May 9, 2023

Paul Bajwa
4261 Elkhorn Boulevard
North Highlands, CA 95835

Transmitted via email: lburnside@barghausen.com

Subject: Analysis of noise levels associated with on-site operations during nighttime hours at the ARCO AM/PM Larchmont Village located in Sacramento County, California.

Dear Paul,

Pursuant to your request, Bollard Acoustical Consultants, Inc. (BAC) has completed an analysis of noise levels associated with on-site operations during the hours of 11:00 p.m. to 6:00 a.m. at the ARCO AM/PM Larchmont Village (project) in Sacramento County, California. Specifically, the following letter summarizes expected noise levels associated with project on-site operations during the aforementioned hours relative to compliance with applicable Sacramento County nighttime noise level criteria. The project site location with aerial imagery is shown in Attachment A. The project preliminary site plan is presented in Attachment B.

Criteria for Acceptable Noise Exposure

Sacramento County General Plan

The Sacramento County General Plan serves as the overall guiding policy document for land use, development, and environmental quality for the County. The Noise Element of the General Plan contains noise standards for transportation as well as non-transportation or "stationary" noise sources. The non-transportation criteria, shown in Table 1, would be applicable to project-generated on-site operations noise sources.

Sacramento County Municipal Code

Section 6.68 of the Sacramento County Code (noise control) establishes standards for acceptable noise exposure at residential uses. Because the County's Noise Ordinance standards are consistent with the County's General Plan standards, compliance with the Table 1 standards would ensure satisfaction of both the General Plan and Noise Ordinance standards.

Table 1
Non-Transportation Noise Standards – Median (L_{50}) / Maximum (L_{max})[1]

Receiving Land Use	Outdoor Areas[2]		Interior Areas[3]	Notes
	Daytime	Nighttime	Day & Night	
Residential	55 / 75	50 / 70	35 / 55	
Transient lodging	55 / 75	--	35 / 55	4
Hospitals, nursing homes	55 / 75	--	35 / 55	5, 6
Theaters & auditoriums	--	--	30 / 50	6
Churches, schools, libraries	55 / 75	--	35 / 60	6
Office buildings	60 / 75	--	45 / 65	6
Commercial buildings	--	--	45 / 65	6
Playgrounds, parks	65 / 75	--	--	6
Industry	60 / 80	--	50 / 70	6

[1] The Table 1 standards shall be reduced by 5 dB for sounds consisting primarily of speech or music, and for recurring impulsive sounds. If the existing ambient noise level exceeds the standards of Table 1, then the noise level standards shall be increased at 5 dB increments to encompass the ambient.

[2] Sensitive areas are defined in the acoustic terminology section.

[3] Interior noise level standards are applied within the noise-sensitive areas of the various land uses, with windows and doors in the closed positions.

[4] Outdoor activity areas of transient lodging facilities area not commonly used during nighttime hours.

[5] Hospitals are often noise-generating uses. The exterior noise level standards for hospitals are applicable only at clearly identified areas designated for outdoor relaxation by either hospital staff or patients.

[6] The outdoor activity areas of these uses (if any) are not typically utilized during nighttime hours.

[7] Where median (L50) noise level data is not available for a particular noise source, average (Leq) values may be substituted for the standards of this table provided the noise source in question operates for at least 30 minutes of an hour. If the source in question operates less than 30 minutes per hour, then the maximum noise level standards shown would apply.

Source: Sacramento County General Plan, Noise Element, Table 2.

The nearest noise-sensitive uses have been identified as residential to the west of the project, shown in Attachment A. The City's noise level criteria for residential uses shown in Table 1 were applied to project on-site operations noise sources and assessed at the closest residential uses to the west.

Project Noise Generation

It is the understanding of BAC that current hours of operations for the project are 6:00 a.m. to 11:00 p.m. This letter summarizes expected noise levels associated with project-generated on-site operations during the hours of 11:00 p.m. to 6:00 a.m. The primary noise sources associated with project on-site operations have been identified as on-site vehicle circulation, parking lot movements, air/water unit, and rooftop-mounted mechanical equipment (HVAC). It is the understanding of BAC that truck deliveries to the project site (i.e., deliveries of c-store products and fuel) will not occur during hours of 11:00 p.m. to 6:00 a.m. As a result, an analysis of project truck delivery activity noise was not included in this memorandum.

To quantify noise level exposure from the identified on-site operations, BAC utilized file data obtained from measurements conducted by BAC for similar projects in recent years. BAC reference sound level data for the identified on-site operations noise sources are summarized below in Table 2.

Table 2
Reference Noise Level Data for On-Site Operations

Noise Source	Sound Exposure Level, SEL (dB)	Median Noise Level, L_{50} (dB)	Maximum Noise Level, L_{max} (dB)	Distance (ft)
On-Site Vehicle Circulation	70	*Hourly Operations Dependent*[1]	65	50
Parking Lot Movements	70	*Hourly Operations Dependent*[1]	70	50
Air/Water Unit	--	65	--	10
HVAC	--	45	--	100

[1] Reference median noise level calculated from # of operations within a given hour.

Source: Bollard Acoustical Consultants, Inc 2023.

To compute project on-site operations noise levels relative to the County's median (L_{50}) noise level criteria, the following noise source operations assumptions were utilized:

On-Site Vehicle Circulation & Parking Movements

According to the site plan shown in Attachment B, the project proposes 16 fuel canopy stalls and 6 parking spaces. Assuming each vehicle spends five minutes in either a parking or canopy stall, this would result in a total of approximately 264 vehicle trips to and from the site per hour at maximum capacity (i.e., peak hour, considered to be worst-case). It is reasonably assumed for the purposes of this analysis that peak hour vehicle trip generation would occur during daytime hours (7:00 a.m. to 10:00 p.m.), when project uses are typically the busiest. It is further assumed that peak hour project trip generation from 11:00 p.m. to 6:00 a.m., during nighttime hours, would be approximately 50% less than peak hour trips during daytime hours.

Based on the information above, the analysis of project on-site vehicle circulation and parking movement median (L_{50}) noise levels during the hours of 11:00 p.m. to 6:00 a.m. utilizes 132 vehicle trips (50% of 264).

Air/Water Unit

The analysis of project air/water unit median (L_{50}) noise levels during the hours of 11:00 p.m. to 6:00 a.m. conservatively assumes continuous equipment usage for the duration of an hour.

HVAC Equipment

The analysis of project HVAC equipment median (L_{50}) noise levels during the hours of 11:00 p.m. to 6:00 a.m. conservatively assumes continuous usage of the equipment for the duration of an hour.

Predicted Equipment Noise Levels at Nearest Residential Uses

Using the reference sound level data shown in Table 2, the outlined operations assumptions, the provided site plan for scaling distances, and assuming standard spherical spreading loss (-6 dB per doubling of distance), project on-site operations noise exposure at the property lines of the nearest residential uses to the west was calculated and the results of those calculations are presented in Tables 3 and 4.

The predicted noise levels presented in Tables 3 and 4 include consideration of attenuation that would be provided by an existing 6' CMU wall constructed along the western project property boundary. The existing noise barrier, which is illustrated in Attachment B, is calculated to provide approximately 6 dB of project noise attenuation at the adjacent residential uses to the west.

Table 3
Project Operations Median L_{50} Noise at Residential Uses – 11:00 a.m. to 6:00 a.m.

	Predicted Noise Level, L_{50} (dB)[2]				
Receiver[1]	Vehicle Circulation[3]	Parking Movements[4]	Air/Water Unit[5]	HVAC[6]	County Exterior Nighttime Noise Limit, L_{50} (dB)
Nearest Residential – West	50	48	39	49	**50**

[1] Residential uses shown in Attachment A.
[2] Predicted noise levels include an offset of -6 dB to account for attenuation provided by an existing 6' noise barrier.
[3] Predicted on-site vehicle circulation noise level utilizes 130 vehicle trips an hour.
[4] Predicted parking movement noise level utilizes 130 vehicle trips an hour.
[5] Predicted air/water unit noise level assumes continuous operation for 30 minutes or more during a given hour.
[6] Predicted HVAC equipment noise level assumes continuous operation for 30 minutes or more during a given hour.

Source: Bollard Acoustical Consultants, Inc. 2023.

Table 4
Project Operations Maximum L_{max} Noise at Residential Uses – 11:00 a.m. to 6:00 a.m.

	Predicted Noise Level, L_{max} (dB)[2]				
Receiver[1]	Vehicle Circulation[3]	Parking Movements[4]	Air/Water Unit[5]	HVAC[6]	County Exterior Nighttime Noise Limit, L_{max} (dB)
Nearest Residential – West	59	67	--	--	**70**

[1] Residential uses shown in Attachment A.
[2] Predicted noise levels include an offset of -6 dB to account for attenuation provided by an existing 6' noise barrier.
[3] Predicted maximum noise level on-site vehicle circulation.
[4] Predicted maximum noise level parking movements.
[5] Because air/water unit could potentially in operation for 30 minutes or more during an hour, this noise source was quantified relative to County's median (L50) noise level limit.
[6] Because HVAC equipment could potentially in operation for 30 minutes or more during an hour, this noise source was quantified relative to County's median (L50) noise level limit.

Source: Bollard Acoustical Consultants, Inc. 2023.

As indicated in Tables 3 and 4, noise level exposure from analyzed on-site operations is predicted to satisfy the Sacramento County exterior nighttime median (L_{50}) and maximum (L_{max}) noise level standards for residential uses at the closest existing residential uses to the west. The predicted

compliance includes consideration of attenuation that would be provided by the existing CMU wall along the western project property boundary.

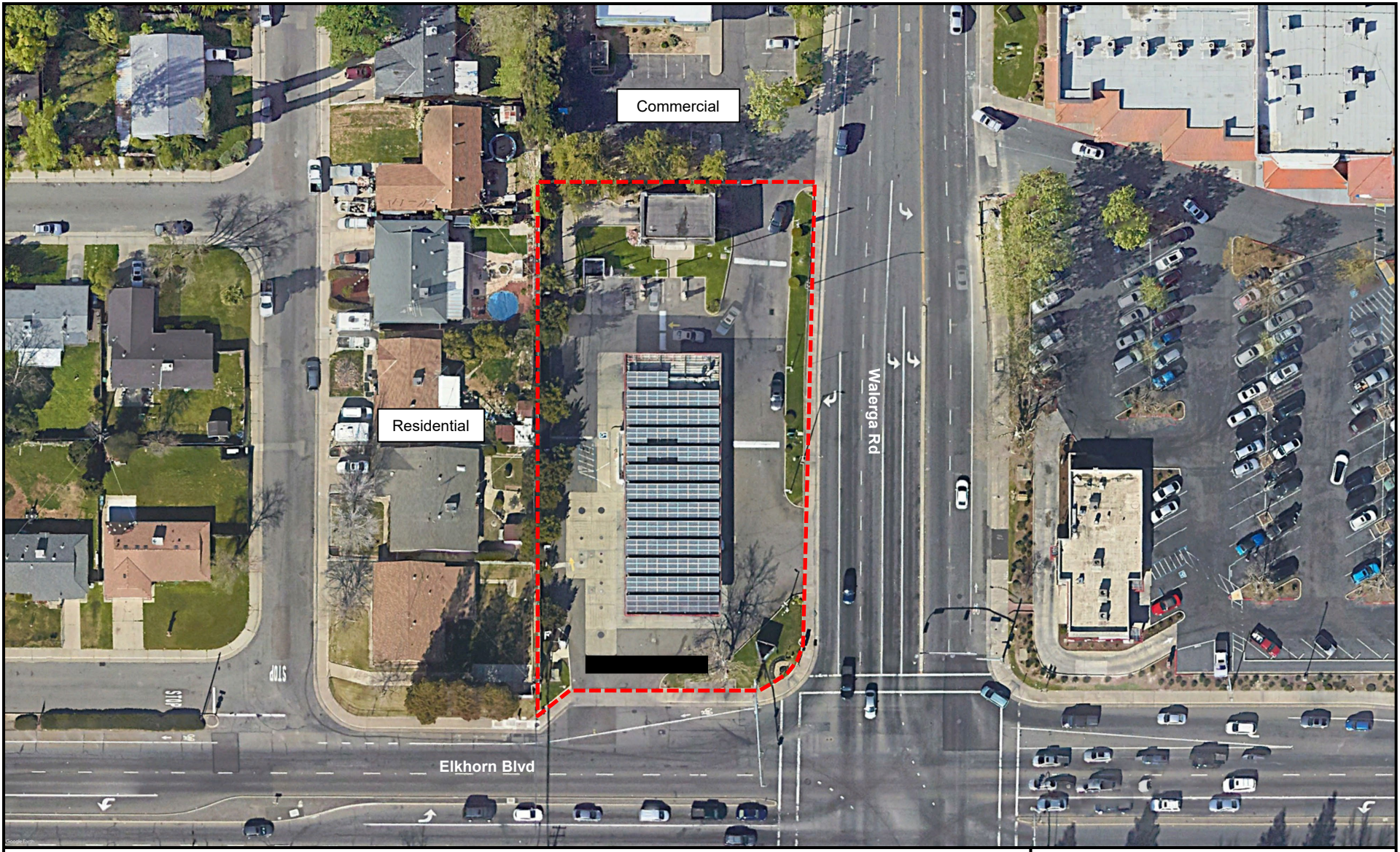
Standard residential construction (e.g., stucco siding, STC-27 windows, door weather-stripping, exterior wall insulation, composition plywood roof), typically results in an exterior to interior noise reduction of approximately 25 dB with windows closed and approximately 15 dB with windows open. Given the predicted exterior noise levels provided in Tables 3 and 4, and after consideration of the exterior to interior noise level reduction typically provided by standard residential construction (i.e., at least 25 dB with windows closed and approximately 15 dB with windows open), project on-site operations noise levels are also expected to comply with the County's interior day/night median and maximum noise level standards of 35 dB L_{50} and 55 dB L_{max} (respectively) within the closest residential uses to the west.

This concludes BAC's on-site operations noise analysis for the ARCO AM/PM Larchmont Village project in Sacramento County, California. Please contact us at (530) 537-2328 or info@bacnoise.com if you have any questions or require additional information.

Sincerely,

Bollard Acoustical Consultants, Inc.

Dario Gotchet, Principal Consultant



Legend

Project Parcel Boundary (Approximate)

N

Scale (Feet)

0 30 60

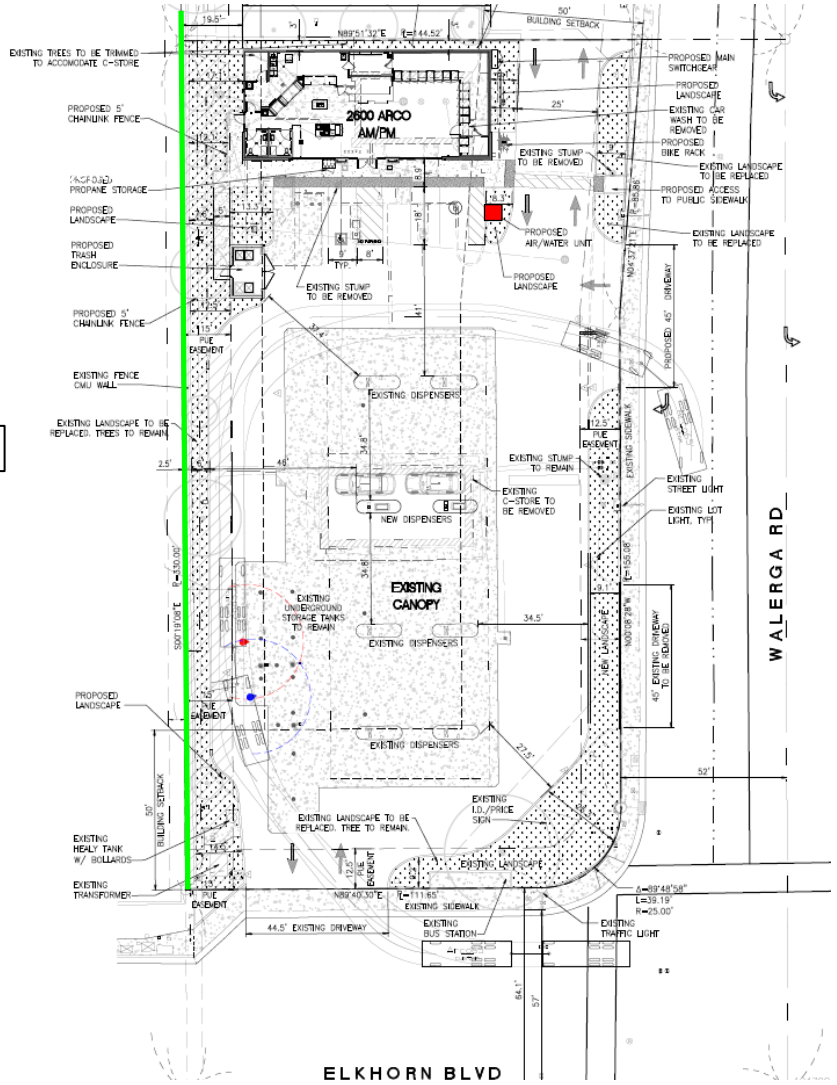
ARCO AM/PM Larchmont Village
Sacramento County, California

Project Area

Attachment A

BOLLARD Acoustical Consultants

Residential



Legend

- Existing 6' CMU Wall (Noise Barrier)
- Air/Water Unit

N

Scale (Feet)

0 20 40

ARCO AM/PM Larchmont Village
Sacramento County, California

Preliminary Site Plan

Attachment B

BOLLARD Acoustical Consultants