

**Delivered via Electronic Mail**

Tom Yu  
Silicon Valley Flourishing Inc  
14407 Big Basin Way, Ste E  
Saratoga, CA 95070  
[svflourishing@gmail.com](mailto:svflourishing@gmail.com)

**AIR QUALITY AND GREENHOUSE GAS EMISSIONS MEMORANDUM FOR  
640 LAKEHAVEN DRIVE, SUNNYVALE, CALIFORNIA**

Dear Mr. Yu:

January 19,, 2024

Ramboll Americas Engineering Solutions, Inc. ("Ramboll") conducted an analysis of the air quality and greenhouse gas (GHG) emissions impacts of the proposed residential development at 640 Lakehaven Drive in the City of Sunnyvale, California (the "Project"). The Project would construct six single-family home on a site of approximately 41,000 thousand square feet. The Project site is located approximately 40 feet north of a freeway (United States [US] 101) and separated by dense, mature vegetation. The Project site is adjacent to existing single-family homes to the east. The existing land uses in the Project's vicinity includes single-family and multi-family residences, recreational trails, and an elementary school.

Ramboll  
250 Montgomery Street  
Suite 1200  
San Francisco, CA 94104  
USA

T +1 415 796 1960  
[www.ramboll.com](http://www.ramboll.com)

The City requires the Project to provide an analysis that examines the effects of air quality conditions per Bay Area Air Quality Management District (BAAQMD) on future residents and the Project's GHG impacts on the surrounding neighborhood. This memorandum evaluates the air quality impacts on the Project's residents and the Project's GHG impacts in accordance with the City's requirements. The relevant guidelines, methodologies, and results are presented below.

**AIR QUALITY IMPACTS**

The BAAQMD updated the Air Quality California Environmental Quality Act Guidelines in April 2023, referred to as the "BAAQMD's Guidelines" hereafter.<sup>1</sup> The BAAQMD's Guidelines are intended to aid lead agencies in evaluating air quality and GHG-related impacts for CEQA purposes by providing advisory recommendations. The BAAQMD's Guidelines include procedures and guidance on evaluating project-level and plan-level impacts related to air pollutant emissions, health risks, generation of odors, and other topics. Specifically, BAAQMD recommends the following cumulative health risk screening levels:

---

<sup>1</sup> BAAQMD, 2023. 2022 CEQA Air Quality Guidelines. Available at: <https://www.baaqmd.gov/plans-and-climate/california-environmental-quality-act-ceqa/updated-ceqa-guidelines>. April.

<b>BAAQMD Health Risk Screening Thresholds</b>	
<b>Risks and Hazards for New Receptor</b>	<b>Cumulative Threshold</b>
Cancer Risk	Increased cancer risk of >100 in a million (from all local sources)
Hazard Index (HI)	Increased non-cancer risk of >10 HI (from all local sources) (chronic)
Ambient PM <sub>2.5</sub> Concentration	Ambient PM <sub>2.5</sub> increase: > 0.8 µg/m <sup>3</sup> annual average (from all local sources)
Abbreviations: HI = Hazard Index PM <sub>2.5</sub> = Particulate Matter less than 2.5 microns µg/m <sup>3</sup> = micrograms per cubic meter.  Reference: BAAQMD, 2023. CEQA Air Quality Guidelines. April.	

Although the impacts of the existing air quality conditions on the Project’s receptors are not considered a CEQA issue, Ramboll applied the BAAQMD’s cumulative health risk screening levels in evaluating the health risk impacts on the Project’s future residential receptors. The following cumulative health risk assessment (HRA) was conducted in accordance with the BAAQMD’s Guidelines, Appendix E, Recommended Methods for Screening and Modeling Local Risks and Hazards.<sup>2</sup> The BAAQMD recommends evaluating the potential sources of toxic air contaminant (TAC) emissions within 1,000 feet of sensitive receptors and provides tools with conservative estimates of impacts from these sources, including a stationary source tool and raster files for railways major streets, and highways. The cumulative assessment tabulates the health risk impacts from existing offsite sources (stationary and mobile) at the on-site sensitive receptor locations. The HRA considered any foreseeable future sources of TAC sources in the Project’s vicinity. In addition to the evaluation of each single source, the combined health risk from all sources emitting TAC and particulate matter less than 2.5 microns in size (PM<sub>2.5</sub>) are evaluated.

Based on the BAAQMD’s Permitting Stationary Sources Risks and Hazards Screening Tool,<sup>3</sup> there are no existing stationary sources of TAC emissions within 1,000 feet of the Project. Based on a review of the City’s Planning website<sup>4</sup> and the zoning maps of the Project’s vicinity<sup>5</sup>, no foreseeable future projects that could introduce new, permanent stationary TAC sources are identified within 1,000 feet of the Project.

<sup>2</sup> BAAQMD, 2023. 2022 CEQA Air Quality Guidelines, Appendix E, Recommended Methods for Screening and Modeling Local Risks and Hazards. Available at: [https://www.baaqmd.gov/~/media/files/planning-and-research/ceqa/ceqa-guidelines-2022/appendix-e-recommended-methods-for-screening-and-modeling-local-risks-and-hazards\\_final-pdf.pdf](https://www.baaqmd.gov/~/media/files/planning-and-research/ceqa/ceqa-guidelines-2022/appendix-e-recommended-methods-for-screening-and-modeling-local-risks-and-hazards_final-pdf.pdf). April.

<sup>3</sup> BAAQMD, 2023. Stationary Source Screening Map. Available at: <https://baaqmd.maps.arcgis.com/apps/webappviewer/index.html?id=845658c19eae4594b9f4b805fb9d89a3>. Updated on: April 10, 2023.

<sup>4</sup> City of Sunnyvale, 2024. CEQA Environmental Notices. Available at: <https://www.sunnyvale.ca.gov/business-and-development/planning-and-building/ceqa-environmental-notices>. Accessed on: January 17, 2023.

<sup>5</sup> City of Sunnyvale, 2024. Sunnyvale Zoning Map. Available at: <https://gis.sunnyvale.ca.gov/portal/apps/webappviewer/index.html?id=22396bd2d48140088e8931f4780da54c>. Accessed on: January 17, 2023.

The BAAQMD's raster files are intended to assist conducting cumulative cancer risk and hazard analyses from roadway sources (freeways and surface streets) and rail sources (rail lines and selected railyards).<sup>6</sup> The nearest rail line from the Project site is more than 1.5 miles away; any TAC emissions from rail sources at the Project site are negligible. Based on the BAAQMD's raster files for roadway TAC sources, the screening-level health risk impacts at the Project site are approximately 30-in-a-million for cancer risk, 0.2 for non-cancer chronic HI, and 0.59  $\mu\text{g}/\text{m}^3$  annual average  $\text{PM}_{2.5}$  concentrations. Therefore, the combined health risk impacts on the Project's receptors from all the cumulative sources are less than the screening levels recommended by the BAAQMD's Guidelines. The cumulative HRA demonstrates that the proposed residential receptors would not be exposed to substantial levels of TAC emissions.

The BAAQMD's Guidelines recommends that careful planning is appropriate when siting of new sensitive receptors, e.g., residential receptors, in areas with existing high local levels of air pollution.<sup>7</sup> According to the BAAQMD's Guidelines, the Planning Healthy Places guidebook presents best practices to reduce health risks from local air pollution and offers recommendations addressing and minimizing potential local air pollution issues early in the land-use planning and development process.<sup>8</sup>

The BAAQMD's Community Air Risk Evaluation Program (CARE) has worked on identifying communities with high health risk impacts since 2004.<sup>9</sup> However, Planning Healthy Places has developed a more detailed map which identifies higher impact areas on scales as small as 20x20 meter grids.<sup>10</sup> The map identifies areas that are likely to experience elevated levels of air pollution. Planning Healthy Places recommends that best practices should be applied or further study is necessary for these areas. Even though the Project's cumulative HRA, presented above, demonstrates that the health risk impacts on the proposed residential receptors are less than the BAAQMD's screening levels, the Project is located in an area designated as "best practices" by Planning Healthy Places. Therefore, the Project should implement strategies laid out in Planning Healthy Places to the extent such practices are applicable and feasible.

Strategies for reducing the Project's emissions are not relevant given the Project's size. However, the Project Sponsor can limit health risk impacts to on- and off-site residents by following best practices for reducing exposure.

To reduce the future residential receptors' exposure to existing TAC sources, the Project may implement the following best practices:

- Install air filters rated at a minimum efficiency reporting value (MERV) 13 or higher (This is now a mandatory measure required by the 2019 Building Energy Efficiency Standards<sup>11</sup>);
- Place sensitive land uses as far away from the highway as is feasible;

<sup>6</sup> BAAQMD, 2022. Mobile Source Screening Map. Available at: <https://www.baaqmd.gov/plans-and-climate/california-environmental-quality-act-ceqa/ceqa-tools/health-risk-screening-and-modeling>. December 8.

<sup>7</sup> BAAQMD, 2023. 2022 CEQA Air Quality Guidelines. Available at: <https://www.baaqmd.gov/plans-and-climate/california-environmental-quality-act-ceqa/updated-ceqa-guidelines>. April.

<sup>8</sup> BAAQMD, 2016. Planning Healthy Places. May.

<sup>9</sup> BAAQMD, 2014. Improving Air Quality & Health in Bay Area Communities: Community Air Risk Evaluation Program Retrospective & Path Forward (2004-2013). April.

<sup>10</sup> BAAQMD, 2024. Planning Healthy Places, Interactive Map. Available at: <https://baaqmd.maps.arcgis.com/apps/webappviewer/index.html?id=51c2d0bc59244013ad9d52b8c35cbf66>. Accessed on: January 17, 2024.

<sup>11</sup> California Energy Commission, 2019. 2019 Building Energy Efficiency Standards, What's New for Residential. Available at: [https://www.energy.ca.gov/sites/default/files/2020-03/Title\\_24\\_2019\\_Residential\\_WhatsNew\\_ada.pdf](https://www.energy.ca.gov/sites/default/files/2020-03/Title_24_2019_Residential_WhatsNew_ada.pdf). July.

- Consider including solid barriers, similar to sound walls, between buildings and the highway;
- Plant dense rows of vegetation, such as trees, between buildings and the highway; and
- Consider limiting use on the ground floor units of buildings near non-elevated section of highway.<sup>12</sup>

Items above limit exposure primarily to on-site residents. However, certain best practices, such as erecting solid and/or vegetation barriers, may benefit other nearby residents.

The Project site is already separated by dense rows of vegetation from US 101, which would reduce traffic pollution. The Project will also install air filters rated at MERV 13 or higher in compliance with Title 24. Incorporation of other practices above would further reduce the health risk impacts that are below the BAAQMD's screening levels. Planning Healthy Places includes several best practices that were excluded above, because they do not pertain to the Project. First, the suggestion to employ "health protective distances" where feasible is not practical for the Project site, given its small size and proximity to US 101. Similarly, the recommendations for project phasing were not relevant because the proposed residential buildings will not be completed in separate phases.

### **GREENHOUSE GAS IMPACTS**

GHGs are compounds in the atmosphere that are capable of absorbing infrared radiation, trapping heat in the Earth's atmosphere, and contributing to the greenhouse effect. Anthropogenic GHG emissions, primarily from the burning of fossil fuels, deforestation, and various industrial processes, enhance this natural greenhouse effect. The increased concentration of GHGs in the atmosphere leads to a rise in global temperatures, changes in weather patterns, and a host of other climate-related impacts.

Global climate change is inherently a cumulative problem. Because of the global scale of climate change, any one project's GHG contribution is unlikely to be significant by itself. Therefore, this memorandum provides an evaluation on whether the Project's incremental addition of GHG emissions to the Earth's atmosphere is cumulatively considerable in light of the global climate change.

The City's Climate Action Playbook, adopted in August 2019, serves as a framework for addressing climate change challenges and a roadmap for reducing GHG emissions by 80 percent by 2050. The Climate Action Playbook identifies key strategies and plays aiming to enable next-generation mobility solutions, enhance built environments, invest in clean technologies, and minimize human impacts on the natural environment. Six key strategies were established by the Climate Action Playbook: promoting clean electricity, decarbonizing buildings, decarbonizing transportation and promoting sustainable land uses, managing resources sustainably, empowering community, and adapting to a changing climate.<sup>13</sup>

The strategies and plays in the Climate Action Playbook are presented in **Table 1**. The applicability to the Project and the Project's consistency are also evaluated in **Table 1**. Because the Project is consistent with the Climate Action Playbook, it would support the City's and the State's goals of reducing GHG emissions by 40 percent by 2030 and by 80 percent by 2050. Therefore, the Project's GHG emissions are not cumulative considerable in the context of global climate change and effects on the surrounding neighborhood.

---

<sup>12</sup> BAAQMD, 2016. Planning Healthy Places. May.

<sup>13</sup> City of Sunnyvale, 2019. Climate Action Playbook. August.

**SUMMARY**

The Project at 640 Lakehaven Drive is in an area in which the BAAQMD recommends implementation of applicable and feasible best management practices to reduce health risk impacts from existing TAC emissions. Ramboll conducted a cumulative HRA, which demonstrates that the health risk impacts on the Project’s residents are below the BAAQMD’s screening levels. Exposure to residents is further reduced by including appropriate best practices recommended by the BAAQMD, such as installation of MERV 13 air filters in all residential units and including either solid or vegetative barriers between the residents the US 101. By following the best practices outlined above, the Project Sponsor can minimize health risk impacts on the Project’s future residents.

This memorandum also concludes that the Project is consistent with the City’s Climate Action Playbook. Therefore, the Project would contribute its fair share of GHG emissions reductions needed to meet the City’s and the State’s GHG reduction targets in 2030 and 2050. The Project’s GHG emissions are not cumulative considerable.

Sincerely,



**Michael Keinath, PE**  
Principal  
D. 1.415.796.1934  
[mkeinath@ramboll.com](mailto:mkeinath@ramboll.com)



**Ivy Tao, PhD**  
Senior Consultant  
D. 1.510.420.2501  
[ltao@ramboll.com](mailto:ltao@ramboll.com)

**Table 1**  
**Project's Consistency with City of Sunnyvale's Climate Action Playbook**  
**640 Lakehaven Drive**  
**Sunnyvale, California**

Strategy	Play	Applicability / Project's Consistency
1. Promoting Clean Electricity	1.1 Promote 100% clean electricity.	<b>Consistent.</b> The Project's electricity will be supplied by Silicon Valley Clean Energy, a community choice aggregation program providing default service plans with 45% eligible renewables, 24% nuclear power, and 31% hydroelectricity as of 2022.
	1.2 Increase local solar photovoltaics.	<b>Consistent.</b> The Project would install rooftop solar photovoltaics on the proposed buildings.
	1.3 Increase distributed electricity storage.	<b>Not applicable.</b> This is a measure directed at the City and Silicon Valley Clean Energy.
2. Decarbonizing Buildings	2.1 Reduce energy consumption in existing buildings.	<b>Not applicable.</b> The Project would not make changes to existing buildings.
	2.2 Support electrification of existing buildings.	
	2.3 Achieve all-electric new construction.	<b>Consistent.</b> In addition to compliance with the applicable Title 24 Building Energy Efficiency Standards, the proposed buildings would be all-electric, and would not include any natural gas appliances or plumbing. In addition, the Project would incorporate energy efficiency features such as cool roofs and heat pumps.
3. Decarbonizing Transportation & Sustainable Land Use	3.1 Increase opportunities for and encourage development of mixed-use sites to reduce vehicle miles per person.	<b>Consistent.</b> Although the Project would construct single-family homes in areas zoned for low density residential, the Project would increase the density of the site compared to the existing conditions.
	3.2 Increase transportation options and support shared mobility.	<b>Not applicable.</b> This measure is directed at the City. However, the Project is located near Class I and Class II bikeways, thus increasing opportunities for multimodal transportation for future residents of the site.
	3.3 Increase zero-emission vehicles.	<b>Consistent.</b> The Project would install electric vehicle chargers for all proposed parking spaces.
4. Managing Resources Sustainably	4.1 Achieve Zero Waste goals for solid waste	<b>Not applicable.</b> This measure is directed and the City. However, the Project would be serviced on garbage and recycling services provided by the City, subject to Senate Bill 1383.
	4.2 Ensure resilience of water supply	<b>Not applicable.</b> This measure is directed and the City.
	4.3 Enhance natural carbon sequestration capacity	<b>Consistent.</b> The Project would result in an increase in the number of trees on the site and plant drought-tolerant vegetation.
	4.4 Promote awareness of sustainable goods and services	<b>Not applicable.</b> This measure is directed and the City.
5. Empowering Our Community	5.1 Enhance community awareness and engagement	<b>Not applicable.</b> This measure is directed and the City.
	5.2 Track and share data and tools	
6. Adapting to a Changing Climate	6.1 Assess climate vulnerabilities for Sunnyvale	<b>Not applicable.</b> This measure is directed and the City.
	6.2 Protect shoreline area from sea level rise and coastal flooding	<b>Not applicable.</b> The Project is not located in the shoreline area nor the flood zone of the City.
	6.3 Strengthen community resiliency	<b>Not applicable.</b> This measure is directed and the City.

**Sources:**

City of Sunnyvale, 2019. Climate Action Playbook. August.  
Silicon Valley Clean Energy, 2024. 2022 Power Content Label. Accessed on: January 17, 2024.  
City of Sunnyvale, 2024. Flood Zone Viewer. Accessed on: January 17, 2024.