Project	Cumulative + Project	Change (dB)	70 dB Ldn	65 dB Ldn	60 dB Ldn
Morello Ave	North of SR-4	63.0	63.0	0.0	21	44	96
Morello Ave	North of Muir Rd	61.9	62.0	0.2	18	38	82
Morello Ave	Muir Rd to Center Ave	60.8	60.9	0.2	15	32	69
Morello Ave	West Project Entrance to Center Ave	N/A	58.1	N/A	10	21	45
Morello Ave	South of Center Ave	58.4	58.4	0.0	10	22	47
Center Ave	West of Morello Ave	55.1	55.2	0.1	6	13	29
Center Ave	Morello Ave to Vine Hill Way	53.4	53.5	0.0	5	10	22
Center Ave	East of Vine Hill Way	53.9	54.0	0.1	5	11	24
Muir Rd	West of Morello Way	57.6	57.7	0.1	9	20	42
Muir Rd	East of Morello Way	57.6	57.7	0.1	9	20	42
Vine Hill Way	South of Center Ave	52.7	52.7	0.0	4	9	20
Vine Hill Way	Center Ave to East Project Entrance	50.9	51.2	0.4	3	7	16
Vine Hill Way	North of Project Entrance	N/A	51.5	N/A	3	8	16

[1] *Distances to traffic noise contours are measured in feet from the centerlines of the roadways. Actual distances may vary due to shielding from existing noise barriers or intervening structures. Traffic noise levels may vary depending on actual setback distances and localized shielding.*

SOURCE: FHWA-RD-77-108 WITH INPUTS FROM ABRAMS ASSOCIATES, INC. AND J.C. BRENNAN & ASSOCIATES, INC. 2013.

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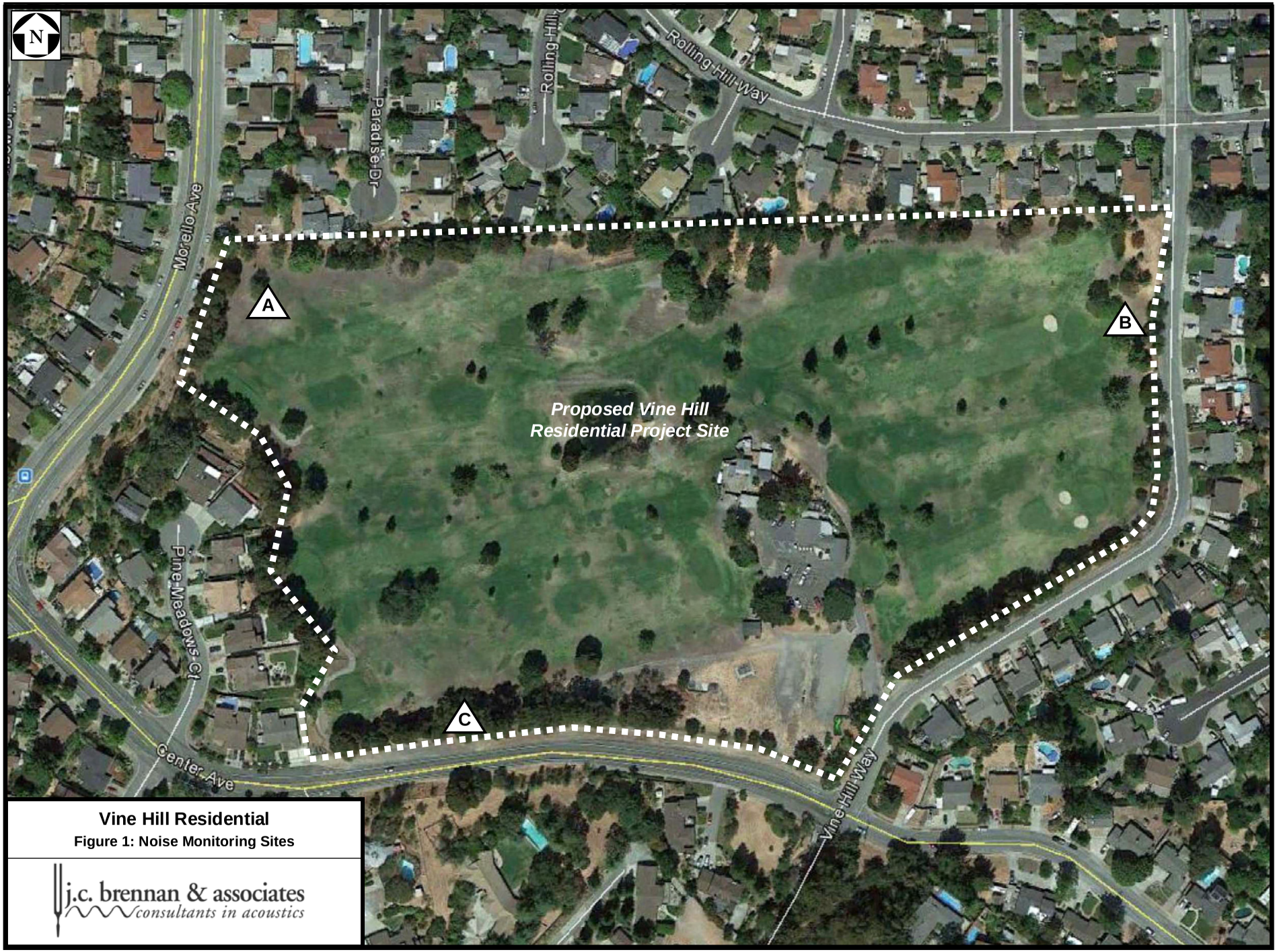

Vine Hill Residential

Figure 1: Noise Monitoring Sites

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LINE TABLE		
NO.	BEARING	LENGTH
L1	N82°45'05"W	52.77'
L2	N82°24'32"W	119.23'
L3	N06°16'00"W	100.00'
L4	N06°27'20"E	63.39'
L5	N44°20'02"W	121.63'
L6	N11°09'17"E	144.73'
L7	N35°32'16"W	68.82'
L8	N82°33'37"W	58.59'
L9	N54°39'37"W	112.46'
L10	N15°51'35"E	169.79'

CURVE TABLE			
NO.	RADIUS	DELTA	LENGTH
C1	140.00'	65°29'51"	160.04'
C2	30.00'	93°49'47"	49.13'
C3	542.00'	19°39'27"	185.95'
C4	542.00'	13°53'28"	131.41'

12. UTILITY PROVIDERS:

SEWER	MOUNTAIN VIEW SANITARY DISTRICT (MVSD)
WATER	CONTRA COSTA COUNTY WATER DISTRICT (CCCWD)
STORM DRAIN	CITY OF MARTINEZ
GAS/ELECTRIC	PACIFIC GAS & ELECTRIC
TRASH	ALLIED WASTE
CABLE/TELEPHONE	COMCAST

13. FLOOD ZONE DESIGNATION: ZONE X PER FEMA FIRM PANEL NUMBER 06013C0277F & 06013C0280F DATED, JUNE 16, 2009.

14. GRADING SHOWN IS PRELIMINARY AND SUBJECT TO CHANGES DURING FINAL DESIGN.

15. ALL PROPOSED UTILITIES SHOWN ARE TENTATIVE AND MAY CHANGE DURING FINAL DESIGN. FINAL DESIGN SHALL ADHERE TO CITY OF MARTINEZ STANDARDS.

16. ALL EXISTING STRUCTURES ARE TO BE REMOVED. ALL EXISTING TREES WITHIN GRADING LIMIT LINE ARE TO BE REMOVED. SEE SHEET 2 & 5 FOR GRADING LIMIT LINE, AND SEE NOTE 2 ON SHEET 5.

17. FOR TREE INFORMATION, SEE REPORT PREPARED BY BAEFSKY & ASSOCIATES, ENVIRONMENTAL LANDSCAPE CONSULTING, DATED OCTOBER 27, 2011.

18. ALL EXISTING ONSITE UTILITIES ARE TO BE REMOVED.

19. NO PROPOSED STRIPING UPGRADES OR PAVEMENT RESTORATION IS PROPOSED FOR MORELLO AVENUE, CENTER AVENUE, AND VINE HILL WAY.

LEGEND:

EXISTING	PROPOSED	DESCRIPTION
		PROPERTY LINE
		LOT LINE
		RIGHT-OF-WAY LINE
		CENTER LINE
		EASEMENT LINE
		TOP OF CURB

ABBREVIATIONS:

AB	AGGREGATE BASE
Ac.	ACRES
AC	ASPHALTIC CONCRETE
CB	CATCH BASIN
CL	CENTERLINE
EL	ELECTROLIER
EX	EXISTING
FC	FACE OF CURB
FH	FIRE HYDRANT
FI	FIELD INLET
FL	FLOWLINE
	GRADE BREAK
	GROUND ELEVATION
	HIGH POINT
	INVERT
	JOINT TRENCH (BY OTHERS)
	LOT LINE
	LOW POINT
	LEFT
	LANDSCAPE
	MAXIMUM
	MINIMUM
	MANHOLE
	PROPERTY LINE
	PUBLIC UTILITY EASEMENT
	RIGHT
	RIGHT OF WAY
	STORM DRAIN
	SQUARE FEET
	SIDE OPENING
	SANITARY SEWER
	SANITARY SEWER EASEMENT
	SIDEWALK
	TOP OF CURB
	TYPICAL
	WATER
	WATER METER

SHEET INDEX

TM-1	SITE PLAN
TM-2	PRELIMINARY GRADING PLAN
TM-3	PRELIMINARY UTILITY PLAN
TM-4	PRELIMINARY STORMWATER CONTROL PLAN
TM-5	PRELIMINARY TREE REMOVAL & DEMOLITION PLAN

PROPOSED LOT SETBACK SUMMARY

CENTER AVENUE	30' TYPICAL (VARIES)
MORELLO AVENUE	75' TYPICAL (VARIES)
VINE HILL WAY	30' TYPICAL (VARIES)
FRONT	20' MINIMUM
SIDE	5' MINIMUM
SIDE (CORNER LOT) ADJACENT TO STREET	15' MINIMUM
REAR	15' MINIMUM

VESTING TENTATIVE MAP
SUBDIVISION 9358
SITE PLAN
VINE HILL

CITY OF MARTINEZ CONTRA COSTA COUNTY CALIFORNIA

0' 60' 180' 240'

SCALE: 1" = 60' DATE: SEPTEMBER 27, 2013

cbg Carlson, Barbee & Gibson, Inc.
CIVIL ENGINEERS - SURVEYORS - PLANNERS
2633 CAMINO RAMON, SUITE 350
SAN RAMON, CALIFORNIA 94583
(925) 866-0322
FAX (925) 866-8575

SHEET NO. TM-1 OF 5 SHEETS

Vine Hill Residential

Figure 2: Project Site Plan

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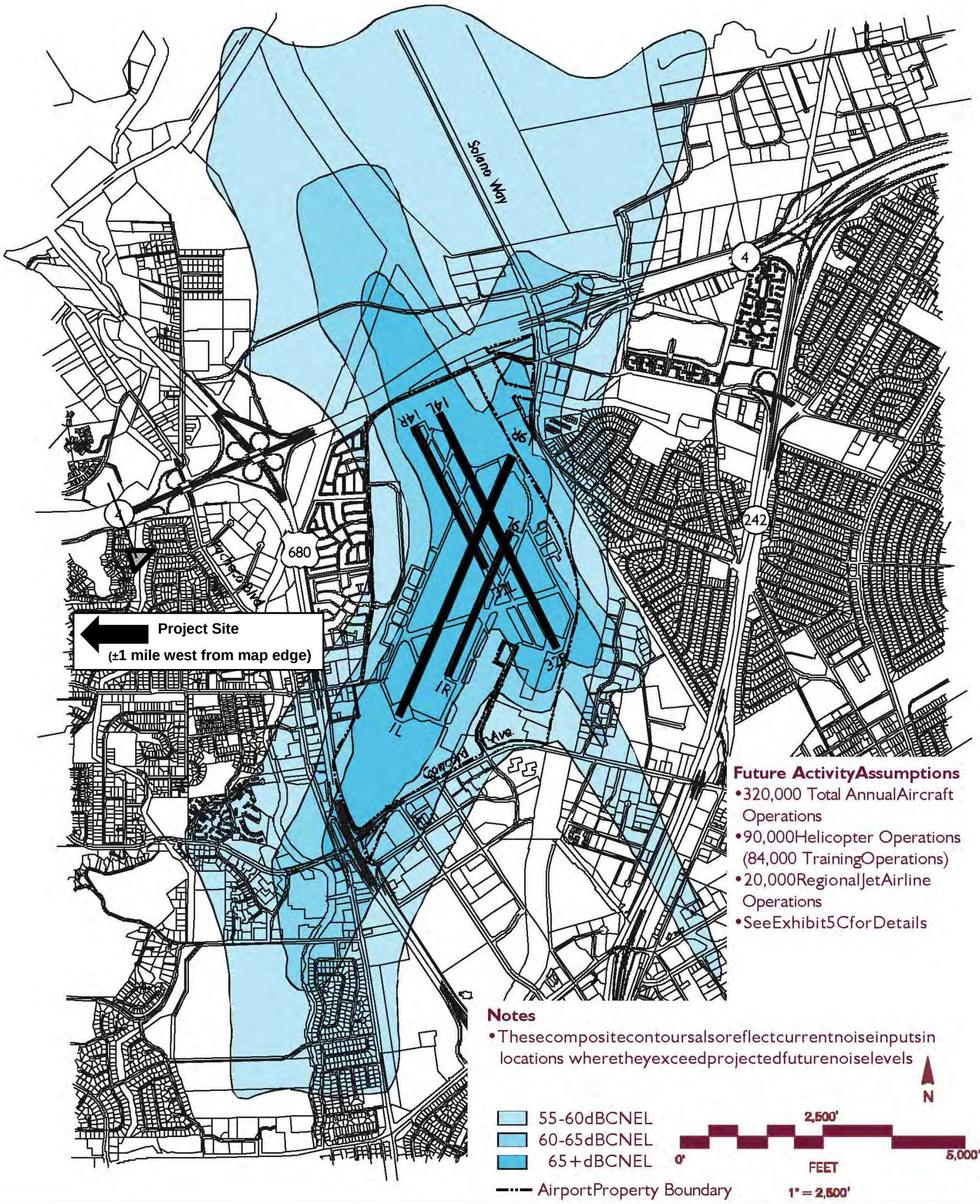

Figure 3: Buchanan Field Noise Contours

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Source: Contra Costa County Airport Land Use Compatibility Plan. December 2000.

Figure Prepared: December 2013

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Appendix B-1

FHWA-RD-77-108 Highway Traffic Noise Prediction Model
Data Input Sheet

Project #: 2013-195 Palmilla Residential
Description: Cumulative Plus Project Traffic
Ldn/CNEL: Ldn
Hard/Soft: Soft

Segment	Roadway Name	Location	ADT	Day %	Eve %	Night %	% Med. Trucks	% Hvy. Trucks	Speed	Distance	Offset (dB)
1	Morello Avenue	Lot 1 Backyard / First Floor Façade	15,060	87		13	1	0.5	25	130	0
1	Morello Avenue	Lot 1 Second Floor Façade	15,060	87		13	1	0.5	25	130	3
2	Center Avenue	Lots 35-47 Backyards / First Floor Façade	2,710	87		13	1	0.5	25	80	0
2	Center Avenue	Lots 35-47 Second Floor Facades	2,710	87		13	1	0.5	25	80	3
3	Vine Hill Way	Lots 24-34 Backyards / First Floor Façade	1,710	87		13	1	0.5	25	75	0
3	Vine Hill Way	Lots 24-34 Second Floor Facades	1,710	87		13	1	0.5	25	75	3

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Appendix B-2

FHWA-RD-77-108 Highway Traffic Noise Prediction Model
Predicted Levels

Project #: 2013-195 Palmilla Residential
Description: Cumulative Plus Project Traffic
Ldn/CNEL: Ldn
Hard/Soft: Soft

Segment	Roadway Name	Location	Autos	Medium Trucks	Heavy Trucks	Total
1	Morello Avenue	Lot 1 Backyard / First Floor Façade	53.9	45.6	50.2	56
1	Morello Avenue	Lot 1 Second Floor Façade	56.9	48.6	53.2	59
2	Center Avenue	Lots 35-47 Backyards / First Floor Fa	49.6	41.3	45.9	52
2	Center Avenue	Lots 35-47 Second Floor Facades	52.6	44.3	48.9	55
3	Vine Hill Way	Lots 24-34 Backyards / First Floor Fa	48.1	39.7	44.4	50
3	Vine Hill Way	Lots 24-34 Second Floor Facades	51.1	42.7	47.4	53

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Appendix B-3

FHWA-RD-77-108 Highway Traffic Noise Prediction Model
Noise Contour Output

Project #: 2013-195 Palmilla Residential
Description: Cumulative Plus Project Traffic
Ldn/CNEL: Ldn
Hard/Soft: Soft

			-------- Distances to Traffic Noise Contours --------				
Segment	Roadway Name	Location	75	70	65	60	55
1	Morello Avenue	Lot 1 Backyard / First Floor Façade	7	15	32	69	149
1	Morello Avenue	Lot 1 Second Floor Façade	11	24	51	110	236
2	Center Avenue	Lots 35-47 Backyards / First Floor Fa	2	5	10	22	47
2	Center Avenue	Lots 35-47 Second Floor Facades	3	8	16	35	75
3	Vine Hill Way	Lots 24-34 Backyards / First Floor Fa	2	3	8	16	35
3	Vine Hill Way	Lots 24-34 Second Floor Facades	3	6	12	26	55

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Appendix A-1
FHWA-RD-77-108 Highway Traffic Noise Prediction Model
Data Input Sheet

Project #: 2013-199 Vine Hill Residential
Description: Existing Traffic
Ldn/CNEL: Ldn
Hard/Soft: Soft

Segment	Roadway Name	Segment Description	ADT	Day %	Eve %	Night %	% Med. Trucks	% Hvy. Trucks	Speed	Distance	Offset (dB)
1	Morello Ave	North of SR-4	21,650	87		13	1.0	0.5	25	60	
2	Morello Ave	North of Muir Rd	15,220	87		13	1.0	0.5	25	60	
3	Morello Ave	Muir Rd to Center Ave	15,010	87		13	1.0	0.5	25	60	
4	Morello Ave	West Project Entrance to Center Ave	#VALUE!	87		#VALUE!	1.0	0.5	25	60	
5	Morello Ave	South of Center Ave	7,480	87		13	1.0	0.5	25	60	
6	Center Ave	West of Morello Ave	3,490	87		13	1.0	0.5	25	60	
7	Center Ave	Morello Ave to Vine Hill Way	2,370	87		13	1.0	0.5	25	60	
8	Center Ave	East of Vine Hill Way	2,670	87		13	1.0	0.5	25	60	
9	Muir Rd	West of Morello Way	6,230	87		13	1.0	0.5	25	60	
10	Muir Rd	East of Morello Way	6,230	87		13	1.0	0.5	25	60	
11	Vine Hill Way	South of Center Ave	2,010	87		13	1.0	0.5	25	60	
12	Vine Hill Way	Center Ave to East Project Entrance	1,340	87		13	1.0	0.5	25	60	
13	Vine Hill Way	North of Project Entrance	#VALUE!	87		#VALUE!	1.0	0.5	25	60	

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Appendix A-2

FHWA-RD-77-108 Highway Traffic Noise Prediction Model

Predicted Levels

Project #: 2013-199 Vine Hill Residential
Description: Existing Traffic
Ldn/CNEL: Ldn
Hard/Soft: Soft

Segment	Roadway Name	Segment Description	Autos	Medium Trucks	Heavy Trucks	Total
1	Morello Ave	North of SR-4	60.5	52.2	56.8	62.5
2	Morello Ave	North of Muir Rd	59.0	50.7	55.3	61.0
3	Morello Ave	Muir Rd to Center Ave	58.9	50.6	55.2	60.9
#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!
5	Morello Ave	South of Center Ave	55.9	47.6	52.2	57.9
6	Center Ave	West of Morello Ave	52.6	44.3	48.9	54.6
7	Center Ave	Morello Ave to Vine Hill Way	50.9	42.6	47.2	52.9
8	Center Ave	East of Vine Hill Way	51.4	43.1	47.7	53.4
9	Muir Rd	West of Morello Way	55.1	46.8	51.4	57.1
10	Muir Rd	East of Morello Way	55.1	46.8	51.4	57.1
11	Vine Hill Way	South of Center Ave	50.2	41.9	46.5	52.2
12	Vine Hill Way	Center Ave to East Project Entrance	48.4	40.1	44.8	50.4
#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!

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Appendix A-3

FHWA-RD-77-108 Highway Traffic Noise Prediction Model

Noise Contour Output

Project #: 2013-199 Vine Hill Residential

Description: Existing Traffic

Ldn/CNEL: Ldn

Hard/Soft: Soft

			-------- Distances to Traffic Noise Contours --------				
Segment	Roadway Name	Segment Description	75	70	65	60	55
1	Morello Ave	North of SR-4	9	19	41	88	190
2	Morello Ave	North of Muir Rd	7	15	32	70	150
3	Morello Ave	Muir Rd to Center Ave	7	15	32	69	149
#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!
5	Morello Ave	South of Center Ave	4	9	20	43	93
6	Center Ave	West of Morello Ave	3	6	12	26	56
7	Center Ave	Morello Ave to Vine Hill Way	2	4	9	20	43
8	Center Ave	East of Vine Hill Way	2	5	10	22	47
9	Muir Rd	West of Morello Way	4	8	18	38	83
10	Muir Rd	East of Morello Way	4	8	18	38	83
11	Vine Hill Way	South of Center Ave	2	4	8	18	39
12	Vine Hill Way	Center Ave to East Project Entrance	1	3	6	14	30
#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!

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Appendix A-4
FHWA-RD-77-108 Highway Traffic Noise Prediction Model
Data Input Sheet

Project #: 2013-199 Vine Hill Residential
Description: Existing + Project Traffic
Ldn/CNEL: Ldn
Hard/Soft: Soft

Segment	Roadway Name	Segment Description	ADT	Day %	Eve %	Night %	% Med. Trucks	% Hvy. Trucks	Speed	Distance	Offset (dB)
1	Morello Ave	North of SR-4	21,750	87		13	1.0	0.5	25	60	
2	Morello Ave	North of Muir Rd	16,920	87		13	1.0	0.5	25	60	
3	Morello Ave	Muir Rd to Center Ave	15,910	87		13	1.0	0.5	25	60	
4	Morello Ave	West Project Entrance to Center Ave	6,980	87		13	1.0	0.5	25	60	
5	Morello Ave	South of Center Ave	7,510	87		13	1.0	0.5	25	60	
6	Center Ave	West of Morello Ave	3,600	87		13	1.0	0.5	25	60	
7	Center Ave	Morello Ave to Vine Hill Way	2,400	87		13	1.0	0.5	25	60	
8	Center Ave	East of Vine Hill Way	2,750	87		13	1.0	0.5	25	60	
9	Muir Rd	West of Morello Way	6,390	87		13	1.0	0.5	25	60	
10	Muir Rd	East of Morello Way	6,360	87		13	1.0	0.5	25	60	
11	Vine Hill Way	South of Center Ave	2,030	87		13	1.0	0.5	25	60	
12	Vine Hill Way	Center Ave to East Project Entrance	1,470	87		13	1.0	0.5	25	60	
13	Vine Hill Way	North of Project Entrance	1,540	87		13	1.0	0.5	25	60	

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Appendix A-5

FHWA-RD-77-108 Highway Traffic Noise Prediction Model

Predicted Levels

Project #: 2013-199 Vine Hill Residential
Description: Existing + Project Traffic
Ldn/CNEL: Ldn
Hard/Soft: Soft

Segment	Roadway Name	Segment Description	Autos	Medium Trucks	Heavy Trucks	Total
1	Morello Ave	North of SR-4	60.6	52.2	56.9	62.5
2	Morello Ave	North of Muir Rd	59.5	51.1	55.8	61.4
3	Morello Ave	Muir Rd to Center Ave	59.2	50.9	55.5	61.2
4	Morello Ave	West Project Entrance to Center Ave	55.6	47.3	51.9	57.6
5	Morello Ave	South of Center Ave	55.9	47.6	52.2	57.9
6	Center Ave	West of Morello Ave	52.7	44.4	49.0	54.7
7	Center Ave	Morello Ave to Vine Hill Way	51.0	42.7	47.3	53.0
8	Center Ave	East of Vine Hill Way	51.6	43.3	47.9	53.5
9	Muir Rd	West of Morello Way	55.2	46.9	51.5	57.2
10	Muir Rd	East of Morello Way	55.2	46.9	51.5	57.2
11	Vine Hill Way	South of Center Ave	50.3	41.9	46.6	52.2
12	Vine Hill Way	Center Ave to East Project Entrance	48.8	40.5	45.2	50.8
13	Vine Hill Way	North of Project Entrance	49.1	40.7	45.4	51.0

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Appendix A-6

FHWA-RD-77-108 Highway Traffic Noise Prediction Model

Noise Contour Output

Project #: 2013-199 Vine Hill Residential

Description: Existing + Project Traffic

Ldn/CNEL: Ldn

Hard/Soft: Soft

			-------- Distances to Traffic Noise Contours --------				
Segment	Roadway Name	Segment Description	75	70	65	60	55
1	Morello Ave	North of SR-4	9	19	41	88	190
2	Morello Ave	North of Muir Rd	7	16	35	75	161
3	Morello Ave	Muir Rd to Center Ave	7	15	33	72	155
4	Morello Ave	West Project Entrance to Center Ave	4	9	19	41	89
5	Morello Ave	South of Center Ave	4	9	20	43	94
6	Center Ave	West of Morello Ave	3	6	12	27	57
7	Center Ave	Morello Ave to Vine Hill Way	2	4	9	20	44
8	Center Ave	East of Vine Hill Way	2	5	10	22	48
9	Muir Rd	West of Morello Way	4	8	18	39	84
10	Muir Rd	East of Morello Way	4	8	18	39	84
11	Vine Hill Way	South of Center Ave	2	4	8	18	39
12	Vine Hill Way	Center Ave to East Project Entrance	1	3	7	15	32
13	Vine Hill Way	North of Project Entrance	2	3	7	15	33

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Appendix A-7
FHWA-RD-77-108 Highway Traffic Noise Prediction Model
Data Input Sheet

Project #: 2013-199 Vine Hill Residential
Description: Background Traffic
Ldn/CNEL: Ldn
Hard/Soft: Soft

Segment	Roadway Name	Segment Description	ADT	Day %	Eve %	Night %	% Med. Trucks	% Hvy. Trucks	Speed	Distance	Offset (dB)
1	Morello Ave	North of SR-4	21,970	87		13	1.0	0.5	25	60	
2	Morello Ave	North of Muir Rd	16,780	87		13	1.0	0.5	25	60	
3	Morello Ave	Muir Rd to Center Ave	15,460	87		13	1.0	0.5	25	60	
4	Morello Ave	West Project Entrance to Center Ave	#VALUE!	87		#VALUE!	1.0	0.5	25	60	
5	Morello Ave	South of Center Ave	7,580	87		13	1.0	0.5	25	60	
6	Center Ave	West of Morello Ave	2,680	87		13	1.0	0.5	25	60	
7	Center Ave	Morello Ave to Vine Hill Way	2,410	87		13	1.0	0.5	25	60	
8	Center Ave	East of Vine Hill Way	2,700	87		13	1.0	0.5	25	60	
9	Muir Rd	West of Morello Way	6,330	87		13	1.0	0.5	25	60	
10	Muir Rd	East of Morello Way	6,330	87		13	1.0	0.5	25	60	
11	Vine Hill Way	South of Center Ave	2,030	87		13	1.0	0.5	25	60	
12	Vine Hill Way	Center Ave to East Project Entrance	1,350	87		13	1.0	0.5	25	60	
13	Vine Hill Way	North of Project Entrance	#VALUE!	87		#VALUE!	1.0	0.5	25	60	

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Appendix A-8

FHWA-RD-77-108 Highway Traffic Noise Prediction Model

Predicted Levels

Project #: 2013-199 Vine Hill Residential
Description: Background Traffic
Ldn/CNEL: Ldn
Hard/Soft: Soft

Segment	Roadway Name	Segment Description	Autos	Medium Trucks	Heavy Trucks	Total
1	Morello Ave	North of SR-4	60.6	52.3	56.9	62.6
2	Morello Ave	North of Muir Rd	59.4	51.1	55.7	61.4
3	Morello Ave	Muir Rd to Center Ave	59.1	50.8	55.4	61.0
#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!
5	Morello Ave	South of Center Ave	56.0	47.7	52.3	57.9
6	Center Ave	West of Morello Ave	51.5	43.1	47.8	53.4
7	Center Ave	Morello Ave to Vine Hill Way	51.0	42.7	47.3	53.0
8	Center Ave	East of Vine Hill Way	51.5	43.2	47.8	53.5
9	Muir Rd	West of Morello Way	55.2	46.9	51.5	57.2
10	Muir Rd	East of Morello Way	55.2	46.9	51.5	57.2
11	Vine Hill Way	South of Center Ave	50.3	41.9	46.6	52.2
12	Vine Hill Way	Center Ave to East Project Entrance	48.5	40.2	44.8	50.5
#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!

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Appendix A-9

FHWA-RD-77-108 Highway Traffic Noise Prediction Model

Noise Contour Output

Project #: 2013-199 Vine Hill Residential

Description: Background Traffic

Ldn/CNEL: Ldn

Hard/Soft: Soft

			-------- Distances to Traffic Noise Contours --------				
Segment	Roadway Name	Segment Description	75	70	65	60	55
1	Morello Ave	North of SR-4	9	19	41	89	192
2	Morello Ave	North of Muir Rd	7	16	35	74	160
3	Morello Ave	Muir Rd to Center Ave	7	15	33	70	152
#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!
5	Morello Ave	South of Center Ave	4	9	20	44	94
6	Center Ave	West of Morello Ave	2	5	10	22	47
7	Center Ave	Morello Ave to Vine Hill Way	2	4	9	20	44
8	Center Ave	East of Vine Hill Way	2	5	10	22	47
9	Muir Rd	West of Morello Way	4	8	18	39	84
10	Muir Rd	East of Morello Way	4	8	18	39	84
11	Vine Hill Way	South of Center Ave	2	4	8	18	39
12	Vine Hill Way	Center Ave to East Project Entrance	1	3	6	14	30
#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!

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Appendix A-10
FHWA-RD-77-108 Highway Traffic Noise Prediction Model
Data Input Sheet

Project #: 2013-199 Vine Hill Residential
Description: Background + Project Traffic
Ldn/CNEL: Ldn
Hard/Soft: Soft

Segment	Roadway Name	Segment Description	ADT	Day %	Eve %	Night %	% Med. Trucks	% Hvy. Trucks	Speed	Distance	Offset (dB)
1	Morello Ave	North of SR-4	22,070	87		13	1.0	0.5	25	60	
2	Morello Ave	North of Muir Rd	17,180	87		13	1.0	0.5	25	60	
3	Morello Ave	Muir Rd to Center Ave	16,150	87		13	1.0	0.5	25	60	
4	Morello Ave	West Project Entrance to Center Ave	7,090	87		13	1.0	0.5	25	60	
5	Morello Ave	South of Center Ave	7,610	87		13	1.0	0.5	25	60	
6	Center Ave	West of Morello Ave	3,650	87		13	1.0	0.5	25	60	
7	Center Ave	Morello Ave to Vine Hill Way	2,440	87		13	1.0	0.5	25	60	
8	Center Ave	East of Vine Hill Way	2,780	87		13	1.0	0.5	25	60	
9	Muir Rd	West of Morello Way	6,490	87		13	1.0	0.5	25	60	
10	Muir Rd	East of Morello Way	6,460	87		13	1.0	0.5	25	60	
11	Vine Hill Way	South of Center Ave	2,050	87		13	1.0	0.5	25	60	
12	Vine Hill Way	Center Ave to East Project Entrance	1,480	87		13	1.0	0.5	25	60	
13	Vine Hill Way	North of Project Entrance	1,430	87		13	1.0	0.5	25	60	

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Appendix A-11

FHWA-RD-77-108 Highway Traffic Noise Prediction Model

Predicted Levels

Project #: 2013-199 Vine Hill Residential
Description: Background + Project Traffic
Ldn/CNEL: Ldn
Hard/Soft: Soft

Segment	Roadway Name	Segment Description	Autos	Medium Trucks	Heavy Trucks	Total
1	Morello Ave	North of SR-4	60.6	52.3	56.9	62.6
2	Morello Ave	North of Muir Rd	59.5	51.2	55.8	61.5
3	Morello Ave	Muir Rd to Center Ave	59.3	50.9	55.6	61.2
4	Morello Ave	West Project Entrance to Center Ave	55.7	47.4	52.0	57.7
5	Morello Ave	South of Center Ave	56.0	47.7	52.3	58.0
6	Center Ave	West of Morello Ave	52.8	44.5	49.1	54.8
7	Center Ave	Morello Ave to Vine Hill Way	51.1	42.7	47.4	53.0
8	Center Ave	East of Vine Hill Way	51.6	43.3	47.9	53.6
9	Muir Rd	West of Morello Way	55.3	47.0	51.6	57.3
10	Muir Rd	East of Morello Way	55.3	47.0	51.6	57.3
11	Vine Hill Way	South of Center Ave	50.3	42.0	46.6	52.3
12	Vine Hill Way	Center Ave to East Project Entrance	48.9	40.6	45.2	50.9
13	Vine Hill Way	North of Project Entrance	48.7	40.4	45.0	50.7

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Appendix A-12

FHWA-RD-77-108 Highway Traffic Noise Prediction Model

Noise Contour Output

Project #: 2013-199 Vine Hill Residential

Description: Background + Project Traffic

Ldn/CNEL: Ldn

Hard/Soft: Soft

			-------- Distances to Traffic Noise Contours --------				
Segment	Roadway Name	Segment Description	75	70	65	60	55
1	Morello Ave	North of SR-4	9	19	41	89	192
2	Morello Ave	North of Muir Rd	8	16	35	76	163
3	Morello Ave	Muir Rd to Center Ave	7	16	34	72	156
4	Morello Ave	West Project Entrance to Center Ave	4	9	19	42	90
5	Morello Ave	South of Center Ave	4	9	20	44	95
6	Center Ave	West of Morello Ave	3	6	12	27	58
7	Center Ave	Morello Ave to Vine Hill Way	2	4	10	21	44
8	Center Ave	East of Vine Hill Way	2	5	10	22	48
9	Muir Rd	West of Morello Way	4	9	18	39	85
10	Muir Rd	East of Morello Way	4	8	18	39	85
11	Vine Hill Way	South of Center Ave	2	4	8	18	39
12	Vine Hill Way	Center Ave to East Project Entrance	1	3	7	15	32
13	Vine Hill Way	North of Project Entrance	1	3	7	14	31

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Appendix A-13
FHWA-RD-77-108 Highway Traffic Noise Prediction Model
Data Input Sheet

Project #: 2013-199 Vine Hill Residential
Description: Cumulative Traffic
Ldn/CNEL: Ldn
Hard/Soft: Soft

Segment	Roadway Name	Segment Description	ADT	Day %	Eve %	Night %	% Med. Trucks	% Hvy. Trucks	Speed	Distance	Offset (dB)
1	Morello Ave	North of SR-4	24,390	87		13	1.0	0.5	25	60	
2	Morello Ave	North of Muir Rd	18,630	87		13	1.0	0.5	25	60	
3	Morello Ave	Muir Rd to Center Ave	14,500	87		13	1.0	0.5	25	60	
4	Morello Ave	West Project Entrance to Center Ave	#VALUE!	87		#VALUE!	1.0	0.5	25	60	
5	Morello Ave	South of Center Ave	8,420	87		13	1.0	0.5	25	60	
6	Center Ave	West of Morello Ave	3,930	87		13	1.0	0.5	25	60	
7	Center Ave	Morello Ave to Vine Hill Way	2,680	87		13	1.0	0.5	25	60	
8	Center Ave	East of Vine Hill Way	2,990	87		13	1.0	0.5	25	60	
9	Muir Rd	West of Morello Way	7,030	87		13	1.0	0.5	25	60	
10	Muir Rd	East of Morello Way	7,030	87		13	1.0	0.5	25	60	
11	Vine Hill Way	South of Center Ave	2,250	87		13	1.0	0.5	25	60	
12	Vine Hill Way	Center Ave to East Project Entrance	1,490	87		13	1.0	0.5	25	60	
13	Vine Hill Way	North of Project Entrance	#VALUE!	87		#VALUE!	1.0	0.5	25	60	

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Appendix A-14

FHWA-RD-77-108 Highway Traffic Noise Prediction Model

Predicted Levels

Project #: 2013-199 Vine Hill Residential
Description: Cumulative Traffic
Ldn/CNEL: Ldn
Hard/Soft: Soft

Segment	Roadway Name	Segment Description	Autos	Medium Trucks	Heavy Trucks	Total
1	Morello Ave	North of SR-4	61.0	52.7	57.4	63.0
2	Morello Ave	North of Muir Rd	59.9	51.6	56.2	61.9
3	Morello Ave	Muir Rd to Center Ave	58.8	50.5	55.1	60.8
#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!
5	Morello Ave	South of Center Ave	56.4	48.1	52.7	58.4
6	Center Ave	West of Morello Ave	53.1	44.8	49.4	55.1
7	Center Ave	Morello Ave to Vine Hill Way	51.5	43.1	47.8	53.4
8	Center Ave	East of Vine Hill Way	51.9	43.6	48.2	53.9
9	Muir Rd	West of Morello Way	55.6	47.3	52.0	57.6
10	Muir Rd	East of Morello Way	55.6	47.3	52.0	57.6
11	Vine Hill Way	South of Center Ave	50.7	42.4	47.0	52.7
12	Vine Hill Way	Center Ave to East Project Entrance	48.9	40.6	45.2	50.9
#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!

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Appendix A-15

FHWA-RD-77-108 Highway Traffic Noise Prediction Model

Noise Contour Output

Project #: 2013-199 Vine Hill Residential

Description: Cumulative Traffic

Ldn/CNEL: Ldn

Hard/Soft: Soft

			-------- Distances to Traffic Noise Contours --------				
Segment	Roadway Name	Segment Description	75	70	65	60	55
1	Morello Ave	North of SR-4	10	21	44	95	206
2	Morello Ave	North of Muir Rd	8	17	37	80	172
3	Morello Ave	Muir Rd to Center Ave	7	15	31	67	145
#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!
5	Morello Ave	South of Center Ave	5	10	22	47	101
6	Center Ave	West of Morello Ave	3	6	13	28	61
7	Center Ave	Morello Ave to Vine Hill Way	2	5	10	22	47
8	Center Ave	East of Vine Hill Way	2	5	11	24	51
9	Muir Rd	West of Morello Way	4	9	19	42	90
10	Muir Rd	East of Morello Way	4	9	19	42	90
11	Vine Hill Way	South of Center Ave	2	4	9	19	42
12	Vine Hill Way	Center Ave to East Project Entrance	1	3	7	15	32
#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!

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Appendix A-16
FHWA-RD-77-108 Highway Traffic Noise Prediction Model
Data Input Sheet

Project #: 2013-199 Vine Hill Residential
Description: Cumulative + Project Traffic
Ldn/CNEL: Ldn
Hard/Soft: Soft

Segment	Roadway Name	Segment Description	ADT	Day %	Eve %	Night %	% Med. Trucks	% Hvy. Trucks	Speed	Distance	Offset (dB)
1	Morello Ave	North of SR-4	24,490	87		13	1.0	0.5	25	60	
2	Morello Ave	North of Muir Rd	19,300	87		13	1.0	0.5	25	60	
3	Morello Ave	Muir Rd to Center Ave	15,060	87		13	1.0	0.5	25	60	
4	Morello Ave	West Project Entrance to Center Ave	7,870	87		13	1.0	0.5	25	60	
5	Morello Ave	South of Center Ave	8,450	87		13	1.0	0.5	25	60	
6	Center Ave	West of Morello Ave	4,040	87		13	1.0	0.5	25	60	
7	Center Ave	Morello Ave to Vine Hill Way	2,710	87		13	1.0	0.5	25	60	
8	Center Ave	East of Vine Hill Way	3,070	87		13	1.0	0.5	25	60	
9	Muir Rd	West of Morello Way	7,190	87		13	1.0	0.5	25	60	
10	Muir Rd	East of Morello Way	7,160	87		13	1.0	0.5	25	60	
11	Vine Hill Way	South of Center Ave	2,270	87		13	1.0	0.5	25	60	
12	Vine Hill Way	Center Ave to East Project Entrance	1,620	87		13	1.0	0.5	25	60	
13	Vine Hill Way	North of Project Entrance	1,710	87		13	1.0	0.5	25	60	

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Appendix A-17

FHWA-RD-77-108 Highway Traffic Noise Prediction Model

Predicted Levels

Project #: 2013-199 Vine Hill Residential
Description: Cumulative + Project Traffic
Ldn/CNEL: Ldn
Hard/Soft: Soft

Segment	Roadway Name	Segment Description	Autos	Medium Trucks	Heavy Trucks	Total
1	Morello Ave	North of SR-4	61.1	52.8	57.4	63.0
2	Morello Ave	North of Muir Rd	60.0	51.7	56.3	62.0
3	Morello Ave	Muir Rd to Center Ave	59.0	50.6	55.3	60.9
4	Morello Ave	West Project Entrance to Center Ave	56.1	47.8	52.4	58.1
5	Morello Ave	South of Center Ave	56.4	48.1	52.8	58.4
6	Center Ave	West of Morello Ave	53.2	44.9	49.5	55.2
7	Center Ave	Morello Ave to Vine Hill Way	51.5	43.2	47.8	53.5
8	Center Ave	East of Vine Hill Way	52.0	43.7	48.4	54.0
9	Muir Rd	West of Morello Way	55.7	47.4	52.0	57.7
10	Muir Rd	East of Morello Way	55.7	47.4	52.0	57.7
11	Vine Hill Way	South of Center Ave	50.7	42.4	47.0	52.7
12	Vine Hill Way	Center Ave to East Project Entrance	49.3	41.0	45.6	51.2
13	Vine Hill Way	North of Project Entrance	49.5	41.2	45.8	51.5

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Appendix A-18

FHWA-RD-77-108 Highway Traffic Noise Prediction Model

Noise Contour Output

Project #: 2013-199 Vine Hill Residential

Description: Cumulative + Project Traffic

Ldn/CNEL: Ldn

Hard/Soft: Soft

			-------- Distances to Traffic Noise Contours --------				
Segment	Roadway Name	Segment Description	75	70	65	60	55
1	Morello Ave	North of SR-4	10	21	44	96	206
2	Morello Ave	North of Muir Rd	8	18	38	82	176
3	Morello Ave	Muir Rd to Center Ave	7	15	32	69	149
4	Morello Ave	West Project Entrance to Center Ave	4	10	21	45	97
5	Morello Ave	South of Center Ave	5	10	22	47	101
6	Center Ave	West of Morello Ave	3	6	13	29	62
7	Center Ave	Morello Ave to Vine Hill Way	2	5	10	22	47
8	Center Ave	East of Vine Hill Way	2	5	11	24	52
9	Muir Rd	West of Morello Way	4	9	20	42	91
10	Muir Rd	East of Morello Way	4	9	20	42	91
11	Vine Hill Way	South of Center Ave	2	4	9	20	42
12	Vine Hill Way	Center Ave to East Project Entrance	2	3	7	16	34
13	Vine Hill Way	North of Project Entrance	2	3	8	16	35

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