

NOISE ASSESSMENT

FOR

**BETTERAVIA CAR WASH
SANTA MARIA, CA**

NOVEMBER 2022

PREPARED BY:



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INTRODUCTION

This report provides an analysis of noise impacts associated with the proposed car wash project (project) located adjacent to and north of Betteravia Road between Blosser Road and Broadway. The car wash proposes to place self-serve automotive vacuum stations along the northern perimeter of the project site. Dual wash bays are proposed with the bay exits oriented northward. This report also provides a summary of existing conditions in the project area and applicable noise standards. The proposed project location and site plan are depicted in Figures 1 and 2.

ACOUSTIC FUNDAMENTALS

Noise is generally defined as sound that is loud, disagreeable, or unexpected. Sound, as described in more detail below, is mechanical energy transmitted in the form of a wave because of a disturbance or vibration.

AMPLITUDE

Amplitude is the difference between ambient air pressure and the peak pressure of the sound wave. Amplitude is measured in decibels (dB) on a logarithmic scale as discussed below. Amplitude is interpreted by the ear as corresponding to different degrees of loudness. Laboratory measurements have determined that a 10 dB increase in amplitude correlates with a perceived doubling of loudness and a 3 dB change in amplitude is the minimum audible difference perceptible to the average person.

FREQUENCY

Frequency is the number of fluctuations of the pressure wave per second. The unit of frequency is the Hertz (Hz). One Hz equals one cycle per second. The human ear is not equally sensitive to sound of different frequencies. Sound waves below 16 Hz or above 20,000 Hz cannot be heard at all, and the ear is more sensitive to sound in the higher portion of this range than in the lower. To approximate this sensitivity, environmental sound is usually measured in A-weighted decibels (dBA). On this scale, the normal range of human hearing extends from about 10 dBA to about 140 dBA. Common community noise sources and associated noise levels, in dBA, are depicted in Figure 3.

ADDITION OF DECIBELS

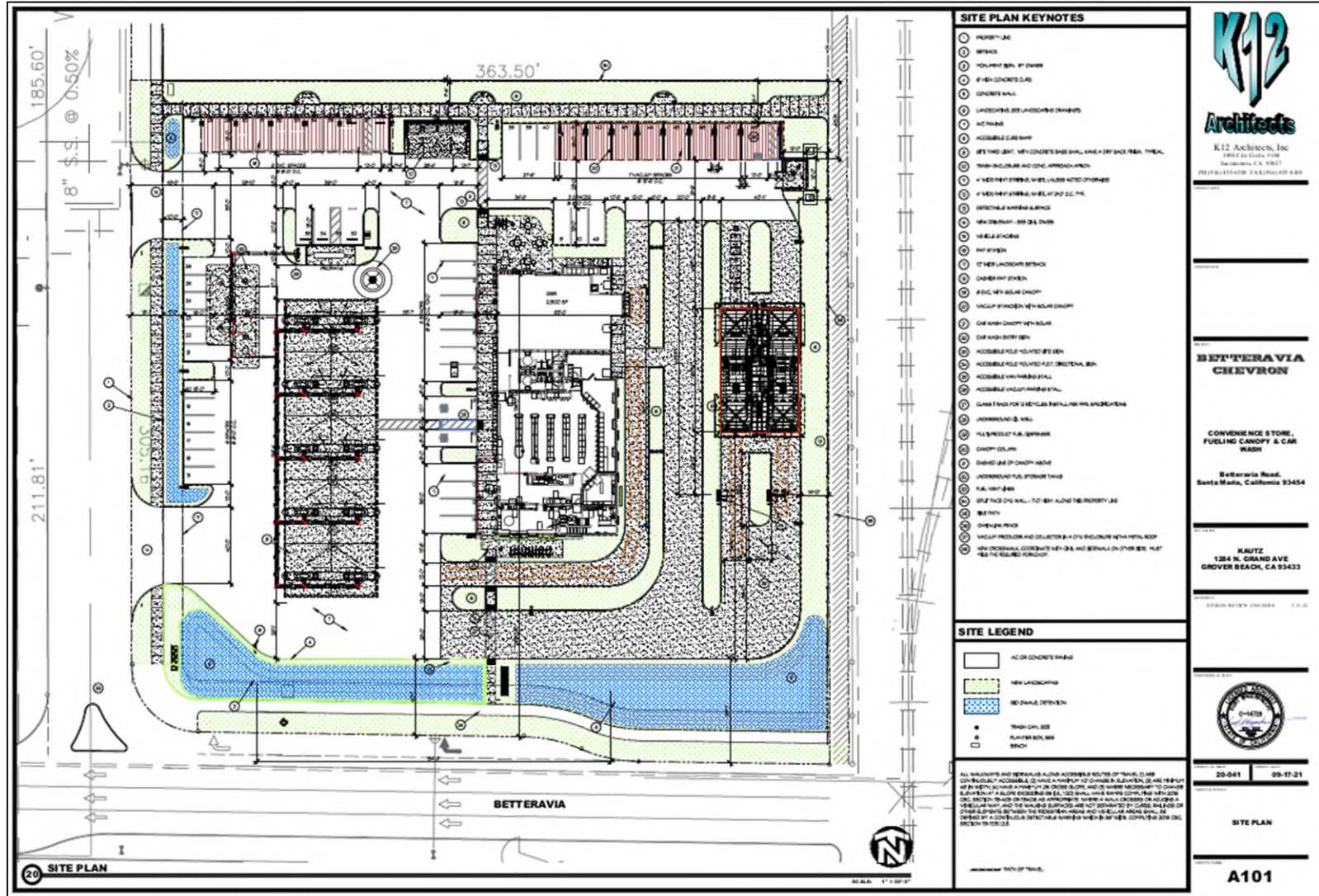
Because decibels are logarithmic units, sound levels cannot be added or subtracted through ordinary arithmetic. Under the decibel scale, a doubling of sound energy corresponds to a 3-dB increase. In other words, when two identical sources are each producing sound of the same loudness, the resulting sound level at a given distance would be 3 dB higher than one source under the same conditions. For example, if one automobile produces a sound level of 70 dB when it passes an observer, two cars passing simultaneously would not produce 140 dB; rather, they would combine to produce 73 dB. Under the decibel scale, three sources of equal loudness together would produce an increase of 5 dB.

FIGURE 1. PROPOSED CAR WASH LOCATION AND NOISE MEASUREMENT LOCATIONS



Note: Not to Scale

FIGURE 2. PROPOSED CAR WASH LAYOUT



Note: Not to Scale

FIGURE 3. TYPICAL COMMUNITY NOISE LEVELS

Common Outdoor Activities	Noise Level (dBA)	Common Indoor Activities
<u>Jet Fly-over at 300m (1000 ft)</u>	110	<u>Rock Band</u>
<u>Gas Lawn Mower at 1 m (3 ft)</u>	100	
<u>Diesel Truck at 15 m (50 ft), at 80 km (50 mph)</u>	90	<u>Food Blender at 1 m (3 ft)</u>
<u>Noisy Urban Area, Daytime</u>	80	<u>Garbage Disposal at 1 m (3 ft)</u>
<u>Gas Lawn Mower, 30 m (100 ft)</u>	70	<u>Vacuum Cleaner at 3 m (10 ft)</u>
<u>Commercial Area</u>		<u>Normal Speech at 1 m (3 ft)</u>
<u>Heavy Traffic at 90 m (300 ft)</u>	60	
<u>Quiet Urban Daytime</u>	50	<u>Large Business Office</u>
		<u>Dishwasher Next Room</u>
<u>Quiet Urban Nighttime</u>	40	<u>Theater, Large Conference Room (Background)</u>
<u>Quiet Suburban Nighttime</u>		<u>Library</u>
<u>Quiet Rural Nighttime</u>	30	<u>Bedroom at Night,</u>
		<u>Concert Hall (Background)</u>
	20	<u>Broadcast/Recording Studio</u>
	10	
<u>Lowest Threshold of Human Hearing</u>	0	<u>Lowest Threshold of Human Hearing</u>

Source: Caltrans 2021

SOUND PROPAGATION & ATTENUATION

Geometric Spreading

Sound from a localized source (i.e., a point source) propagates uniformly outward in a spherical pattern. The sound level decreases (attenuates) at a rate of approximately 6 dB for each doubling of distance from a point source. Highways consist of several localized noise sources on a defined path, and hence can be treated as a line source, which approximates the effect of several point sources. Noise from a line source propagates outward in a cylindrical pattern, often referred to as cylindrical spreading. Sound levels attenuate at a rate of approximately 3 dB for each doubling of distance from a line source, depending on ground surface characteristics. For acoustically hard sites (i.e., sites with a reflective surface between the source and the receiver, such as a parking lot or body of water,), no excess ground attenuation is assumed. For acoustically absorptive or soft sites (i.e., those sites with an absorptive ground surface between a line source and the receiver, such as soft dirt, grass, or scattered bushes and trees), an excess ground-attenuation value of 1.5 dB per doubling of distance is normally assumed. When added to the cylindrical spreading, the excess ground attenuation for soft surfaces results in an overall attenuation rate of 4.5 dB per doubling of distance from a line source.

Shielding by Natural or Human-Made Features

A large object or barrier in the path between a noise source and a receiver can substantially attenuate noise levels at the receiver. The amount of attenuation provided by shielding depends on the size of the object and the frequency content of the noise source. Natural terrain features (e.g., hills and dense woods) and human-made features (e.g., buildings and walls) can substantially reduce noise levels. Walls are often constructed between a source and a receiver specifically to reduce noise. A barrier that breaks the line of sight between a source and a receiver will typically result in an approximate 5 dB of noise reduction. Taller barriers provide increased noise reduction. Intervening buildings can reduce noise levels by as much as approximately 15 dB.

NOISE DESCRIPTORS

The decibel scale alone does not adequately characterize how humans perceive noise. The dominant frequencies of a sound have a substantial effect on the human response to that sound. Although the intensity (energy per unit area) of the sound is a purely physical quantity, the loudness or human response is determined by the characteristics of the human ear.

Human hearing is limited in the range of audible frequencies as well as in the way it perceives the sound-pressure level in that range. In general, people are most sensitive to the frequency range of 1,000 to 8,000 Hz, and perceive sounds within that range better than sounds of the same amplitude in higher or lower frequencies. To approximate the response of the human ear, sound levels of individual frequency bands are weighted, depending on the human sensitivity to those frequencies, which is referred to as the "A-weighted" sound level (expressed in units of dBA). The A-weighting network approximates the frequency response of the average young ear when listening to most ordinary sounds. When people make judgments of the relative loudness or annoyance of a sound, their judgments correlate well with the A-weighted noise scale. Other weighting networks have been devised to address high noise levels or other special problems (e.g., B-, C-, and D-scales), but these scales are rarely used in conjunction with environmental noise. In addition, the intensity of environmental noise fluctuates over time, and several descriptors of time-averaged noise levels are typically used. Common noise descriptors used in this analysis are summarized in Table 1.

TABLE 1. COMMON ACOUSTICAL TERMS AND DESCRIPTORS

Descriptor	Definition
Decibel (dB)	A unit-less measure of sound on a logarithmic scale, which indicates the squared ratio of sound pressure amplitude to referenced sound pressure amplitude. The reference pressure is 20 micro-pascals.
A-Weighted Decibel (dBA)	An overall frequency-weighted sound level in decibels that approximates the frequency response of the human ear.
Energy Equivalent Noise Level (L_{eq})	The energy mean (average) noise level. The instantaneous noise levels during a specific period of time in dBA are converted to relative energy values. From the sum of the relative energy values, an average energy value (in dBA) is calculated.
Statistical Noise Level L_n	The statistical descriptor where the noise level is exceeded for n% of the time during the measurement period.
Maximum Noise Level (L_{max})	The maximum instantaneous noise level during a specific period of time.

REGULATORY FRAMEWORK

CITY OF SANTA MARIA GENERAL PLAN NOISE ELEMENT

The City of Santa Maria's General Plan establishes noise standards for the purpose of protecting noise-sensitive uses from excessive noise either through noise-reducing project design features or by allowing noise sensitive land uses to only locate in areas with ambient noise levels below specific thresholds. Applicable goals and policies related to the proposed project are summarized below (City of Santa Maria 1997):

Goal N.1. To protect present and future Santa Maria residents and workers from the harmful and annoying effects of exposure to excessive noise levels.

Policy N.1.a. Overall Noise Control in Santa Maria:

Protect and enhance the quality of the City's noise environment by controlling noise at its source, along its transmission paths, and at the site of the ultimate receiver.

Policy N.1.b. Location of New Noise Generators:

Regulate the placement and construction of new noise generators, to avoid excessive interior and exterior noise level impacts on adjacent noise sensitive properties; and of new noise receptors (such as housing and schools), to minimize the negative effects of local noise generation.

Policy N.1.c. Noise Control with the Required Environmental Planning and Regulatory Process:

Control Harmful or undesirable noise through the environmental planning and regulatory process with emphasis on noise/land use compatibility planning.

Policy N.1.d. Explore New Measures to Address Existing and Future Transportation Noise:

Explore possible strategies to control vehicular noise generation that would reduce noise impacts on exiting noise-sensitive land uses (residential and schools) located within the 60+ dB CNEL contour.

CITY OF SANTA MARIA NOISE CONTROL ORDINANCE

The intent of the City of Santa Maria Noise Regulation Ordinance (Title 5, Chapter 5-5) is to establish acceptable standards for, and describe how to measure, daytime and nighttime noise levels. Implementation of these standards helps protect public health, welfare, and safety from excessive and detrimental noise levels (City of Santa Maria 2021).

Section 5-5.01. Policy Declared

- A. It is declared to be the policy of the City to prohibit unnecessary, excessive, and annoying noises from all sources subject to its police power. Noises detrimental to the health and welfare of the citizenry shall be systematically proscribed.

- B. It shall also be the policy of the City to prohibit noises that constitute a nuisance regardless of level during certain time periods. (Prior Code § 10-91A.1)

Section 5-5.03. Complaint Evaluation

A complaint shall be evaluated in the following manner:

- A. An ambient reading shall be made at a time when the offending noise source is not present. A sample of no less than one (1) hour shall be taken.
- B. Noise reading shall be made concurrent with the offending noise. A sample of no less than one (1) hour shall be taken. The offending noise shall be considered the L_{eq} or L_{10} as set forth in Section 5-5.02.
- C. These readings shall be made at precisely the same location, which shall be at the property line of the complaining party. (Prior Code § 10-91A.3)

Section 5-5.04. Determination of Violation

- A. A violation shall be determined to exist when the noise level exceeds the ambient noise level or the ambient base noise level, whichever is higher, as follows
 - 1. By any amount thirty (30) minutes for any given hour, measured cumulatively;
 - 2. By five (5) dB(A), fifteen (15) minutes for any given hour;
 - 3. By ten (10) dB(A), five (5) minutes for any given hour;
 - 4. By twenty (20) dB(A) at any time.
- B. Where one (1) zone interfaces with another, the ambient noise base level prescribed for the most restrictive zones shall prevail.

Section 5-5.05. Ambient Base Noise Level

The City defines "daytime" as the period of time between sunrise and sunset while "nighttime" is defined as the period of time between sunset and sunrise. The ambient base noise level is established as follows:

TABLE 2. AMBIENT BASE NOISE LEVEL

Zone	Noise Level (dBA)							
	Ambient Base		15-Minute Duration		5-Minute Duration		1-Minute Duration	
	Day	Night	Day	Night	Day	Night	Day	Night
Residential	55	45	60	50	65	55	70	60
Commercial	65	60	70	65	75	70	80	75
Industrial	75	70	80	75	85	80	90	85

*Ambient base noise level is defined as the reasonable and representative ambient noise levels in various land use categories.
Source: City of Santa Maria 2021*

Noise levels are expressed using the A-weighted scale of dBA. The City's noise ordinance limits are stated in terms of hourly equivalent sound level (L_{eq}), except when the L_{10} exceeds the L_{eq} by 5 dBA, or more. Although not stated in the City's noise ordinance, the City's General Plan defines daytime as 7 a.m. to 10 p.m. and nighttime as 10:00 p.m. to 7 a.m.

AMBIENT NOISE ENVIRONMENT

NOISE-SENSITIVE RECEPTORS

Noise-sensitive receptors in the project area consist predominantly of residential dwellings located north of the project site (refer to Figure 1). The nearest receptor is located at the property line of the proposed car wash and the land use to the north. The nearest existing outdoor activity area is located approximately 1,000 feet north of the proposed car wash.

AMBIENT NOISE LEVELS

The noise environment in the proposed project area is defined primarily by vehicular traffic on Betteravia Road. To a lesser extent, activities at nearby commercial land uses and the nearby railroad track also contributes to ambient noise levels in the project area.

To document existing ambient noise levels at the project site, short-term ambient noise measurements were conducted on March 3rd, 2022. Noise measurements were conducted using a Larson Davis Laboratories, Type I, Model LxT sound-level meter positioned at a height of approximately 5 feet above ground level. Noise measurement equipment was calibrated prior to and upon completion of the noise measurement survey. Noise measurement locations are depicted in Figure 1. Measured ambient noise levels are summarized in Table 3.

As depicted in Table 3, average ambient noise levels in the area around the project site ranged from approximately 42 to 69 dBA L_{eq} . Noise levels at these locations were influenced primarily by vehicle traffic on Betteravia Road. To a lesser extent, occasional vehicle operations in the nearby parking lots and commercial activities at nearby land uses also contribute to ambient noise conditions at this location. As a result, the proposed project's exterior compliance standard at this location is based on the City's standard. Measured exterior noise levels during the proposed car wash operational hours (daytime) in comparison to the City's corresponding noise standards are summarized in Table 6.

TABLE 3. SUMMARY OF SHORT-TERM MEASURED AMBIENT EXTERIOR NOISE LEVELS

Location	Location Description	Monitoring Period	Noise Levels (L_{eq} dBA)
1	Approximately 85 feet south of Pergola Street and 105 feet west of adjacent train tracks.	11:36 – 11:46	42.3
2	Approximately 45 feet north of Betteravia Road right-of-way and 65 feet west of adjacent train tracks.	12:14 – 12:24	67.3
3	Adjacent to west side sidewalk on Oakley Avenue, approximately 92 feet south of Betteravia Road.	12:31 – 12:41	68.9

Ambient noise measurements were conducted using a Larson Davis Laboratories, Type I, LxT integrating sound-level meter placed at a height of approximately 5 feet above ground level. Equipment was calibrated prior to and upon completion of the noise measurements. Refer to Figure 1 for noise measurement locations.

NOISE ASSESSMENT

METHODOLOGY

The highest noise levels associated with car wash operations are typically associated with the operation of the dryer motors. The proposed car wash has been designed to include the use of an AquaDri on-board dryer system from Mark VII Equipment. Based on provided information from the project proponent, the AquaDri system with the highest noise level was used. Operational noise levels for the dryers were based on manufacturer's specifications of 96 dBA at 10 feet from the source. Manufacturer data is included in Appendix A. Additionally, the noise produced from the vacuum area located near the northern property line was also included in the analysis. Representative noise data for the vacuum nozzles and motor were based on representative noise measurement data obtained from a similar car wash. The proposed centralized vacuum motor would be located within an enclosed masonry-block structure, which is generally located to the east of the vacuum stations. Based on representative noise measurement data for similar centralized vacuum systems, an operational noise level of 57 dBA L_{eq} at 25 feet was assumed.

Noise levels associated with the operation of the proposed car wash were calculated using the SoundPlan v8.2 computer model. Predicted operational noise levels were calculated at the nearest adjacent northern property line, as well as nearby proposed residential land uses, based on the proposed site plan derived from the Betteravia Plaza General Plan Amendment Land Use and Zone Change Development Agreement Draft Environmental Impact Report (City of Santa Maria 2015). It is important to note that the duration of the wash and dry cycles can vary. Based on noise surveys conducted at similar car wash operations, cycle durations

generally range from approximately 1 minute for the dry cycle to approximately 2-3 minutes for the wash cycle. This analysis assumed a total of 10 dry and wash cycles per hour per bay, which is the estimated maximum throughput based on average wash/dry cycle times. To be conservative, operation of the vacuums was assumed to be concurrent with car wash operations. Noise prediction locations, the proposed car wash location, and nearby proposed land uses are depicted in Figure 4.

Predicted operational noise levels were compared to City of Santa Maria's noise standards for the determination of potential noise impacts. This analysis was based on the City's minimum acceptable daytime/nighttime noise standards of 55 and 45 dBA L_{eq} , respectively, for residential land uses (refer to Table 2). Mitigation measures were recommended for locations predicted to exceed the City's noise standards.

PREDICTED NOISE LEVELS WITHOUT RECOMMENDED NOISE-REDUCTION MEASURES

Predicted operational noise levels at the northern property line, located approximately 120 feet to the north of the proposed car wash, and nearby planned land uses north of the project site are summarized in Table 4. Modeled receptor locations and corresponding predicted highest average-hourly noise levels (in dBA L_{eq}) at these receptors are depicted in Figure 4.

As depicted in Table 4, the highest predicted operational noise levels at modeled receptor locations, without incorporation of recommended noise-reduction measures, would range from approximately 66 dBA L_{eq} to 48 dBA L_{eq} . Predicted operational noise levels at receptors R1 and R2 located immediately north of the project would exceed the City's daytime and nighttime noise standard. Receptors R3 and R4 are predicted to exceed the City's nighttime noise standard.

TABLE 4. PREDICTED OPERATIONAL NOISE LEVELS AT NEARBY RECEPTORS – WITHOUT NOISE REDUCTION MEASURES

Receptor Location	Predicted Noise Level at Receptor (dBA L_{eq}) ^{1,3}	Daytime/Nighttime Noise Standard ² (dBA L_{eq})	Exceeds Daytime/Nighttime Noise Standard?
R1 – Lot 4/Lot 5 Property Line	66.4	55/45	Yes/Yes
R2 – Lot 4	57.6	55/45	Yes/Yes
R3 – Lot 3/Lot 4 Property Line	49.3	55/45	No/Yes
R4 – Lot 3	48.3	55/45	No/Yes
R5 – Lot 5 Outdoor Eating Area	51.7	65/60	No/No

1. Predicted noise levels were calculated using the SoundPlan computer model based on operational noise levels derived from manufacturer data and representative noise measurement data for similar car wash equipment.

2. Refer to Table 2 for applicable City exterior noise standards. Receptor locations R1 through R4 assume residential development. Receptor R5 is a commercial use outdoor eating area.

3. Refer to Appendix B for noise modeling assumptions.

Based on the modeling conducted, predicted operational noise levels would exceed applicable noise standards at nearby planned land uses located north of the project site. To minimize operational noise levels and to better ensure compliance with City noise standards, the following mitigation measures are recommended:

- Operational of the car wash should be limited to the daytime hours (7:00 a.m. to 10:00 p.m.).
- With the exception of the car wash entrance and exit, the car wash should be largely enclosed. The exterior façade of the car wash should be constructed of masonry block or material of similar density and usage.
- Dryer units should not exceed the manufacturer-provided operational noise levels, as identified in Appendix A of this report. The blower motors should be shielded sufficiently to interrupt the line-of-sight between the blower motor intake and the nearest adjacent property line located north of the car wash. Examples include the installation of a manufacturer-recommended shroud and/or mounting of the blower motors behind the exterior façade of the car wash. For instance, based on the proposed manufacturer's dryer system specifications (refer to Appendix A), it is recommended that the opening for the car wash tunnel exit not exceed 7.2 feet in height.
- Installation of an audible bay buzzer should be prohibited.

- Construction of a noise barrier at the northern property line. The noise barrier should be constructed of masonry block or material of similar density and usage. The barrier should be constructed to a minimum height of 8 feet above ground level with no visible air gaps at the base of the barrier or between barrier construction components.
- The installation of vents on the northern façade of the centralized vacuum building should be prohibited.

SIGNIFICANCE AFTER MITIGATION

The above-recommended noise reduction measures would substantially reduce predicted operational noise levels at nearby land uses. In addition, it is recommended that operation of the car wash be limited to the daytime hours (i.e., 7:00 a.m. to 10:00 p.m.). With implementation of the proposed noise mitigation measures predicted operational noise levels would not exceed the City's daytime noise standards. For informational purposes, two scenarios were modeled. Mitigation Scenario 1 includes the above-recommended shielding for the car wash exit bay, prohibited use of an audible bay buzzer, and construction of an approximately 8-foot noise barrier along the northern project site boundary. Mitigation Scenario 2 includes these same noise-reduction measures but with an approximately 10-foot noise barrier along the northern project site boundary. Predicted noise levels associated with these mitigation scenarios are discussed in greater detail, as follows:

MITIGATION SCENARIO 1

Predicted operational noise levels for Mitigation Scenario 1 are summarized in Table 5 and depicted in Figure 5. As depicted, the highest predicted operational noise levels at modeled receptor locations would range from approximately 54 dBA L_{eq} to 42 dBA L_{eq} . As noted above, it is recommended that operations not occur during the nighttime hours (10:00 p.m. to 7:00 a.m.). Predicted operational noise levels would not be predicted to exceed the City's corresponding daytime noise standards. The predicted highest average-hourly daytime noise levels (in dBA L_{eq}) at these receptors are depicted in Figure 5.

TABLE 5. PREDICTED OPERATIONAL NOISE LEVELS AT NEARBY RECEPTORS – WITH RECOMMENDED NOISE REDUCTION MEASURES AND 8-FOOT NOISE BARRIER

Receptor Location	Predicted Noise Level at Noise-Sensitive Receptor (dBA L_{eq}) ^{1,3}	Daytime/Nighttime Noise Standard ² (dBA L_{eq})	Exceeds Daytime/Nighttime Noise Standard?
R1 – Lot 4/Lot 5 Property Line	54.5	55/45	No/Yes
R2 – Lot 4	49.7	55/45	No/Yes
R3 – Lot 3/Lot 4 Property Line	42.8	55/45	No/No
R4 – Lot 3	42.1	55/45	No/No
R5 – Lot 5 Outdoor Eating Area	45.6	65/60	No/No

1. Predicted noise levels were calculated using the SoundPlan computer model based on operational noise levels derived from manufacturer data and representative noise measurement data for similar car wash equipment.

2. Refer to Table 2 for applicable City exterior noise standards. Receptor locations R1 through R4 assume residential development. Receptor R5 is a commercial use outdoor eating area.

3. Refer to Appendix B for noise modeling assumptions.

MITIGATION SCENARIO 2

Predicted operational noise levels for Mitigation Scenario 2 are summarized in Table 6 and depicted in Figure 6. As depicted in Table 6, the highest predicted operational noise levels at modeled receptor locations would range from approximately 52 dBA L_{eq} to 42 dBA L_{eq} . Predicted operational noise levels would not be predicted to exceed the City's corresponding daytime noise standards. As noted above, it is recommended that operations not occur during the nighttime hours (10:00 p.m. to 7:00 a.m.). The predicted highest average-hourly noise levels (in dBA L_{eq}) at these receptors are depicted in Figure 6.

TABLE 6. PREDICTED OPERATIONAL NOISE LEVELS AT NEARBY RECEPTORS – WITH RECOMMENDED NOISE REDUCTION MEASURES AND 10-FOOT NOISE BARRIER

Receptor Location	Predicted Noise Level at Noise-Sensitive Receptor (dBA L_{eq}) ^{1,3}	Daytime/Nighttime Noise Standard ² (dBA L_{eq})	Exceeds Daytime/Nighttime Noise Standard?
R1 – Lot 4/Lot 5 Property Line	51.6	55/45	No/Yes
R2 – Lot 4	49.0	55/45	No/Yes
R3 – Lot 3/Lot 4 Property Line	42.5	55/45	No/No
R4 – Lot 3	41.7	55/45	No/No
R5 – Lot 5 Outdoor Eating Area	45.6	65/60	No/No

1. Predicted noise levels were calculated using the SoundPlan computer model based on operational noise levels derived from manufacturer data and representative noise measurement data for similar car wash equipment.

2. Refer to Table 2 for applicable City exterior noise standards. Receptor locations R1 through R4 assume residential development. Receptor R5 is a commercial use outdoor eating area.

3. Refer to Appendix B for noise modeling assumptions.

SUMMARY OF FINDINGS

Based on the modeling conducted, predicted operational noise levels with the inclusion of recommended noise-reduction measures would not exceed applicable daytime noise standards at the nearest property line. With the inclusion of an approximate 8-foot barrier along the northern property line, predicted operational noise levels would approach, but would not exceed, the City's daytime noise standard of 55 dBA L_{eq} . Inclusion of an approximate 10-foot barrier at this same location would further reduce operational noise levels by approximately 3 dBA. To minimize operational noise levels and to better ensure compliance with City noise standards, the following measures are recommended:

- Operational of the car wash should be limited to the daytime hours (7:00 am to 10:00 pm).
- With the exception of the car wash entrance and exit, the car wash should be largely enclosed. The exterior façade of the car wash should be constructed of masonry block or material of similar density and usage.
- Dryer units should not exceed the manufacturer-provided operational noise levels, as identified in Appendix A of this report. The blower motors should be shielded sufficiently to interrupt the line-of-sight between the blower motor intake and the nearest adjacent property line located north of the car wash. Examples include the installation of a manufacturer-recommended shroud and/or mounting of the blower motors behind the exterior façade of the car wash. For instance, based on the proposed manufacturer's dryer system specifications (refer to Appendix A), it is recommended that the opening for the car wash tunnel exit not exceed 7.2 feet in height.
- Installation of an audible bay buzzer should be prohibited.
- Construction of a noise barrier at the northern property line. The noise barrier should be constructed of masonry block or material of similar density and usage. The barrier should be constructed to a minimum height of 8 feet above ground level with no visible air gaps at the base of the barrier or between barrier construction components.
- The installation of vents on the northern façade of the centralized vacuum building should be prohibited.

FIGURE 4. HIGHEST PREDICTED OPERATIONAL NOISE LEVELS AND NOISE CONTOUR MAP WITHOUT RECOMMENDED NOISE-REDUCTION MEASURES

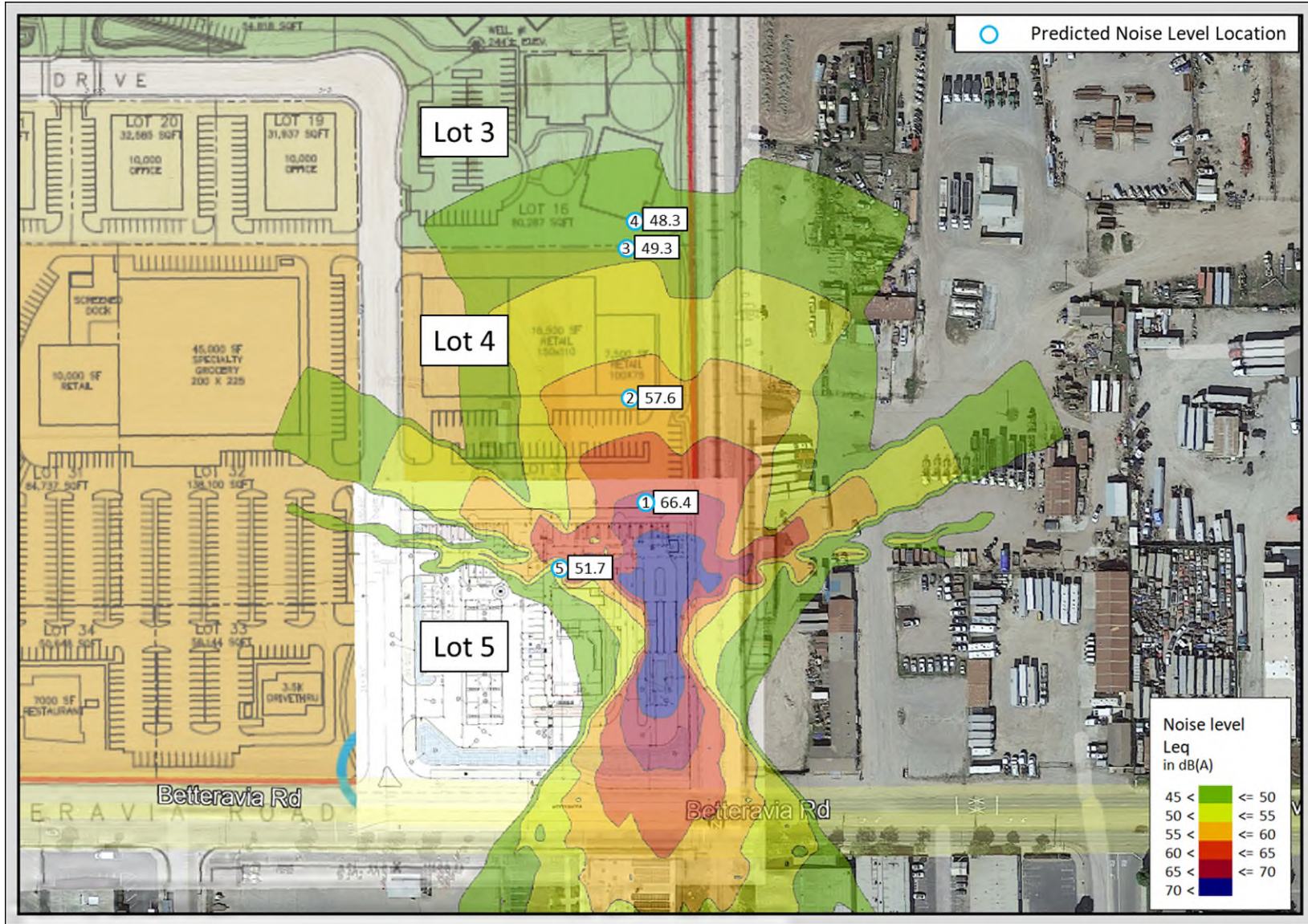
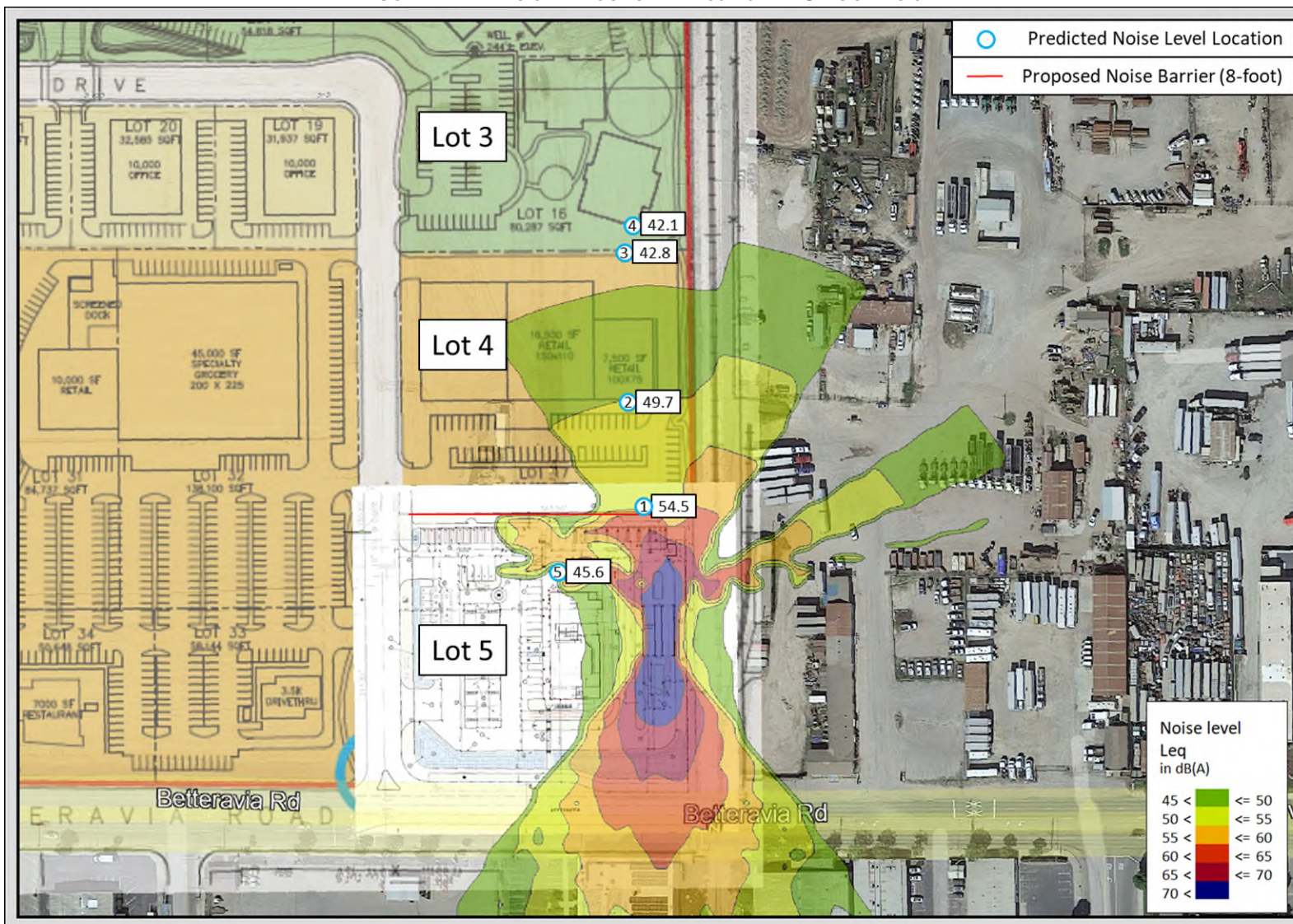
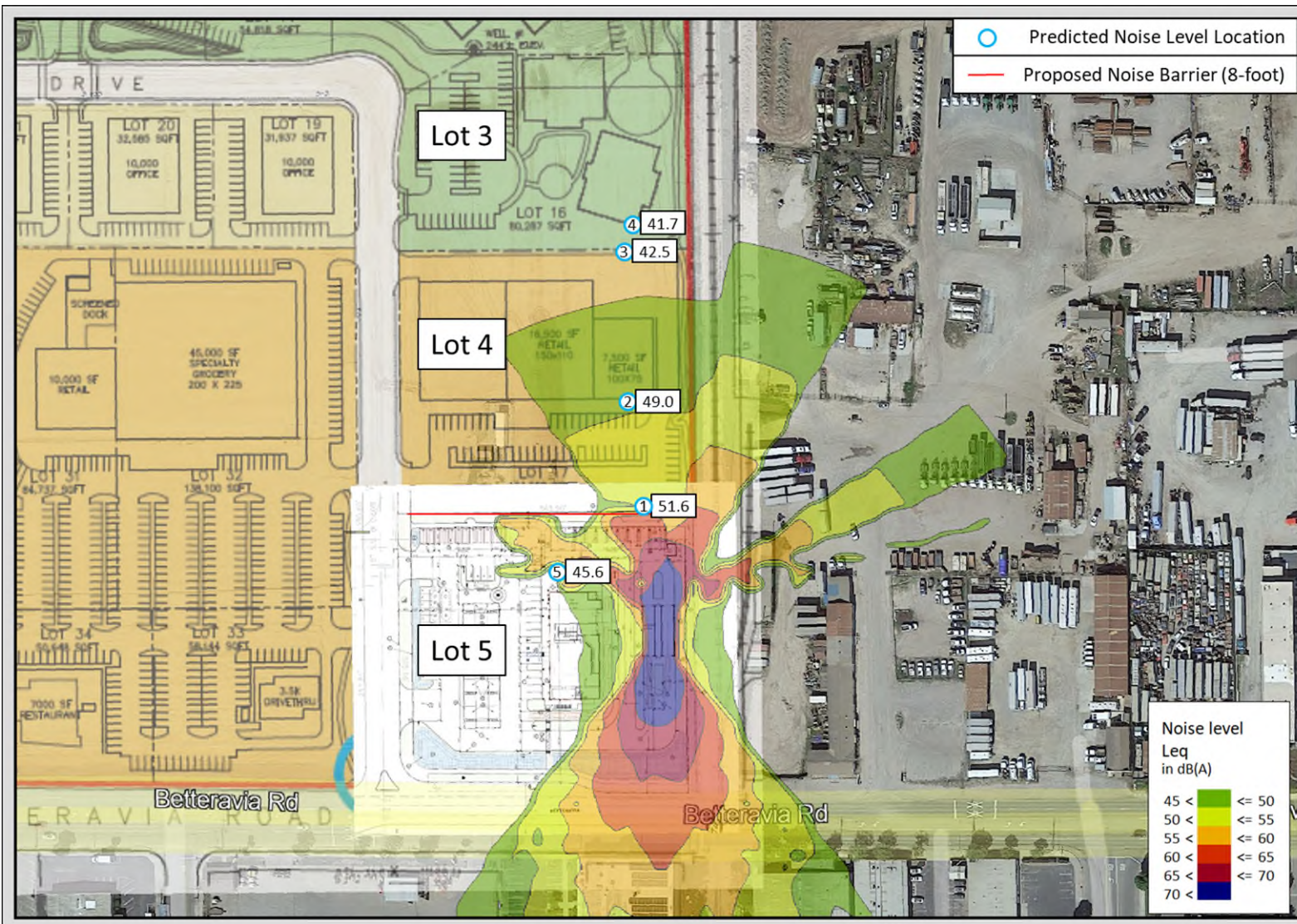


FIGURE 5. HIGHEST PREDICTED OPERATIONAL NOISE LEVELS AND NOISE CONTOUR MAP WITH RECOMMENDED NOISE-REDUCTION MEASURES AND 8-FOOT NOISE BARRIER



Note: Includes installation of an approximate 8-foot noise barrier along the northern property line.

FIGURE 6. HIGHEST PREDICTED OPERATIONAL NOISE LEVELS AND NOISE CONTOUR MAP WITH RECOMMENDED NOISE-REDUCTION MEASURES AND 10-FOOT NOISE BARRIER



Note: Includes installation of an approximate 10-foot noise barrier along the northern property line.

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APPENDICES

APPENDIX A

CAR WASH DRYER MANUFACTURER FACT SHEET

Introduction

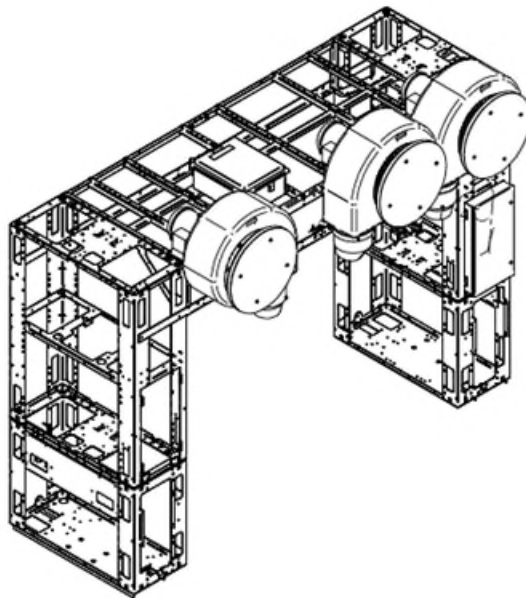
The AquaDri™ E-30*i* on-board dryer is offered as an option to the automatic carwash systems, an alternative to the free standing dryer. The on-board dryer assembly installs onto the AquaJet GT® series frame with the power and control connections to the main electrical enclosure and the PLC.

The on-board dryer uses high speed fan wheels to blow a high volume of air at the vehicle for the purpose of eliminating water drops from the vehicle, thus drying it. Since it requires less space than the Free standing dryer, it is more suitable for use with the shorter bays.

Mark VII AquaDri™ E-30*i* On-board Dryer

The Mark VII AquaDri™ E-30*i* on-board dryer consists of 3 - 10 HP motors, with one stationary nozzle in the middle, and two dual-position-tilting nozzles on each side. This dryer is installed on the frame at the back of the gantry. The electrical control enclosure is mounted to the top of the frame on the GT 500 and 700 or in the lower passenger side on the GT 300. The dual-position-tilting nozzles are programmed to aim at the front of the vehicle while the gantry moves toward it. The nozzles rotate down and aim at the sides of the vehicle when the gantry moves back towards the front of the vehicle.

Figure 01, AquaDri™ E-30*i* Dryer



Specification

Features and Equipment

- Directional, tilting nozzles alternately blow down the top, and side of the vehicles.
- Welded steel fans
- Dynamically balanced fans
- Molded Polyethylene fan housings
- Activation and control by gantry's PLC.
- 145 mph air speed (measured at nozzle at 5500 ft alt.)
- 3800 CFM (107.6 cmm) flow rating, each producer. (@ 5500 ft alt)



Specifications

The dimensions are measured with the Dryer's installed on an AquaJet GT®-Series machine. See figure 02 for dimensions.

AquaJet GT®-Series Machine Dimensions, with E-30i Dryers installed

Height	130" [330.2 cm] installed
Width	98.5" / [250.2 cm] (150" / [381 cm] with gantry)
Length (depth of machine)	78.7" / [190.5 cm]
Weight	3,965 Lbs.

Vehicle Clearance

Height	86" from bay floor to tip of dryer nozzle (86" AquaJet GT®-series' gantry clearance)
Width	104" / [264 cm] (AquaJet GT®-series' gantry clearance)

Note: Vehicle clearance heights measure from base of gantry tracks. Actual heights may vary due to slope on the bay floor.

Electrical

			60 Hz 3phase	
Domestic	VAC	208		230
	Amp	96		84

Note: The amp specifications shown above are consumed (drawn) amps. Supply disconnect must be sized to comply with national (NEC) and local electrical codes. (minimum 125 amp of service is recommended)

Service factor for motors is 1.15

Recommended maximum starts for the motors is 20/hr.

Sound Decibels

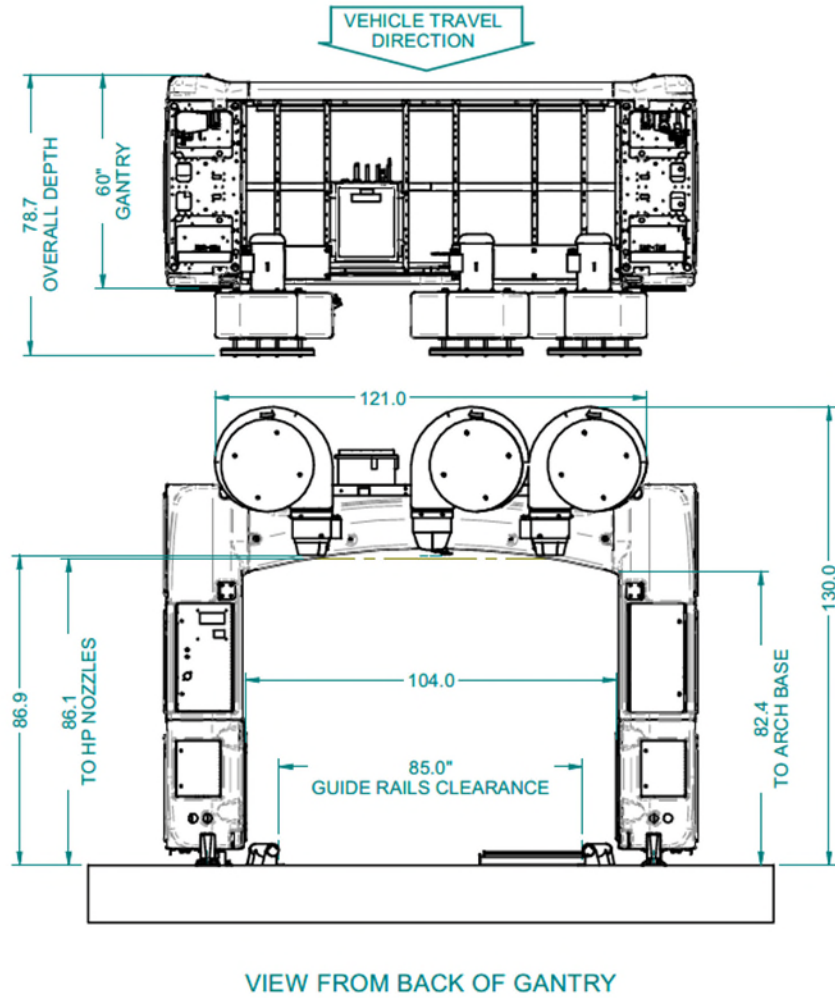
dB A Weighted Slow, From Exit Side.

	10'	20'	30'	40'	50'
E30i	96	92	89	85	82

Note: Mark VII does not warrant or guarantee that a specific site or piece of equipment will achieve a certain performance level. Actual results may vary.



Figure 02, AquaJet GT® Series with E-30i dryer, Vehicle Clearance



APPENDIX B

AMBIENT NOISE MONITORING DATA



NOISE MEASUREMENT SURVEY FORM

SHEET 1 OF 2

DATE:	3/3/2022
PROJECT:	Betteravia Carwash
LOCATION:	Santa Maria, CA
MONITORING STAFF:	Jon Pambakian

LOCATION MAP: (Include a map of noise measurement locations AND photographs for measurement locations on attached worksheet. Include additional sheets as necessary. Where possible include GPS coordinates.)



NOISE MEASUREMENT CONDITIONS & EQUIPMENT

MET CONDITIONS & MONITORING EQUIPMENT:		TEMP: 67 - 69 F. HUMIDITY: 35% WIND SPEED: 1 - 2 MPH WIND DIR: S-SW GROUND: Dry
		CLOUD COVER BY CLASS (OC=OVERCAST): 3 (1. HEAVY OC, 2. LIGHT OC, 3. SUNNY, 4. CLEAR NIGHT, 5. OC NIGHT)
		MET. METER: Kestrel 5500
NOISE MONITORING EQUIPMENT:		LARSON DAVIS SLM MODEL: LxT S/N: 4526
		MICROPHONE: S/N: 2744
		CALIBRATOR: CAL200 S/N: 2744
NOISE MONITORING SETUP:		WITHIN 10 FT OF REFLECTIVE SURFACE?: NO MICROPHONE HEIGHT AGL (FT): 5
		CALIBRATED PRIOR TO AND UPON COMPLETION OF MEASUREMENTS: METER SETTINGS: A-WHT SLOW

NOISE & TRAFFIC MEASUREMENTS

LOCATION	MEASUREMENT DATE/TIME	DURATION (Minutes)	MEASUREMENT LOCATION	PRIMARY NOISE SOURCES NOTED	MEASURED NOISE LEVELS LEQ
1	3/3/22 11:36	10		Traffic	42.3
2	3/3/22 12:14	10		Traffic	67.3
3	3/3/22 12:31	10		Traffic	68.9



NOISE MEASUREMENT SURVEY FORM

SHEET 2 OF 2

DATE:	3/3/2022
PROJECT:	Betteravia Carwash
LOCATION:	Santa Maria, CA
MONITORING STAFF:	Jon Pambakian

SITE PHOTO(S): (Refer to data sheets for noise measurement locations)

MEASUREMENT LOCATION 1



MEASUREMENT LOCATION 2



MEASUREMENT LOCATION 3



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