

Quick Quack Car Wash (Store #44-110)

Noise Impact Study

City of Victorville, CA

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1.0 Executive Summary

This report has been prepared to provide the calculated noise projections from the proposed Quick Quack Car Wash located near the intersection of Palmdale & Cantina, in the City of Victorville, CA. All noise level projections are compared to the existing ambient condition.

1.1 Findings and Conclusions

Two (2) baseline ambient measurements were performed over a 15-minute period at the Project site and represent the ambient noise condition within the Project vicinity. Ambient noise data indicate the average noise level of 55 to 59 dBA Leq. The predominant source of noise impacting the commercially zoned parcels to the north, east, west, and south is traffic noise propagating from Palmdale Rd.

This study compares the Project's operational noise levels to two (2) different noise assessment scenarios: 1) Project only operational noise level projections, 2) Project plus ambient noise level projections.

Operational noise levels are anticipated to range between 35 dBA to 62 dBA Leq at adjacent commercial uses. Project plus ambient noise level projections are anticipated to range between 57 to 63 dBA Leq at adjacent commercial receptors. Levels will increase up to 6 dB at adjacent commercial properties. This increase in levels will have a "less than significant" impact in regards to compliance with the City's standard.

The following outlines the Project design features:

1. The Project will incorporate an IDC 120HP Stealth Blower system or equivalent blower system to meet these acoustical benchmarks.
2. The Project proposes to house the vacuum turbine motors inside a 6' tall four sided CMU enclosure.

2.0 Introduction

2.1 Purpose of Analysis and Study Objectives

The purpose of this noise impact study is to evaluate the potential noise impacts for the Project study area and to recommend noise mitigation measures, if necessary, to minimize the potential noise impacts. The assessment was conducted and compared to potentially applicable noise standards set forth by the State and/or local agencies. Consistent with the City's Noise Guidelines, the Project must demonstrate compliance with the applicable noise zoning ordinance and sound attenuation requirements.

The following is provided in this report:

- A description of the study area and the proposed Project
- Information regarding the fundamentals of noise
- A description of the local noise guidelines and standards
- An evaluation of the existing ambient noise environment
- An analysis of stationary noise impact (e.g. blowers and vacuums) from the Project site to adjacent land uses
- An analysis of construction noise to adjacent uses

2.2 Site Location and Study Area

The Project site is located at the corner of Palmdale Rd. and Cantina St. in Victorville, CA as shown in Exhibit A. The land uses directly surrounding the Project include commercial to the north, east, south, and west.

2.3 Proposed Project Description

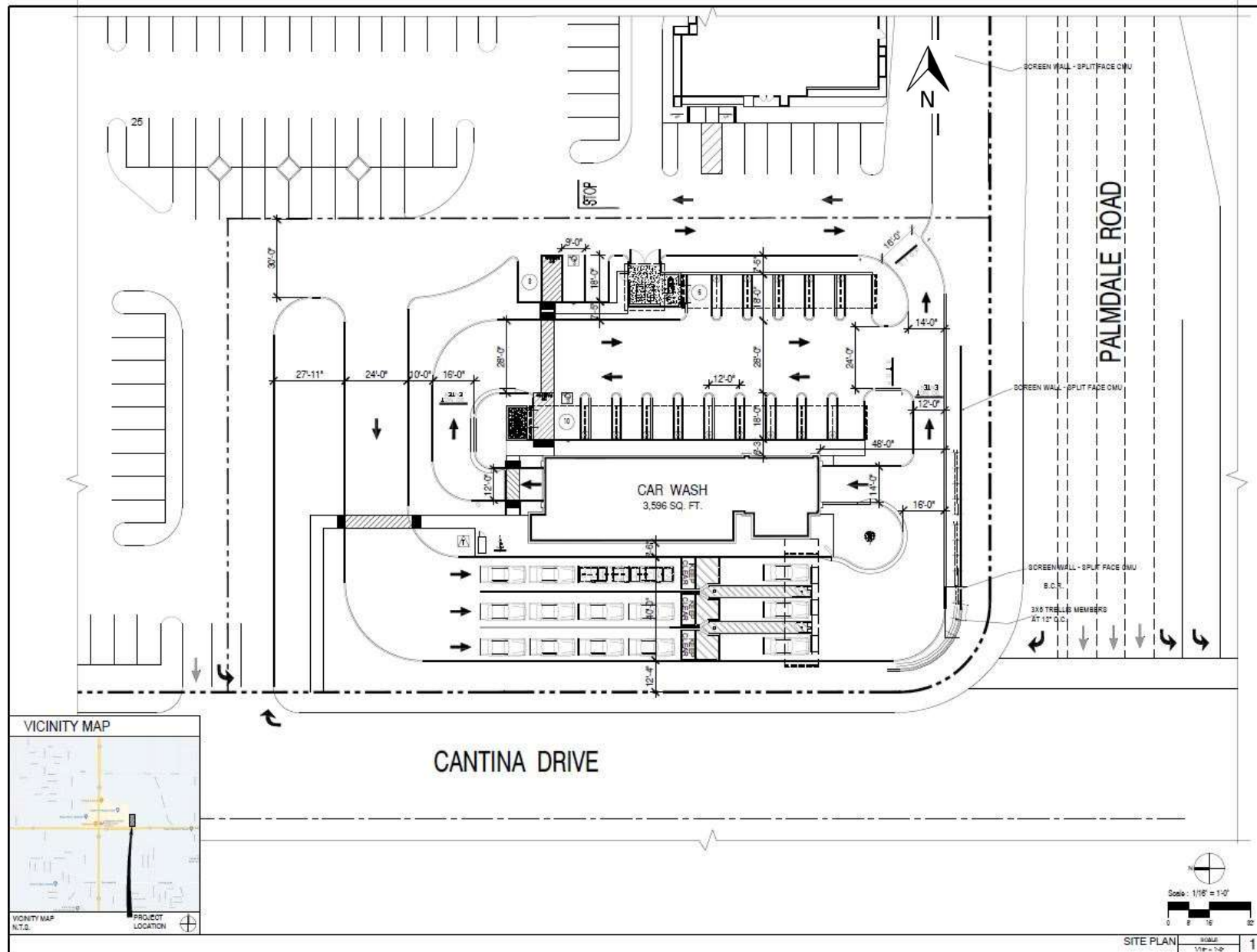
The Project proposes to develop a 106' long tunnel within 3,596 square feet automatic car wash and 16 vacuum bays. Vacuum turbine motors will be housed inside a 6' tall four sided CMU enclosure.

Project operations will occur from 8 AM to 6 PM. A noise study has been prepared which identifies the Project's potential impact to the adjacent uses and compares the noise level projections to the ambient condition. The site plan used for this is illustrated in Exhibit B.

Exhibit A Location Map



Exhibit B Site Plan



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21571 GATEWAY CENTER DRIVE, SUITE 20
DIAMOND BAR, CA 91765
(714) 955-1010



NOTE: This information is prepared in reliance on a report by a licensed professional engineer and is not intended to be used for any other purpose. No warranty is made by the engineer or the firm for any use other than that intended.

Project:



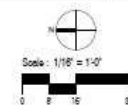
(STORE 44-110)
CANTINA AND PALMDALE ROAD
VICTORVILLE, CA

Client:
RICH DEVELOPMENT
ENTERPRISES, INC.
600 N. TUSTIN AVE., SUITE 100
SANTA ANA, CA 92705

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Project No.	210685.0
Drawn By:	
Reviewed By:	AS NOTED
Scale:	
Date:	
Planner:	
Client Rep:	

SITE PLAN

AS 1.01



SITE PLAN
1

3.0 Fundamentals of Noise

This section of the report provides basic information about noise and presents some of the terms used within the report.

3.1 Sound, Noise, and Acoustics

Sound is a disturbance created by a moving or vibrating source and is capable of being detected by the hearing organs. Sound may be thought of as the mechanical energy of a moving object transmitted by pressure waves through a medium to a human ear. For traffic or stationary noise, the medium of concern is air. *Noise* is defined as sound that is loud, unpleasant, unexpected, or unwanted.

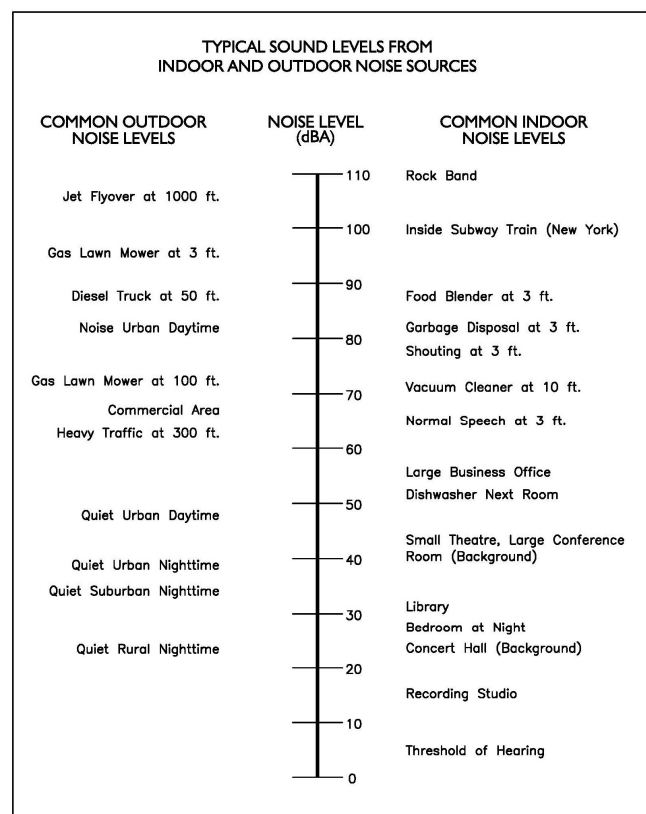
3.2 Frequency and Hertz

A continuous sound is described by its *frequency* (pitch) and its *amplitude* (loudness). Frequency relates to the number of pressure oscillations per second. Low-frequency sounds are low in pitch (bass sounding) and high-frequency sounds are high in pitch (squeak). These oscillations per second (cycles) are commonly referred to as Hertz (Hz). The human ear can hear from the bass pitch starting at 20 Hz to the high pitch of 20,000 Hz.

3.3 Sound Pressure Levels and Decibels

The *amplitude* of a sound determines its loudness. The loudness of sound increases or decreases as the amplitude increases or decreases. Sound pressure amplitude is measured in units of micro-Newton per square inch meter (N/m^2), also called micro-Pascal (μPa). One μPa is approximately one hundred billionths (0.0000000001) of normal atmospheric pressure. Sound pressure level (SPL or L_p) is used to describe in logarithmic units the ratio of actual sound pressures to a reference pressure squared. These units are called decibels abbreviated dB. Exhibit C illustrates references sound levels for different noise sources.

Exhibit C: Typical A-Weighted Noise Levels



3.4 Addition of Decibels

Because decibels are on a logarithmic scale, sound pressure levels cannot be added or subtracted by simple plus or minus addition. When two sounds or equal SPL are combined, they will produce an SPL 3 dB greater than the original single SPL. In other words, sound energy must be doubled to produce a 3 dB increase. If two sounds differ by approximately 10 dB, the higher sound level is the predominant sound.

3.5 Human Response to Changes in Noise Levels

In general, the healthy human ear is most sensitive to sounds between 1,000 Hz and 5,000 Hz, (A-weighted scale) and it perceives a sound within that range as being more intense than a sound with a higher or lower frequency with the same magnitude. For purposes of this report as well as with most environmental documents, the A-scale weighting is typically reported in terms of A-weighted decibel (dBA). Typically, the human ear can barely perceive the change in the noise level of 3 dB. A change in 5 dB is readily perceptible, and a change in 10 dB is perceived as being twice or half as loud. As previously discussed, a doubling of sound energy results in a 3 dB increase in sound, which means that a doubling of sound energy (e.g. doubling the volume of traffic on a highway) would result in a barely perceptible change in sound level.

3.6 Noise Descriptors

Noise in our daily environment fluctuates over time. Some noise levels occur in regular patterns, others are random. Some noise levels are constant while others are sporadic. Noise descriptors were created to describe the different time-varying noise levels.

A-Weighted Sound Level: The sound pressure level in decibels as measured on a sound level meter using the A-weighted filter network. The A-weighting filter de-emphasizes the very low and very high-frequency components of the sound in a manner similar to the response of the human ear. A numerical method of rating human judgment of loudness.

Ambient Noise Level: The composite of noise from all sources, near and far. In this context, the ambient noise level constitutes the normal or existing level of environmental noise at a given location.

Community Noise Equivalent Level (CNEL): The average equivalent A-weighted sound level during a 24-hour day, obtained after the addition of five (5) decibels to sound levels in the evening from 7:00 to 10:00 PM and after the addition of ten (10) decibels to sound levels in the night before 7:00 AM and after 10:00 PM.

Decibel (dB): A unit for measuring the amplitude of a sound, equal to 20 times the logarithm to the base 10 of the ratio of the pressure of the sound measured to the reference pressure, which is 20 micro-pascals.

dB(A): A-weighted sound level (see definition above).

Equivalent Sound Level (LEQ): The sound level corresponding to a steady noise level over a given sample period with the same amount of acoustic energy as the actual time-varying noise level. The energy average noise level during the sample period.

Habitable Room: Any room meeting the requirements of the Uniform Building Code or other applicable regulations which is intended to be used for sleeping, living, cooking, or dining purposes, excluding such enclosed spaces as closets, pantries, bath or toilet rooms, service rooms, connecting corridors, laundries, unfinished attics, foyers, storage spaces, cellars, utility rooms, and similar spaces.

L(n): The A-weighted sound level exceeded during a certain percentage of the sample time. For example, L10 in the sound level exceeded 10 percent of the sample time. Similarly L50, L90, and L99, etc.

Noise: Any unwanted sound or sound which is undesirable because it interferes with speech and hearing, is intense enough to damage hearing, or is otherwise annoying. The State Noise Control Act defines noise as "...excessive undesirable sound...".

Outdoor Living Area: Outdoor spaces that are associated with residential land uses typically used for passive recreational activities or other noise-sensitive uses. Such spaces include patio areas, barbecue areas, jacuzzi areas, etc. associated with residential uses; outdoor patient recovery or resting areas associated with hospitals, convalescent hospitals, or rest homes; outdoor areas associated with places of worship which have a significant role in services or other noise-sensitive activities; and outdoor school facilities routinely used for educational purposes which may be adversely impacted by noise. Outdoor areas usually not included in this definition are: front yard areas, driveways, greenbelts, maintenance areas and storage areas associated with residential land uses; exterior areas at hospitals that are not used for patient activities; outdoor areas associated with places of worship and principally used for short-term social gatherings; and, outdoor areas associated with school facilities that are not typically associated with educational uses prone to adverse noise impacts (for example, school play yard areas).

Percent Noise Levels: See L(n).

Sound Level (Noise Level): The weighted sound pressure level obtained by use of a sound level meter having a standard frequency filter for attenuating part of the sound spectrum.

Sound Level Meter: An instrument, including a microphone, an amplifier, an output meter, and frequency weighting networks for the measurement and determination of noise and sound levels.

Single Event Noise Exposure Level (SENEL): The dB(A) level which, if it lasted for one second, would produce the same A-weighted sound energy as the actual event.

3.7 Sound Propagation

As sound propagates from a source it spreads geometrically. Sound from a small, localized source (i.e., a point source) radiates uniformly outward as it travels away from the source in a spherical pattern. The sound level attenuates at a rate of 6 dB per doubling of distance. The movement of vehicles down a roadway makes the source of the sound appear to propagate from a line (i.e., line source) rather than a point source. This line source results in the noise propagating from a roadway in a cylindrical spreading versus a spherical spreading that results from a point source. The sound level attenuates for a line source at a rate of 3 dB per doubling of distance.

As noise propagates from the source, it is affected by the ground and atmosphere. Noise models use hard site (reflective surfaces) and soft site (absorptive surfaces) to help calculate predicted noise levels. Hard site conditions assume no excessive ground absorption between the noise source and the receiver. Soft site conditions such as grass, soft dirt, or landscaping attenuate noise at a rate of 1.5 dB per doubling of distance. When added to the geometric spreading, the excess ground attenuation results in an overall

noise attenuation of 4.5 dB per doubling of distance for a line source and 7.5 dB per doubling of distance for a point source.

Research has demonstrated that atmospheric conditions can have a significant effect on noise levels when noise receivers are located 200 feet from a noise source. Wind, temperature, air humidity, and turbulence can further impact how far sound can travel.

4.0 Regulatory Setting

The proposed Project is located in the City of Victorville, California, and noise regulations are addressed through the efforts of various federal, state, and local government agencies. The agencies responsible for regulating noise are discussed below.

4.1 Federal Regulations

The adverse impact of noise was officially recognized by the federal government in the Noise Control Act of 1972, which serves three purposes:

- Publicize noise emission standards for interstate commerce
- Assist state and local abatement efforts
- Promote noise education and research

The Federal Office of Noise Abatement and Control (ONAC) originally was tasked with implementing the Noise Control Act. However, it was eventually eliminated leaving other federal agencies and committees to develop noise policies and programs. Some examples of these agencies are as follows: The Department of Transportation (DOT) assumed a significant role in noise control through its various agencies. The Federal Aviation Agency (FAA) is responsible for regulating noise from aircraft and airports. The Federal Highway Administration (FHWA) is responsible for regulating noise from the interstate highway system. The Occupational Safety and Health Administration (OSHA) is responsible for the prohibition of excessive noise exposure to workers. The Housing and Urban Development (HUD) is responsible for establishing noise regulations as it relates to exterior/interior noise levels for new HUD-assisted housing developments near high noise areas.

The federal government advocates that local jurisdictions use their land use regulatory authority to arrange new development in such a way that “noise sensitive” uses are either prohibited from being constructed adjacent to a highway or that the developments are planned and constructed in such a manner that potential noise impacts are minimized.

Since the federal government has preempted the setting of standards for noise levels that can be emitted by the transportation source, the City is restricted to regulating the noise generated by the transportation system through nuisance abatement ordinances and land use planning.

4.2 State Regulations

Established in 1973, the California Department of Health Services Office of Noise Control (ONC) was instrumental in developing regulatory tools to control and abate noise for use by local agencies. One significant model is the “Land Use Compatibility for Community Noise Environments Matrix.” The matrix allows the local jurisdiction to clearly delineate the compatibility of sensitive uses with various incremental levels of noise.

The State of California has established noise insulation standards as outlined in Title 24 and the Uniform Building Code (UBC) which in some cases requires acoustical analyses to outline exterior noise levels and

to ensure interior noise levels do not exceed the interior threshold. The State mandates that the legislative body of each county and city adopt a noise element as part of its comprehensive general plan. The local noise element must recognize the land use compatibility guidelines published by the State Department of Health Services. The guidelines rank noise land use compatibility in terms of normally acceptable, conditionally acceptable, normally unacceptable, and clearly unacceptable as illustrated in Exhibit D from the Victorville General Plan.

Exhibit D: Land Use Compatibility Guidelines

Table N-3 Victorville Land Use Compatibility Standards							
Land Use Categories	Community Noise Exposure Ldn or CNEL, dB						
	55	60	65	70	75	80 +	
Residential - Low Density, Single Family, Duplex, Multi-family, Mobile Home	1	1	2	2	3	4	4
Transient Lodging - Motels, Hotels	1	1	2	2	3	3	4
Schools, Libraries, Churches, Hospitals, Nursing Homes	1	1	2	3	3	4	4
Auditoriums, Concert Halls, Amphitheaters	2	2	3	3	4	4	4
Sports Arena, Outdoor Spectator Sports	2	2	2	2	3	3	3
Playgrounds, Neighborhood Parks	1	1	1	2	3	3	3
Golf Courses, Riding Stables, Water Recreation, Cemeteries	1	1	1	2	2	4	4
Office Buildings, Business Commercial, Retail Commercial and Professional	1	1	1	2	2	3	3
Industrial, Manufacturing, Utilities	1	1	1	1	2	2	2
Agriculture	1	1	1	1	1	1	1
Legend: 1. NORMALLY ACCEPTABLE: Specified land use is satisfactory, based upon the assumption that any buildings involved are of normal conventional construction, without any special noise insulation requirements. 2. CONDITIONALLY ACCEPTABLE: New construction or development should be undertaken only after a detailed analysis of the noise reduction requirements is made and Schools, Libraries, Churches, Hospitals, Nursing Homes 1 needed noise insulation features included in the design. Conventional construction, with closed windows and fresh air supply systems or air conditioning will normally suffice. 3. NORMALLY UNACCEPTABLE: New construction or development should generally be discouraged. If new construction or development does proceed, a detailed analysis of the noise reduction requirements must be made and needed noise insulation features included in the design. 4. CLEARLY UNACCEPTABLE: New construction or development should generally not be undertaken.							

4.3 City of Victorville Noise Regulations

The City of Victorville outlines their noise regulations and standards within the City's Noise Element from the General Plan and Chapter 13.01 of the Municipal Code. For purposes of this analysis, the City's General Plan and Noise Ordinance is used to evaluate the roadway noise and stationary noise impacts to and from the proposed project. The Noise Element outlines Goals and Policies and establishes Noise/Land Use Compatibility Criteria (Table N-3). This assessment will compare the project noise levels to the commercial noise limits since the proposed project and surrounding uses are zoned as commercial land. The project impacts were compared to the City's commercial noise standards

City of Victorville General Plan

To ensure that noise does not affect the health and serenity of Victorville residents, this element provides a systematic approach to identifying and appraising excessive noise in the Planning Area, quantifying noise levels, and addressing excessive noise exposure, and community planning for the regulation of noise. This element includes policies, standards, criteria, programs, diagrams, a reference to action items, and maps related to protecting public health and welfare from noise.

GOAL #1: NOISE SENSITIVITY IDENTIFY SIGNIFICANT NOISE SOURCES THAT COULD ADVERSELY AFFECT COMMUNITY.

Objective 1.1: Locate noise sensitive land uses away from existing excessive noise sources, and locate new excessive noise generators away from existing sensitive land uses

Policy 1.1.1: Implement Table N-3 regarding placement of new land uses.

Implementation Measure 1.1.1.1: Continue to assess projects through the subdivision, site plan, conditional use permit, and other development review processes and incorporate conditions of approval which ensure noise compatibility where appropriate.

Implementation Measure 1.1.1.2: Prohibit new single family residential land uses in areas with a CNEL of 65 dB or greater.

Implementation Measure 1.1.1.3: Require a noise study to be performed and appropriate noise attenuation to be incorporated prior to approving any multifamily or mixed-use residential development in an area with a CNEL of 65 dB or greater.

Policy 1.1.2: Continue to ensure that there is no conflict or inconsistency between the operation of the Southern California Logistics Airport and future land uses within the Planning Area.

Implementation Measure 1.1.2.1: Continue to monitor Southern California Logistics Airport operations to ensure there is no conflict or inconsistency between the operation of the Southern California Logistics Airport and future land uses within the Planning Area.

Implementation Measure 1.1.2.2: Work closely with Southern California Logistics Airport planners to ensure that future master plan expansions do not impact sensitive Victorville land uses.

Implementation Measure 1.1.2.3: Require Southern California Logistics Airport to update its Specific Plan as directed by the City to accommodate changes in its master plan.

Objective 1.2: Design new transportation facilities to minimize noise impacts on nearby sensitive sources

Policy 1.2.1: Include noise mitigation measures in the design and use of new roadway projects.

Implementation Measure 1.2.1.1: Continue to use special paving materials that will buffer roadway noise.

Implementation Measure 1.2.1.2: Incorporate adequate setbacks in roadway design to maximize the distance from sensitive land uses.

Implementation Measure 1.2.1.3: Restrict new truck routes to roadways that are located away from sensitive land uses.

Policy 1.2.2: Promote noise mitigation measures in the design and use of new rail projects.

Implementation Measure 1.2.2.1: Continue to coordinate with regional agencies and rail providers to incorporate adequate setbacks in rail line to maximize the distance from sensitive land uses.

GOAL #2 NOISE CONTROL MANAGE THE AFFECTS OF NOISE EMISSIONS TO HELP ENSURE REDUCTION OF ADVERSE AFFECTS ON THE COMMUNITY

Objective 2.1: Ensure existing and future noise sources are properly attenuated Policy 2.1.1: Continue to implement acceptable standards for noise for various land uses throughout the City.

Implementation Measure 2.1.1.1: Require a noise study to be performed and appropriate noise attenuation to be incorporated prior to approving any multifamily or mixed-use residential development in an area with a CNEL of 65 dB or greater.

Implementation Measure 2.1.1.2: Monitor noise complaints and enforce provisions of the City noise ordinance.

Implementation Measure 2.1.1.3: Discourage location of new educational facilities in areas with noise levels greater than 65 dB CNEL.

Implementation Measure 2.1.1.5: Continue to restrict noise and require mitigation measures for any noise-emitting construction equipment or activity.

Implementation Measure 2.1.1.6: Reduce speed limits on arterial streets if necessary to lower sound to appropriate levels for adjacent and surrounding land uses.

Objective 2.2: Ensure the community is properly informed regarding potential noise from SCLA operations

Policy 2.2.1: Incorporate current information regarding SCLA operations into the land use planning process.

Implementation Measure 2.2.1.1: Place the following condition on all new residential projects within the Planning Area: The applicant/developer shall record an Airport Location Notice, which discloses the direction and distance from Southern California Logistics Airport. This notice shall record with the final map, including legal descriptions for all lots, and shall be subject to staff review and approval.

Implementation Measure 2.2.1.2: Place the following condition on all development within the airport influence area, roughly north of Mojave Drive and west of Amargosa Road: The applicant/developer shall record an Avigation Easement, which allows for the continued operation of overhead flights from Southern California Logistics Airport. The Avigation Easement shall be recorded prior to the issuance of any building permits, and shall be subject to staff review and approval.

City of Victorville Municipal Code

The City of Victorville outlines their noise regulations and standards within the Noise Element from the General Plan and Municipal Code. For purposes of this analysis, the City's General Plan and Noise Ordinance (Chapter 13.01) is used to evaluate the stationary noise impacts from the proposed project. The Noise Element outlines Goals and Policies and establishes Noise/Land Use Compatibility Criteria. This assessment will compare the project noise levels to the noise limits in Section 13.01.040 of the Municipal Code.

13.01.040 Base ambient noise levels.

All ambient noise measurements shall commence in decibels within the respective zones and times as follows:

Zone Time Sound Level Decibels:

Residential	Nighttime (10:00pm to 7:00am)	55 dB(A)
	Daytime (7:00am to 10:00pm)	65 dB(A)
Commercial	Anytime	70 dB(A)
Industrial	Anytime	75 dB(A)

If the ambient noise level exceeds the applicable limit as noted in the above table, the ambient noise level shall be the standard.

(Ord. 1962 § 2 (part), 2002)

13.01.050 Noise levels prohibited.

Noise levels shall not exceed the ambient noise levels in Section 13.01.040 by the following dB(A) levels for the cumulative period of time specified:

- (1) Less than 5dB(A) for a cumulative period of more than thirty minutes in any hour;
- (2) Less than 10 dB(A) for a cumulative period of more than fifteen minutes in any hour;
- (3) Less than 15 dB(A) for a cumulative period of more than five minutes in any hour;
- (4) Less than 20 dB(A) for a cumulative period of more than one minute in any hour;
- (5) 20 dB(A) or more for any period of time.

(Ord. 1962 § 2 (part), 2002)

4.4 Thresholds Applied to Project

The Municipal Code and General Plan Section 13.01.050 states:

Noise levels shall not exceed the ambient noise levels in Section 13.01.040 by the following dB(A) levels for the cumulative period of time specified:

- (1) Less than 5dB(A) for a cumulative period of more than thirty minutes in any hour;
- (2) Less than 10 dB(A) for a cumulative period of more than fifteen minutes in any hour;
- (3) Less than 15 dB(A) for a cumulative period of more than five minutes in any hour;
- (4) Less than 20 dB(A) for a cumulative period of more than one minute in any hour;
- (5) 20 dB(A) or more for any period of time.

(Ord. 1962 § 2 (part), 2002)

The land uses directly surrounding the Project include commercial to the north, east, south, and west. The maximum commercial anytime “base ambient noise level” outlined in Section 13.01.040 of 70 dBA will be used as the maximum threshold for this proposed project.

The Project will operate during the daytime hours of 8 AM to 6 PM. Construction activities with noise-producing equipment will occur during the permissible hours of 7 AM to 6 PM Monday through Friday and 8 AM to 5 PM on Saturdays.

5.0 Study Method and Procedure

The following section describes the noise modeling procedures and assumptions used for this assessment.

5.1 Noise Measurement Procedure and Criteria

MD conducted two (2) short-term noise measurements near the Project site and represents the noise level from the existing traffic conditions along Palmdale Rd. (see Appendix A for the field sheet data).

5.2 Stationary Noise Modeling

SoundPLAN (SP) acoustical modeling software was utilized to model future worst-case stationary noise impacts to the adjacent land uses. SP is capable of evaluating multiple stationary noise source impacts at various receiver locations. SP's software utilizes algorithms (based on the inverse square law and reference equipment noise level data) to calculate noise level projections. The software allows the user to input specific noise sources, spectral content, sound barriers, building placement, topography, and sensitive receptor locations.

The future worst-case noise level projections were modeled using referenced sound level data for the various stationary on-site sources (vacuums and car wash blowers at the exit). The SP model assumes a total of 16 vacuums and the dryer systems are operating simultaneously (worst-case scenario) when the noise will in reality be intermittent and lower in noise level. In addition, the modeling takes into account the louver, windows, and openings on the car wash tunnel based on the plan elevations. The reference vacuum equipment sound level data is provided in Appendix C.

All other noise-producing equipment (e.g., compressors, pumps) will be housed within mechanical equipment rooms.

The following outlines the Project design features:

1. The Project will incorporate an IDC 120HP Stealth Blower system or equivalent blower system to meet these acoustical benchmarks.
2. The Project proposes to house the vacuum turbine motors inside a 6' tall four sided CMU enclosure.

Exhibit E Measurement Locations

= Short-Term
Monitoring Location



6.0 Existing Noise Environment

Two (2) 15-Minute Short-term ambient noise measurements were conducted on or near the Project's property lines to represent the existing noise levels. The measurement measured the second-by-second Leq, Lmin, Lmax, and other statistical data (e.g. L2, L8...) over a 15-minute period. Noise data indicates that traffic along Palmdale Rd. is the primary source of noise impacting the site and the adjacent uses. This assessment utilizes the ambient noise data as a basis and compares Project operational levels to said data.

6.1 Short-Term Noise Measurement Results

The results of the short-term noise data are presented in Table 1. NM1 represents the noise level at the eastern commercial properties. NM2 represents the noise level at the center of the proposed project location parcel. These assumptions are based on location and distance to the centerline of Palmdale Rd.

Table 1: Short-Term Noise Measurement Data (dBA)

Location ¹	Time	dB(A)							
		L _{EQ}	L _{MAX}	L _{MIN}	L ₂	L ₈	L ₂₅	L ₅₀	L ₉₀
NM1	12:04APM-12:19PM	59.4	73.4	46.9	67.5	63.4	59.4	55.9	50.1
NM2	12:24PM-12:39PM	55.2	75.0	45.4	63	57.4	53.4	51	47.5
Notes: ¹ . See Appendix A for the field sheet.									

Noise data indicates the ambient noise level ranged between 55.2 dBA Leq to 59.4 dBA Leq near the Project site and surrounding area. Maximum levels reached 75 dBA as a result of traffic along Palmdale Rd. Additional field notes and photographs are provided in Appendix A.

For this evaluation, MD has utilized the measured ambient noise levels and has compared the Project's projected noise levels to the said ambient level.

7.0 Future Noise Environment Impacts

This assessment analyzes future noise impacts as a result of the Project. The analysis details the estimated exterior noise levels. Stationary noise impacts are analyzed from the noise sources on-site such as dryers/blowers and vacuums.

7.1 Stationary Source Noise

The following outlines the exterior noise levels associated with the proposed Project.

7.1.1 Noise Impacts to Off-Site Receptors Due to Stationary Sources

Sensitive receptors that may be affected by Project operational noise includes commercial uses to the north, east, south, and west. The worst-case stationary noise was modeled using SoundPLAN acoustical modeling software.

A total of four (4) receptors (R1 – R4) were modeled to evaluate the proposed Project’s operational impact. R1 – R4 represent the noise levels at surrounding property lines or building facades. All yellow dots represent adjacent commercial use properties.

This study compares the Project’s operational noise levels to two (2) different noise assessment scenarios: 1) Project Only operational noise level projections, 2) Project plus ambient noise level projections.

Project Operational Noise Levels

Exhibit F shows the “Project only” operational noise levels at the property lines and/or sensitive receptor area. Operational noise levels are anticipated to range between 35 dBA to 62 dBA Leq at adjacent commercial uses. Exhibit C provides a scale that illustrates loudness associated with common noise levels.

The “Project only” noise projections to the adjacent uses are above the measured ambient noise conditions.

Project Plus Ambient Operational Noise Levels

Table 2 demonstrates the Project plus the ambient noise levels. Project plus ambient noise level projections are anticipated to range between 57 to 63 dBA Leq at commercial receptors.

Table 2: Worst-Case Predicted Operational Noise Levels (dBA)

Receptor ¹	Existing Ambient Noise Level (dBA, Leq) ²	Project Noise Level (dBA, Leq) ³	Total Combined Noise Level (dBA, Leq)	Anytime Commercial Noise Limit (dBA, Leq)	Change in Noise Level as Result of Project
1	57	62	63	70	6.2
2	57	59	61	70	4.1
3	57	56	60	70	2.5
4	57	35	57	70	0.0
Notes: ¹ Receptor 1-4 represents commercial uses properties.. ² See Appendix A for the ambient noise measurements. 57 dBA represents the average between both measurements ³ See Exhibit F for the operational noise level projections at said receptors.					

As shown in Table 2, the project does not exceed the City's commercial exterior noise limit. The project was compared to the existing measured baseline condition to the operational plus ambient noise condition to show the change in noise level. Table 2 provides the anticipated change in noise level as a Result of the proposed project. The existing noise levels are anticipated to have a noticeable increase Leq at the receptor locations analyzed. The noise level increase would be "Clearly noticeable" at the receptors.

Table 3 provides the characteristics associated with changes in noise levels.

Table 3: Change in Noise Level Characteristics¹

Changes in Intensity Level, dBA	Changes in Apparent Loudness
1	Not perceptible
3	Just perceptible
5	Clearly noticeable
10	Twice (or half) as loud

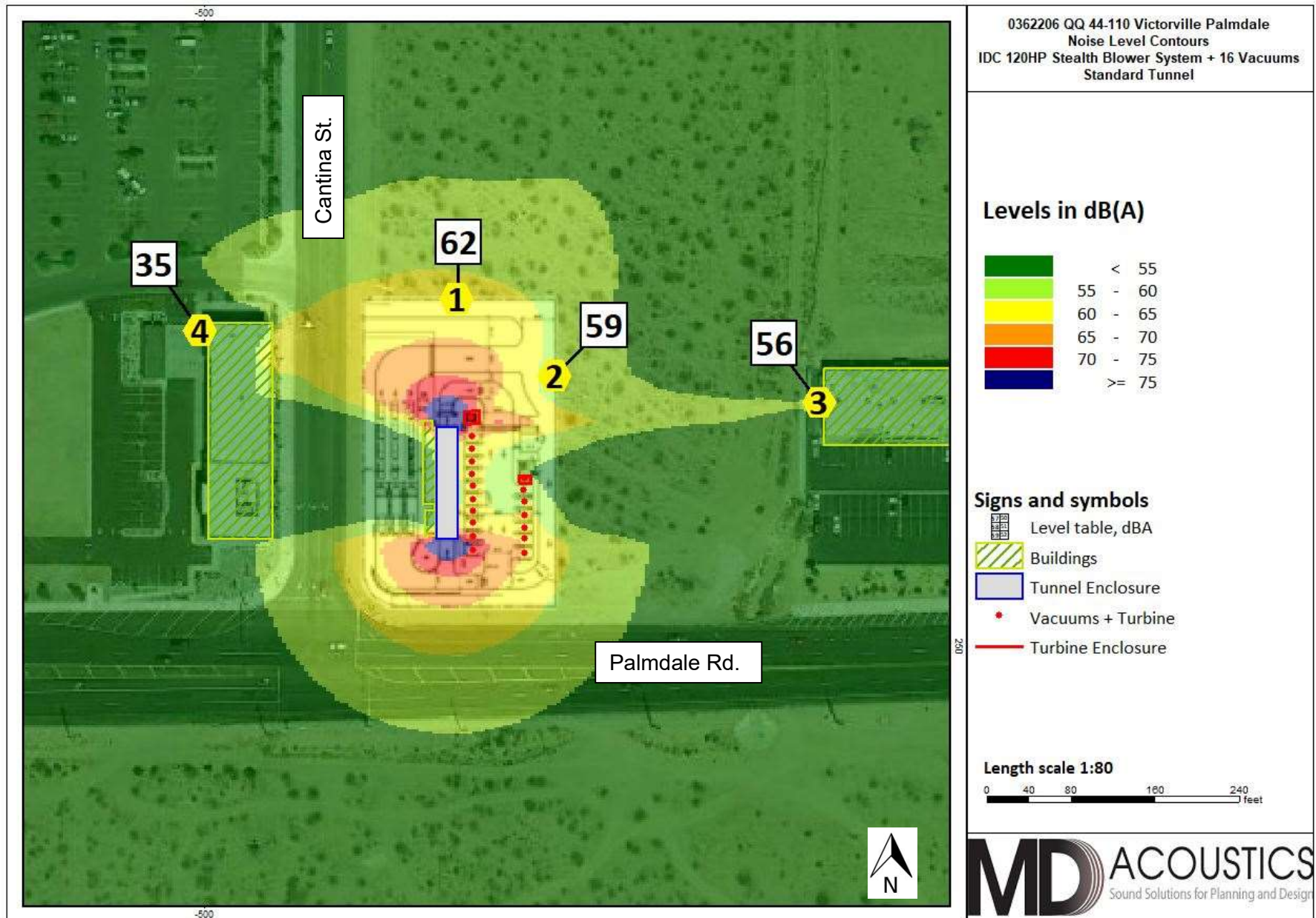
https://www.fhwa.dot.gov/environMent/noise/regulations_and_guidance/polguide/polguide02.cfm

7.2 Project Design Features

The following summarizes the Project design features (PDFs) for the Project:

1. The Project will incorporate an IDC 120HP Stealth Blower system or equivalent blower system to meet these acoustical benchmarks.
2. The Project proposes to house the vacuum turbine motors inside a 6' tall four sided CMU enclosure.

Exhibit F Operational Noise Levels Contours Leq(h)



8.0 References

Victorville Municipal Code: Chapter 13.01

Victorville General Plan, Noise Element, 2008

Governor's Office of Planning and Research. State of California General Plan Guidelines. 1998.

Federal Highway Administration. Noise Barrier Design Handbook. June 2017.

Federal Transit Administration. Transit Noise and Vibration Impact Assessment Manual. September 2018.

Appendix A:
Field Measurement Data

15-Minute Continuous Noise Measurement Datasheet

Project Name:	QQ 42-110 Palmdale & Cantina	Site Observations:
Project: #/Name:	0362-2022-006	Sunny with cloud cover, winds south to north at approx. 15 to 25 mph with occasional gusts, light to moderate traffic.
Site Address / Location:	intersection of Palmdale & C	Site Topo: flat
Date:	04/26/2022	Ground Type: Soft site
Field Tech / Engineer:	Dennis Jordan	Noise Source(s) w/ Distance:
Sound Meter:	XL2, NTI	SN: A2A-16164-E0 traffic to south 165 ft
Settings:	A-weighted, slow, 1-sec, 15-minute interval	Center of site traffic 320 ft
Meteorological Cond.:	74 degrees	
Site Id:	NM1, NM2	



15-Minute Continuous Noise Measurement Datasheet - Cont.

Project Name: QQ 42-110 Palmdale & Cantina

Site Address / Location: intersection of Palmdale & C

Site Id: NM1, NM2

Figure 1: NM1 Next to East Wall of PL



Figure 2: NM2 Center of site lot

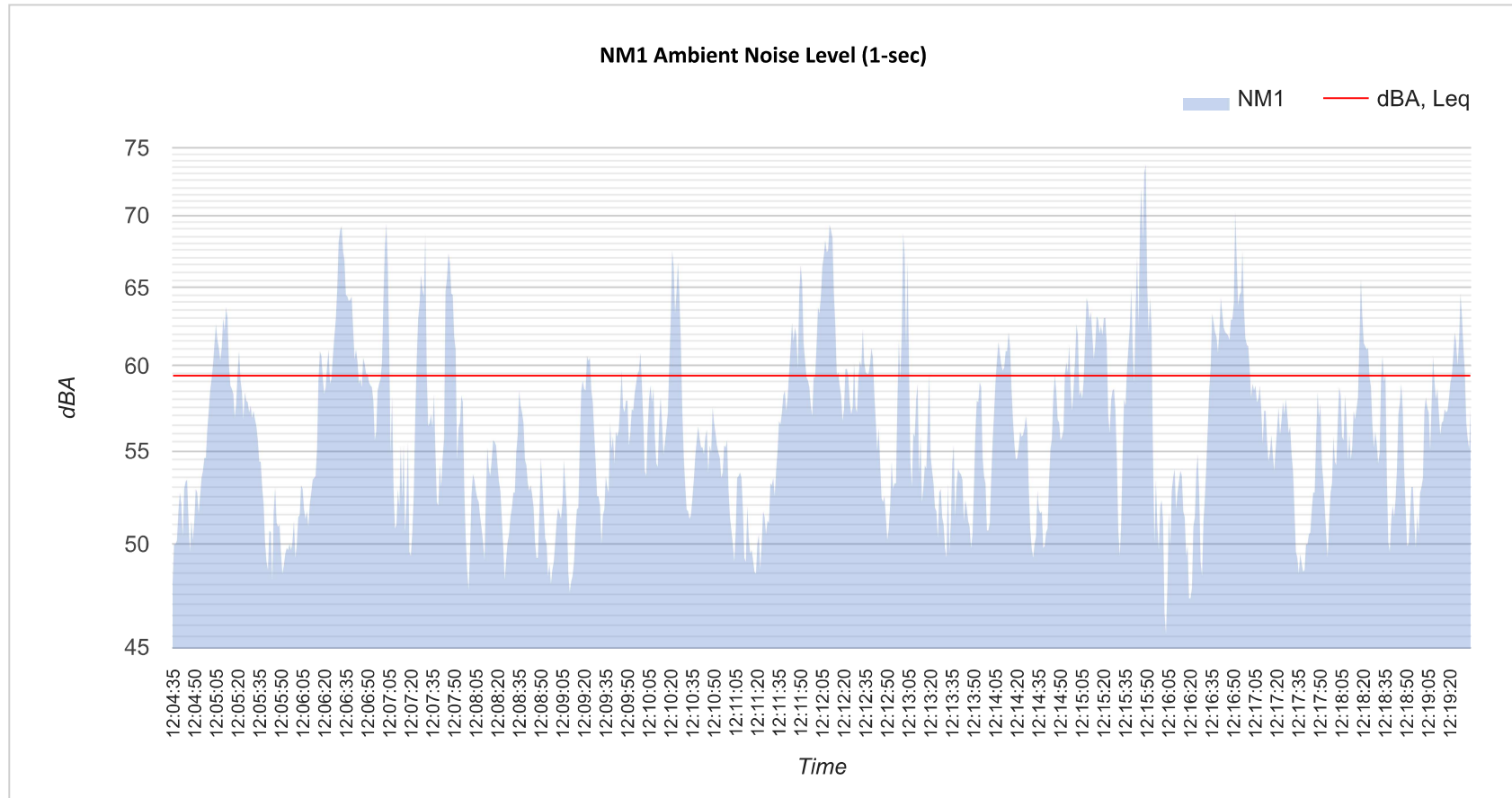


Table 1: Baseline Noise Measurement Summary

Location	Start	Stop	Leq	Lmax	Lmin	L2	L8	L25	L50	L90
NM1	12:04 PM	12:19 PM	59.4	73.4	46.9	67.5	63.4	59.4	55.9	50.1
NM2	12:24 PM	12:39 PM	55.2	75.0	45.4	63	57.4	53.4	51	47.5

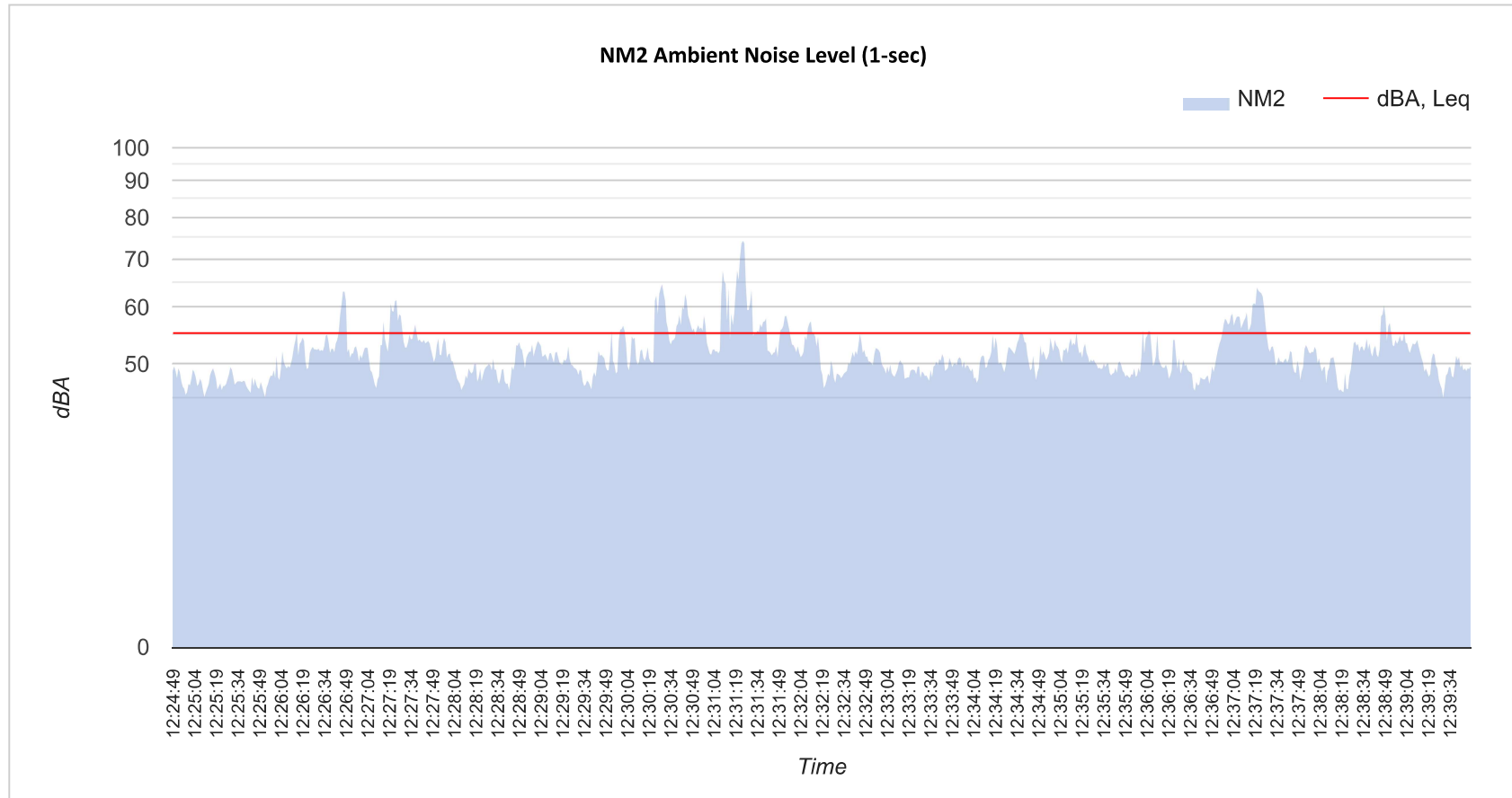
15-Minute Continuous Noise Measurement Datasheet - Cont.

Project Name: QQ 42-110 Palmdale & Cantina
Site Address / Location: intersection of Palmdale & C
Site Id: NM1



15-Minute Continuous Noise Measurement Datasheet - Cont.

Project Name: QQ 42-110 Palmdale & Cantina
Site Address / Location: intersection of Palmdale & C
Site Id: NM2



Appendix B:
SoundPLAN Input/Outputs

QQ 42-110 Victorville Palmdale
Contribution level - Situation 3 - IDC 120HP Stealth System -

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Source	Source ty	Leq,d dB(A)	A dB	
Receiver 1 FI G Lr,lim dB(A) Leq,d 61.7 dB(A) Sigma(Leq,d) 0.0 dB(A)				
Vacuum Turbine 1	Point	19.7	0.0	
Vacuum Turbine 2	Point	15.0	0.0	
Vacuum 1	Point	22.6	0.0	
Vacuum 2	Point	23.5	0.0	
Vacuum 3	Point	23.7	0.0	
Vacuum 4	Point	23.6	0.0	
Vacuum 5	Point	23.2	0.0	
Vacuum 6	Point	22.8	0.0	
Vacuum 7	Point	22.7	0.0	
Vacuum 8	Point	22.4	0.0	
Vacuum 9	Point	22.1	0.0	
Vacuum 10	Point	21.6	0.0	
Vacuum 11	Point	20.1	0.0	
Vacuum 12	Point	25.4	0.0	
Vacuum 13	Point	24.8	0.0	
Vacuum 14	Point	24.4	0.0	
Vacuum 15	Point	23.9	0.0	
Vacuum 16	Point	23.4	0.0	
Roof 01	Area	9.7	0.0	
Facade 01	Area	-5.3	0.0	
Transmissive area 01	Area	33.4	0.0	
Facade 02	Area	13.6	0.0	
Facade 03	Area	10.2	0.0	
Transmissive area 01	Area	61.7	0.0	
Facade 04	Area	13.2	0.0	
Receiver 2 FI G Lr,lim dB(A) Leq,d 59.3 dB(A) Sigma(Leq,d) 0.0 dB(A)				
Vacuum Turbine 1	Point	22.0	0.0	
Vacuum Turbine 2	Point	20.0	0.0	
Vacuum 1	Point	33.0	0.0	
Vacuum 2	Point	33.7	0.0	
Vacuum 3	Point	33.0	0.0	
Vacuum 4	Point	32.4	0.0	
Vacuum 5	Point	31.7	0.0	
Vacuum 6	Point	31.0	0.0	
Vacuum 7	Point	30.6	0.0	
Vacuum 8	Point	29.9	0.0	
Vacuum 9	Point	29.0	0.0	
Vacuum 10	Point	28.4	0.0	
Vacuum 11	Point	27.0	0.0	
Vacuum 12	Point	28.4	0.0	
Vacuum 13	Point	30.3	0.0	
Vacuum 14	Point	29.5	0.0	
Vacuum 15	Point	28.9	0.0	

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QQ 42-110 Victorville Palmdale
Contribution level - Situation 3 - IDC 120HP Stealth System -

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Source	Source ty	Leq,d dB(A)	A dB	
Vacuum 16	Point	28.1	0.0	
Roof 01	Area	11.8	0.0	
Facade 01	Area	-1.8	0.0	
Transmissive area 01	Area	38.4	0.0	
Facade 02	Area	19.1	0.0	
Facade 03	Area	9.8	0.0	
Transmissive area 01	Area	59.1	0.0	
Facade 04	Area	10.8	0.0	
Receiver 3 FI G Lr,lim dB(A) Leq,d 55.5 dB(A) Sigma(Leq,d) 0.0 dB(A)				
Vacuum Turbine 1	Point	13.9	0.0	
Vacuum Turbine 2	Point	13.9	0.0	
Vacuum 1	Point	25.2	0.0	
Vacuum 2	Point	25.2	0.0	
Vacuum 3	Point	25.1	0.0	
Vacuum 4	Point	25.1	0.0	
Vacuum 5	Point	24.0	0.0	
Vacuum 6	Point	23.5	0.0	
Vacuum 7	Point	24.8	0.0	
Vacuum 8	Point	24.7	0.0	
Vacuum 9	Point	24.6	0.0	
Vacuum 10	Point	22.4	0.0	
Vacuum 11	Point	25.2	0.0	
Vacuum 12	Point	25.1	0.0	
Vacuum 13	Point	24.2	0.0	
Vacuum 14	Point	24.9	0.0	
Vacuum 15	Point	24.7	0.0	
Vacuum 16	Point	24.6	0.0	
Roof 01	Area	6.1	0.0	
Facade 01	Area	-5.0	0.0	
Transmissive area 01	Area	38.0	0.0	
Facade 02	Area	12.6	0.0	
Facade 03	Area	3.1	0.0	
Transmissive area 01	Area	55.4	0.0	
Facade 04	Area	4.2	0.0	
Receiver 4 FI G Lr,lim dB(A) Leq,d 34.7 dB(A) Sigma(Leq,d) 0.0 dB(A)				
Vacuum Turbine 1	Point	3.2	0.0	
Vacuum Turbine 2	Point	0.7	0.0	
Vacuum 1	Point	2.9	0.0	
Vacuum 2	Point	2.3	0.0	
Vacuum 3	Point	1.9	0.0	
Vacuum 4	Point	1.6	0.0	
Vacuum 5	Point	1.4	0.0	
Vacuum 6	Point	1.1	0.0	
Vacuum 7	Point	0.9	0.0	

QQ 42-110 Victorville Palmdale
Contribution level - Situation 3 - IDC 120HP Stealth System -

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Source	Source ty	Leq,d dB(A)	A dB	
Vacuum 8	Point	0.7	0.0	
Vacuum 9	Point	0.5	0.0	
Vacuum 10	Point	0.7	0.0	
Vacuum 11	Point	1.7	0.0	
Vacuum 12	Point	1.4	0.0	
Vacuum 13	Point	1.1	0.0	
Vacuum 14	Point	0.9	0.0	
Vacuum 15	Point	1.0	0.0	
Vacuum 16	Point	0.8	0.0	
Roof 01	Area	-2.4	0.0	
Facade 01	Area	-15.7	0.0	
Transmissive area 01	Area	27.2	0.0	
Facade 02	Area	-4.6	0.0	
Facade 03	Area	-9.5	0.0	
Transmissive area 01	Area	33.9	0.0	
Facade 04	Area	-2.2	0.0	

QQ 42-110 Victorville Palmdale 3rd octave spectra of the sources in dB(A) - Situation 3 - IDC 120HP Stealth System - SP

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Name	I or A m,m²	Li dB(A)	R'w dB	L'w dB(A)	Lw dB(A)	25Hz dB(A)	31.5Hz dB(A)	40Hz dB(A)	50Hz dB(A)	63Hz dB(A)	80Hz dB(A)	100Hz dB(A)	125Hz dB(A)	160Hz dB(A)	200Hz dB(A)	250Hz dB(A)	315Hz dB(A)	400Hz dB(A)	500Hz dB(A)	630Hz dB(A)	800Hz dB(A)	1kHz dB(A)	1.25kHz dB(A)	1.6kHz dB(A)	2kHz dB(A)	2.5kHz dB(A)	3.15kHz dB(A)	4kHz dB(A)	5kHz dB(A)	6.3kHz dB(A)	8kHz dB(A)	10kHz dB(A)
Vacuum Turbine 1				64.2	64.2					64.2																						
Vacuum Turbine 2				64.2	64.2					64.2																						
Vacuum 1				73.8	73.8	32.2	35.2	42.2	46	49.2	53.2	55.2	56.2	59.2	64.2	65.2	61.2	59.2	63.2	57.2	59.2	60.2	58.2	61.2	61.2	61.2	61.2	61.2	59.2	58.2	55.2	52.2
Vacuum 2				73.8	73.8	32.2	35.2	42.2	46	49.2	53.2	55.2	56.2	59.2	64.2	65.2	61.2	59.2	63.2	57.2	59.2	60.2	58.2	61.2	61.2	61.2	61.2	61.2	59.2	58.2	55.2	52.2
Vacuum 3				73.8	73.8	32.2	35.2	42.2	46	49.2	53.2	55.2	56.2	59.2	64.2	65.2	61.2	59.2	63.2	57.2	59.2	60.2	58.2	61.2	61.2	61.2	61.2	61.2	59.2	58.2	55.2	52.2
Vacuum 4				73.8	73.8	32.2	35.2	42.2	46	49.2	53.2	55.2	56.2	59.2	64.2	65.2	61.2	59.2	63.2	57.2	59.2	60.2	58.2	61.2	61.2	61.2	61.2	61.2	59.2	58.2	55.2	52.2
Vacuum 5				73.8	73.8	32.2	35.2	42.2	46	49.2	53.2	55.2	56.2	59.2	64.2	65.2	61.2	59.2	63.2	57.2	59.2	60.2	58.2	61.2	61.2	61.2	61.2	61.2	59.2	58.2	55.2	52.2
Vacuum 6				73.8	73.8	32.2	35.2	42.2	46	49.2	53.2	55.2	56.2	59.2	64.2	65.2	61.2	59.2	63.2	57.2	59.2	60.2	58.2	61.2	61.2	61.2	61.2	61.2	59.2	58.2	55.2	52.2
Vacuum 7				73.8	73.8	32.2	35.2	42.2	46	49.2	53.2	55.2	56.2	59.2	64.2	65.2	61.2	59.2	63.2	57.2	59.2	60.2	58.2	61.2	61.2	61.2	61.2	61.2	59.2	58.2	55.2	52.2
Vacuum 8				73.8	73.8	32.2	35.2	42.2	46	49.2	53.2	55.2	56.2	59.2	64.2	65.2	61.2	59.2	63.2	57.2	59.2	60.2	58.2	61.2	61.2	61.2	61.2	61.2	59.2	58.2	55.2	52.2
Vacuum 9				73.8	73.8	32.2	35.2	42.2	46	49.2	53.2	55.2	56.2	59.2	64.2	65.2	61.2	59.2	63.2	57.2	59.2	60.2	58.2	61.2	61.2	61.2	61.2	61.2	59.2	58.2	55.2	52.2
Vacuum 10				73.8	73.8	32.2	35.2	42.2	46	49.2	53.2	55.2	56.2	59.2	64.2	65.2	61.2	59.2	63.2	57.2	59.2	60.2	58.2	61.2	61.2	61.2	61.2	61.2	59.2	58.2	55.2	52.2
Vacuum 11				73.8	73.8	32.2	35.2	42.2	46	49.2	53.2	55.2	56.2	59.2	64.2	65.2	61.2	59.2	63.2	57.2	59.2	60.2	58.2	61.2	61.2	61.2	61.2	61.2	59.2	58.2	55.2	52.2
Vacuum 12				73.8	73.8	32.2	35.2	42.2	46	49.2	53.2	55.2	56.2	59.2	64.2	65.2	61.2	59.2	63.2	57.2	59.2	60.2	58.2	61.2	61.2	61.2	61.2	61.2	59.2	58.2	55.2	52.2
Vacuum 13				73.8	73.8	32.2	35.2	42.2	46	49.2	53.2	55.2	56.2	59.2	64.2	65.2	61.2	59.2	63.2	57.2	59.2	60.2	58.2	61.2	61.2	61.2	61.2	61.2	59.2	58.2	55.2	52.2
Vacuum 14				73.8	73.8	32.2	35.2	42.2	46	49.2	53.2	55.2	56.2	59.2	64.2	65.2	61.2	59.2	63.2	57.2	59.2	60.2	58.2	61.2	61.2	61.2	61.2	61.2	59.2	58.2	55.2	52.2
Vacuum 15				73.8	73.8	32.2	35.2	42.2	46	49.2	53.2	55.2	56.2	59.2	64.2	65.2	61.2	59.2	63.2	57.2	59.2	60.2	58.2	61.2	61.2	61.2	61.2	61.2	59.2	58.2	55.2	52.2
Vacuum 16				73.8	73.8	32.2	35.2	42.2	46	49.2	53.2	55.2	56.2	59.2	64.2	65.2	61.2	59.2	63.2	57.2	59.2	60.2	58.2	61.2	61.2	61.2	61.2	61.2	59.2	58.2	55.2	52.2
Roof 01	193.80	88.0	57.0	36.5	59.4					53.0			44.1			53.5			55.8			43.9			37.1			29.0			21.3	
Facade 01	20.42	87.2	57.0	35.7	48.8					42.4			33.5			43.0			45.2			33.4			26.6			18.3			9.3	
Transmissive area 01	15.58	87.0	0.0	87.0	99.0					71.1			76.1			87.6			95.8			93.1			90.3			85.1			74.0	
Facade 02	193.80	88.0	57.0	36.5	59.3					53.0			44.1			53.5			55.8			43.9			37.1			29.0			21.1	
Facade 03	20.42	88.1	57.0	36.2	49.3					42.9			34.0			43.5			45.8			34.3			28.0			20.3			14.1	
Transmissive area 01	15.58	89.4	0.0	89.4	101.3					72.8			77.9			89.4			97.7			95.5			93.3			88.8			80.9	
Facade 04	193.80	88.0	57.0	36.5	59.3					53.0			44.1			53.5			55.8			43.9			37.1			29.0			21.1	

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QQ 42-110 Victorville Palmdale **Contribution spectra - Situation 3 - IDC 120HP Stealth System -**

Source	Time slice	Sum dB(A)	63Hz dB(A)	125Hz dB(A)	250Hz dB(A)	500Hz dB(A)	1kHz dB(A)	2kHz dB(A)	4kHz dB(A)	8kHz dB(A)	16kHz dB(A)
Receiver 1 FI G Lr,lim dB(A) Leq,d 61.7 dB(A) Sigma(Leq,d) 0.0 dB(A)											
Facade 01	Leq,d	-5.3	-6.1	-21.4	-16.9	-16.8	-29.4				
Facade 02	Leq,d	13.6	10.7	-1.4	4.9	8.1	-2.0	-8.4	-17.9	-29.9	
Facade 03	Leq,d	10.2	6.5	-5.2	2.2	5.6	-4.1	-10.3	-19.0	-28.5	
Facade 04	Leq,d	13.2	9.8	-1.3	5.6	8.1	-2.8	-10.3	-20.1		
Roof 01	Leq,d	9.7	6.0	-6.2	2.8	4.6	-6.5	-14.2	-25.2		
Transmissive area 01	Leq,d	61.7	36.4	39.1	47.1	56.6	57.0	55.3	49.7	38.4	
Transmissive area 01	Leq,d	33.4	20.2	18.5	23.1	29.8	27.6	24.2	16.4	-1.2	
Vacuum 1	Leq,d	22.6	13.7	16.0	18.5	12.5	10.4	11.2	6.6	-5.1	-23.5
Vacuum 2	Leq,d	23.5	13.4	16.4	19.3	13.9	12.2	13.4	8.9	-2.9	-23.1
Vacuum 3	Leq,d	23.7	13.0	16.3	19.3	14.3	13.1	14.2	9.8	-1.7	-22.3
Vacuum 4	Leq,d	23.6	12.4	15.9	18.9	14.4	13.4	14.9	10.6	-0.7	-21.7
Vacuum 5	Leq,d	23.2	11.9	15.5	18.1	14.2	13.3	15.2	11.0	-0.6	-22.2
Vacuum 6	Leq,d	22.8	11.4	15.0	17.3	13.9	13.4	15.0	11.1	0.1	-21.9
Vacuum 7	Leq,d	22.7	10.9	14.6	16.6	13.6	13.5	15.6	11.8	0.8	-21.5
Vacuum 8	Leq,d	22.4	10.4	14.1	16.0	13.2	13.3	15.7	12.1	1.2	-21.5
Vacuum 9	Leq,d	22.1	9.9	13.6	15.3	12.6	13.1	15.6	12.2	1.4	-21.5
Vacuum 10	Leq,d	21.6	9.5	13.2	14.7	11.9	12.8	15.1	12.1	1.8	-21.1
Vacuum 11	Leq,d	20.1	11.8	12.8	14.6	9.2	9.7	11.9	7.2	-6.0	-28.9
Vacuum 12	Leq,d	25.4	11.3	15.7	16.5	13.8	17.3	20.1	18.0	9.0	-11.1
Vacuum 13	Leq,d	24.8	10.8	15.2	15.9	13.1	16.7	19.5	17.3	8.2	-12.6
Vacuum 14	Leq,d	24.4	10.4	14.7	15.3	12.5	16.3	19.2	16.9	7.5	-13.9
Vacuum 15	Leq,d	23.9	10.0	14.3	14.7	12.0	15.9	18.8	16.4	6.8	-15.1
Vacuum 16	Leq,d	23.4	9.6	13.9	14.1	11.4	15.4	18.4	15.9	6.0	-16.6
Vacuum Turbine 1	Leq,d	19.7	19.7								
Vacuum Turbine 2	Leq,d	15.0	15.0								
Receiver 2 FI G Lr,lim dB(A) Leq,d 59.3 dB(A) Sigma(Leq,d) 0.0 dB(A)											
Facade 01	Leq,d	-1.8	-3.2	-16.9	-11.2	-11.0	-23.7				
Facade 02	Leq,d	19.1	15.7	4.1	10.8	14.2	4.3	-2.4	-11.5	-22.8	
Facade 03	Leq,d	9.8	4.6	-7.0	2.3	6.1	-3.3	-9.6	-18.2	-27.5	
Facade 04	Leq,d	10.8	9.5	-4.6	1.5	1.4	-11.1	-19.0	-28.5		
Roof 01	Leq,d	11.8	8.1	-4.1	4.8	6.8	-4.1	-11.6	-22.1		
Transmissive area 01	Leq,d	59.1	36.3	36.8	45.6	53.5	54.8	52.7	47.1	35.7	
Transmissive area 01	Leq,d	38.4	23.7	23.8	29.1	35.2	32.3	27.8	19.5	2.4	
Vacuum 1	Leq,d	33.0	18.2	22.9	26.1	22.9	24.2	26.6	25.3	18.5	4.2
Vacuum 2	Leq,d	33.7	17.1	23.6	26.2	23.3	25.2	27.7	26.3	19.3	4.2
Vacuum 3	Leq,d	33.0	16.5	23.0	25.4	22.5	24.6	27.1	25.7	18.5	3.0
Vacuum 4	Leq,d	32.4	15.8	22.4	24.6	21.7	24.0	26.5	25.0	17.6	1.6
Vacuum 5	Leq,d	31.7	15.2	21.4	23.8	20.9	23.3	25.9	24.4	16.8	0.4
Vacuum 6	Leq,d	31.0	14.6	20.8	22.9	20.1	22.7	25.3	23.7	15.9	-1.1
Vacuum 7	Leq,d	30.6	14.0	20.3	22.3	19.4	22.2	25.0	23.7	15.6	-2.2
Vacuum 8	Leq,d	29.9	13.5	19.7	21.5	18.7	21.6	24.3	22.9	14.6	-3.6
Vacuum 9	Leq,d	29.0	12.9	18.6	20.8	18.0	21.0	23.6	21.8	13.5	-5.1
Vacuum 10	Leq,d	28.4	12.3	18.1	20.0	17.3	20.3	23.0	21.2	12.7	-6.5
Vacuum 11	Leq,d	27.0	16.5	17.1	19.9	16.7	18.3	20.5	18.2	9.4	-9.8
Vacuum 12	Leq,d	28.4	15.7	18.3	21.6	18.7	20.1	22.1	19.8	11.0	-7.7
Vacuum 13	Leq,d	30.3	14.9	19.4	21.6	19.6	22.3	24.8	23.2	15.4	-1.6
Vacuum 14	Leq,d	29.5	14.2	18.7	20.7	18.8	21.5	24.1	22.4	14.4	-3.1
Vacuum 15	Leq,d	28.9	13.6	18.1	19.9	18.0	20.9	23.6	21.8	13.6	-4.6
Vacuum 16	Leq,d	28.1	12.9	17.3	18.7	17.2	20.3	22.9	21.1	12.8	-6.2
Vacuum Turbine 1	Leq,d	22.0	22.0								
Vacuum Turbine 2	Leq,d	20.0	20.0								
Receiver 3 FI G Lr,lim dB(A) Leq,d 55.5 dB(A) Sigma(Leq,d) 0.0 dB(A)											

QQ 42-110 Victorville Palmdale

Contribution spectra - Situation 3 - IDC 120HP Stealth System -

Source	Time slice	Sum	63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz	16kHz
		dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)
Facade 01	Leq,d	-5.0	-6.6	-20.1	-14.3	-12.8	-24.3				
Facade 02	Leq,d	12.6	9.7	-2.5	2.8	7.3	-2.1	-9.0	-19.6		
Facade 03	Leq,d	3.1	-0.3	-12.7	-6.7	-1.6	-9.1	-15.7	-26.0		
Facade 04	Leq,d	4.2	3.1	-11.3	-5.4	-6.7	-20.2	-28.6			
Roof 01	Leq,d	6.1	2.1	-10.0	-0.7	1.4	-9.7	-16.8	-27.7		
Transmissive area 01	Leq,d	55.4	29.8	31.9	37.3	48.5	52.0	49.6	42.5	25.2	
Transmissive area 01	Leq,d	38.0	21.2	21.8	27.0	34.6	32.9	28.2	17.9	-4.8	
Vacuum 1	Leq,d	25.2	11.9	16.3	15.9	13.2	17.4	20.1	17.3	6.1	-21.4
Vacuum 2	Leq,d	25.2	11.9	16.3	15.8	13.1	17.4	20.0	17.2	6.0	-21.6
Vacuum 3	Leq,d	25.1	11.9	16.2	15.8	13.1	17.3	20.0	17.2	5.9	-21.8
Vacuum 4	Leq,d	25.1	11.8	16.2	15.7	13.0	17.3	19.9	17.1	5.8	-22.0
Vacuum 5	Leq,d	24.0	8.7	14.9	15.6	12.8	15.2	19.0	16.0	4.0	-25.3
Vacuum 6	Leq,d	23.5	10.2	14.6	15.5	12.8	15.4	17.8	14.9	3.7	-24.0
Vacuum 7	Leq,d	24.8	10.1	16.0	15.5	12.8	17.1	19.7	16.8	5.5	-22.8
Vacuum 8	Leq,d	24.7	10.0	15.9	15.4	12.7	17.0	19.6	16.7	5.3	-23.2
Vacuum 9	Leq,d	24.6	10.0	15.8	15.2	12.6	16.9	19.5	16.6	5.1	-23.6
Vacuum 10	Leq,d	22.4	9.9	13.4	12.9	10.2	14.6	17.2	14.3	2.9	-25.6
Vacuum 11	Leq,d	25.2	11.1	15.1	15.2	13.6	17.7	20.3	17.6	6.9	-18.7
Vacuum 12	Leq,d	25.1	11.1	15.0	15.0	13.5	17.6	20.2	17.5	6.7	-19.0
Vacuum 13	Leq,d	24.2	11.0	14.9	14.7	13.3	16.4	19.0	16.3	5.8	-19.7
Vacuum 14	Leq,d	24.9	10.9	14.8	14.5	13.2	17.4	20.0	17.3	6.3	-19.9
Vacuum 15	Leq,d	24.7	10.8	14.6	14.4	13.1	17.3	19.9	17.1	6.1	-20.3
Vacuum 16	Leq,d	24.6	10.7	14.5	14.2	12.9	17.2	19.8	17.0	5.8	-21.0
Vacuum Turbine 1	Leq,d	13.9	13.9								
Vacuum Turbine 2	Leq,d	13.9	13.9								
Receiver 4 Fl G Lr,lim dB(A) Leq,d 34.7 dB(A) Sigma(Leq,d) 0.0 dB(A)											
Facade 01	Leq,d	-15.8	-16.6		-26.4	-26.4					
Facade 02	Leq,d	-4.6	-5.6	-20.9	-15.8	-15.0	-26.6				
Facade 03	Leq,d	-9.5	-10.1	-26.0	-21.6	-21.9					
Facade 04	Leq,d	-2.2	-3.2	-18.5	-13.0	-12.7	-24.3				
Roof 01	Leq,d	-2.4	-3.8	-18.2	-11.6	-12.2	-24.9				
Transmissive area 01	Leq,d	33.9	19.8	18.3	23.6	29.3	28.5	26.0	19.2	4.4	
Transmissive area 01	Leq,d	27.2	10.6	9.3	16.0	23.8	21.6	18.5	10.9	-8.0	
Vacuum 1	Leq,d	2.9	-4.7	-3.8	-2.8	-8.2	-9.0	-6.8	-9.8	-20.2	
Vacuum 2	Leq,d	2.3	-5.4	-4.5	-3.2	-8.6	-9.5	-7.2	-10.1	-20.5	
Vacuum 3	Leq,d	1.9	-5.9	-5.1	-3.5	-9.0	-9.9	-7.4	-10.4	-20.8	
Vacuum 4	Leq,d	1.6	-6.4	-5.6	-3.8	-9.2	-10.2	-7.7	-10.6	-21.1	
Vacuum 5	Leq,d	1.4	-6.6	-5.9	-3.9	-9.5	-10.5	-7.8	-10.8	-21.5	
Vacuum 6	Leq,d	1.1	-6.9	-6.2	-4.1	-9.7	-10.8	-8.1	-11.1	-21.8	
Vacuum 7	Leq,d	0.9	-7.1	-6.4	-4.3	-9.9	-11.0	-8.5	-11.4	-22.1	
Vacuum 8	Leq,d	0.7	-7.3	-6.6	-4.4	-10.1	-11.3	-8.9	-11.7	-22.5	
Vacuum 9	Leq,d	0.5	-7.4	-6.8	-4.6	-10.3	-11.5	-9.2	-12.0	-22.9	
Vacuum 10	Leq,d	0.7	-7.0	-6.4	-4.5	-10.3	-11.3	-9.2	-12.1	-23.2	
Vacuum 11	Leq,d	1.7	-5.6	-5.1	-3.4	-9.7	-11.1	-8.7	-12.1	-23.6	
Vacuum 12	Leq,d	1.4	-5.9	-5.4	-3.6	-9.9	-11.5	-9.2	-12.5	-23.9	
Vacuum 13	Leq,d	1.1	-6.2	-5.7	-3.8	-10.1	-11.8	-9.5	-12.7	-24.3	
Vacuum 14	Leq,d	0.9	-6.5	-6.0	-3.9	-10.3	-12.0	-9.9	-13.0	-24.6	
Vacuum 15	Leq,d	1.0	-6.3	-5.8	-3.9	-10.3	-11.9	-9.9	-13.1	-24.8	
Vacuum 16	Leq,d	0.8	-6.5	-6.0	-4.1	-10.4	-12.1	-10.1	-13.3	-25.1	
Vacuum Turbine 1	Leq,d	3.2	3.2								
Vacuum Turbine 2	Leq,d	0.7	0.7								

Appendix C:
Equipment Reference Data



SOUND LEVEL METER READINGS

MODEL: FT-DD-T340HP4 (40hp VACSTAR TURBINE VACUUM PRODUCER)

READING ONE: 73 DB-A, 3 FEET FROM TURBINE @ 45° ANGLE
AND NO BACKGROUND NOISE OR OUTSIDE INTERFERENCE.

READING TWO: 69 DB-A, 10 FEET FROM TURBINE @ 45° ANGLE
AND NO BACKGROUND NOISE OR OUTSIDE INTERFERENCE.

READING THREE: 54 DB-A, 20 FEET FROM TURBINE @ 45° ANGLE
AND NO BACKGROUND NOISE OR OUTSIDE INTERFERENCE.

READING FOUR: 38 DB-A, 30 FEET FROM TURBINE @ 45° ANGLE
AND NO BACKGROUND NOISE OR OUTSIDE INTERFERENCE.

NOTE: THESE READINGS WERE TAKEN OUTSIDE IN THE OPEN ON A CONCRETE SLAB.

SOUND LEVEL METER USED:

SIMPSON MODEL #40003 – MSHA APPROVED.
MEETS OSHA & WALSH-HEALY REQUIREMENTS FOR NOISE CONTROL.
CONFORMS TO ANSI S1.4-1983, IEC 651 SPECS FOR METER TYPE.

Vacutech
1350 Hi-Tech Drive, Sheridan WY, 82801
PHONE: (800) 917-9444 FAX: (303) 675-1988
EMAIL: info@vacutechllc
WEB SITE: vacutechllc.com

Project: SuperStar Car Wash Chula Vista
Site Location: 1555 W Warner Rd, Gilbert, AZ 85233
Date: 4/5/2018
Field Tech/Engineer: Robert Pearson
Source/System: Vacutec System

Location: Vac Bay 1
Sound Meter: NTi XL2 **SN:** A2A-05967-E0
Settings: Z-weighted, slow, 1-sec, 10-sec duration
Meteorological Cond.: 80 degrees F, 2 mph wind

Site Observations:

Clear sky, measurements were performed within 1.5ft of source. Measurements were performed while the vacuum was positioned at threee (3) different positions. Holstered, unholstered and inside a car. This data is utilized for acoustic modeling purposes and represents an average sound level at a vacuum station.

Table 1: Summary Measurement Data

Source	System	Overall dB(A)	3rd Octave Band Data (dBA)																														
			20	25	31.5	40	50	63	80	100	125	160	200	250	315	400	500	630	800	1K	1.25K	1.6K	2K	2.5K	3.15K	4K	5K	6.3K	8K	10K	12.5K	16K	20K
Vacutech (Holstered)	Vacuum	63.3	9	17	22	29	31	35	40	41	44	43	46	48	47	49	51	51	52	53	52	52	50	52	53	50	47	47	48	45	39	30	
Vacutech (Un Holstered)	Vacuum	80.7	6	19	22	28	34	37	40	43	47	46	48	48	48	49	54	55	58	62	65	68	70	74	75	73	69	67	65	63	60	55	
Vacutech (Inside Car)	Vacuum	69.6	16	28	31	38	42	45	49	51	52	55	60	61	57	55	59	53	55	56	54	57	57	57	57	55	54	51	48	46	42	36	
Arth. Average Level*	Vacuum	71.2	11	21	25	32	36	39	43	45	47	48	52	53	51	51	55	53	55	55	56	58	59	59	61	62	59	56	55	53	51	47	40

* Refers to the arithmetic average of all measurements. This measurement represents an average of the multiple vacuum positions.

Figure 1: Example Measurement Position

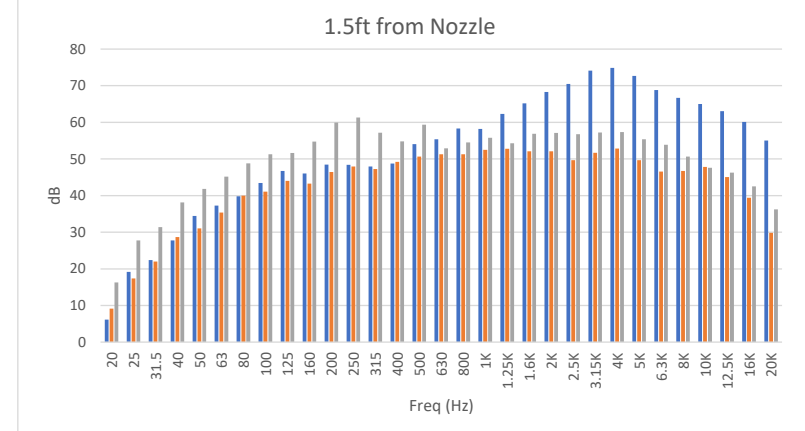
Figure 1: Holstered



Figure 2: Un Holstered



Figure 3: Inside Car



Stealth High Powered Quiet Drying System Specifications

30 HP System		80 HP System	
Total Sound		Total Sound	
60 Hz Results		60 Hz Results	
84.2	dBA at Q=1, 5 feet	89.362	dBA at Q=1, 5 feet
78.2	dBA at Q=1, 10 feet	83.34	dBA at Q=1, 10 feet
74.7	dBA at Q=1, 15 feet	79.82	dBA at Q=1, 15 feet
72.2	dBA at Q=1, 20 feet	77.32	dBA at Q=1, 20 feet
70.2	dBA at Q=1, 25 feet	75.38	dBA at Q=1, 25 feet
68.7	dBA at Q=1, 30 feet	73.79	dBA at Q=1, 30 feet
67.3	dBA at Q=1, 35 feet	72.46	dBA at Q=1, 35 feet
66.2	dBA at Q=1, 40 feet	71.3	dBA at Q=1, 40 feet
65.1	dBA at Q=1, 45 feet	70.27	dBA at Q=1, 45 feet
64.2	dBA at Q=1, 50 feet	69.36	dBA at Q=1, 50 feet
63.4	dBA at Q=1, 55 feet	68.53	dBA at Q=1, 55 feet