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M E M O

Date: October 30, 2025

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RE: Mills-Peninsula Medical Center, 1501 Trousdale Drive, Burlingame, CA

SUBJECT: Air Quality Analysis for Carport-Style Solar Module Construction and Helicopter Operations Job#25-109

Illingworth & Rodkin, Inc. (I&R) understands the City of Burlingame is processing a Conditional Use Permit (CUP) Amendment to the certified Environmental Impact Report (EIR) for the Mills-Peninsula Medical Center located at 1501 Trousdale Drive in Burlingame, California. This memo addresses air pollutant emissions and health risk impacts associated with construction of nine carport-style solar modules in the surface parking lots. In addition, the analysis addresses helicopter emissions based on the actual number of flight operations occurring at the helipad.

Setting

There are two categories of pollutants analyzed for California Environmental Quality Act (CEQA) compliance; criteria pollutants and toxic air contaminants (TACs). Criteria pollutants are those which have ambient air quality standards established by either the federal government (i.e., US EPA) or the State. TACs are pollutants that are known to either increase cancer risk or have non-cancer health impacts in high concentrations.

Criteria Pollutants – Ozone and Particulate Matter

High ozone concentrations in the air basin are caused by the cumulative emissions of reactive organic gases (ROG) and nitrogen oxides (NO_X). These precursor pollutants react under certain

meteorological conditions to form ozone. Controlling the emissions of these precursor pollutants is the focus of the Bay Area's attempts to reduce ambient ozone concentrations. The highest ozone concentrations in the Bay Area occur in the eastern and southern inland valleys downwind of existing air pollutant sources. High ozone concentrations aggravate respiratory and cardiovascular diseases, reduce lung function, and increase coughing and chest discomfort.

Particulate matter is another problematic air pollutant in the air basin. Particulate matter is assessed and measured in terms of respirable particulate matter or particles that have a diameter of 10 micrometers or less (PM_{10}) and fine particulate matter where particles have a diameter of 2.5 micrometers or less ($PM_{2.5}$). Elevated concentrations of PM_{10} and $PM_{2.5}$ are the result of both region-wide emissions and localized emissions. High particulate matter concentrations aggravate respiratory and cardiovascular diseases, reduce lung function, increase mortality (e.g., lung cancer), and result in reduced lung function growth in children. Due to the adverse health effects caused by $PM_{2.5}$ exposure even at low concentrations, the Air District has developed health risk thresholds to address exposure to increased $PM_{2.5}$ concentrations caused by projects.[1]

Toxic Air Contaminants

TACs are a broad class of compounds known to cause morbidity or mortality, often because they cause cancer. TACs are found in ambient air, especially in urban areas, and are caused by industry, agriculture, fuel combustion, and commercial operations (e.g., dry cleaners). TACs are typically found in low concentrations, even near their source (e.g., diesel particulate matter [DPM] near a freeway). Because chronic exposure of TACs can result in adverse health effects, they are regulated at the regional, State, and federal level.

Diesel exhaust is the predominant TAC in urban air and is estimated to represent about seventy percent of the cancer risk from TACs (based on the Bay Area average).[2] According to the California Air Resources Board (CARB), diesel exhaust is a complex mixture of gases, vapors, and fine particles. This complexity makes the evaluation of health effects from diesel exhaust exposure a complex scientific issue. Some of the chemicals in diesel exhaust, such as benzene and formaldehyde, have been previously identified as TACs by the CARB, and are listed as carcinogens either under the State's Proposition 65 or under the Federal Hazardous Air Pollutants programs. Health risks from TACs are estimated using the Office of Environmental Health Hazard Assessment (OEHHA) risk assessment guidelines, which were published in February of 2015 and incorporated into the Air District's CEQA guidance.[3]

The Air District also considers $PM_{2.5}$ to be a TAC due to the adverse health effects caused by $PM_{2.5}$ exposure even at low concentrations. As a result, they have developed CEQA health risk thresholds to address exposure to increased concentrations of $PM_{2.5}$.[4]

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1 Bay Area Air District, 2022 CEQA Air Quality Guidelines, Appendix A, p40.
2 CARB, *Summary: Diesel Particulate Matter Health Impacts*, Web: https://ww2.arb.ca.gov/resources/summary-diesel-particulate-matter-health-impacts#footnote1_7yob8j5.
3 OEHHA, 2015. *Air Toxics Hot Spots Program Risk Assessment Guidelines, The Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments*. Office of Environmental Health Hazard Assessment. February.
4 Bay Area Air District, 2022 CEQA Air Quality Guidelines, Appendix A, p40.

Sensitive Receptors

There are groups of people more affected by air pollution than others. CARB has identified the following persons who are most likely to be affected by air pollution: children under 16, people over 65, athletes, and people with cardiovascular and chronic respiratory diseases. These groups are classified as sensitive receptors. Locations that may contain a high concentration of these sensitive population groups include residential areas, hospitals, daycare facilities, elder care facilities, and elementary schools. For cancer risk assessments, infants and small children are the most sensitive receptors, since they are more susceptible to cancer causing TACs. Residential locations are assumed to include infants and small children. The closest sensitive receptors are the nearby medical facilities that treat patients and single-family residences to the east-southeast of the project site.

Bay Area Air District CEQA Air Quality Guidelines

In June 2010, the Air District adopted thresholds of significance to assist in the review of projects under CEQA. In 2023, the Air District revised the *CEQA Air Quality Guidelines* that include significance thresholds to assist in the evaluation of air quality impacts of projects and plans proposed within the Bay Area. The current the Air District guidelines provide recommended procedures for evaluating potential air impacts during the environmental review process consistent with CEQA requirements including thresholds of significance, mitigation measures, and background air quality information. They include assessment methodologies for criteria air pollutants, air toxics, odors, and greenhouse gas (GHG) emissions, as shown in Table 1.[5] Air quality impacts and health risks are considered potentially significant for CEQA purposes if they exceed these thresholds.

The Air District recommends all projects include a "basic" set of best management practices (BMPs) to manage fugitive dust and consider impacts from dust (i.e., fugitive PM_{10} and $PM_{2.5}$) to be less than significant if BMPs are implemented (listed below). The Air District strongly encourages enhanced BMPs for construction sites near schools, residential areas, other sensitive land uses, or if air quality impacts were found to be significant.

Construction Emissions

The most current version of the California Emissions Estimator Model (CalEEMod) Version 2022 was used to compute emission associated with construction of solar photovoltaic modules throughout the parking lot. Construction would involve removal of some trees, concrete demolition, drilling of support columns, installation and assembly of structures/modules, and construction traffic. A projection of the construction schedule and activity, including truck deliveries, was provided for this project. These data were input to the CalEEMod model. *Attachment 1* includes the construction information used in the modeling along with the CalEEMod model outputs.

5 Bay Area Air District, 2023. *2022 CEQA Guidelines*. April.

Table 1. Bay Area Air District CEQA Significance Thresholds

Criteria Air Pollutant	Construction Thresholds			
	Average Daily Emissions (lbs./day)			
ROG	54			
NO_x	54			
PM_{10}	82 (Exhaust)			
$PM_{2.5}$	54 (Exhaust)			
CO	Not Applicable			
Fugitive Dust (PM_{10}/$PM_{2.5}$)	Best Management Practices (BMPs)*			
Health Risks and Hazards	**Single Sources / Individual Projects**		**Combined Sources (Cumulative from all sources within 1000-foot zone of influence)**	
Excess Cancer Risk	>10 in a million	OR Compliance with Qualified Community Risk Reduction Plan	>100 in a million	OR Compliance with Qualified Community Risk Reduction Plan
Hazard Index	>1.0		>10.0	
Incremental annual $PM_{2.5}$	>0.3 µg/m^3		>0.8 µg/m^3	

Note: ROG = reactive organic gases, NOx = nitrogen oxides, PM_{10} = course particulate matter or particulates with an aerodynamic diameter of 10 micrometers (µm) or less, $PM_{2.5}$ = fine particulate matter or particulates with an aerodynamic diameter of 2.5µm or less.

* The Bay Area Air District strongly recommends implementing all feasible fugitive dust management practices especially when construction projects are located near sensitive communities, including schools, residential areas, or other sensitive land uses.

Source: Bay Area Air District, 2022 CEQA Air Quality Guidelines

Construction would occur over 102 days in 2026. Phases included in the modeling were Demolition, Columns\Foundation work, and Structures Construction. CalEEMod computed the total emissions, which were divided by 102 workdays to predict the average daily emissions. Results of this assessment are provided in Table 2. Average daily emissions are predicted to be well below the Air District significance thresholds.

Table 2. Construction Period Emissions - Uncontrolled

Year	ROG	NOx	PM_{10} Exhaust	$PM_{2.5}$ Exhaust
Construction Emissions Total (Tons)				
2026	0.01	0.07	0.002	0.002
Average Daily Construction Emissions (pounds/day)				
2026 (102 construction workdays)	0.14	1.30	0.03	0.03
Bay Area Air District Thresholds (pounds per day)	*54* lbs./day	*54* lbs./day	*82* lbs./day	*54* lbs./day
Exceed Threshold?	No	No	No	No

Helicopter Emissions

The City requested the CUP Amendment to cover existing helipad usage at the facility to reflect the actual number of trips that are occurring. The approved EIR for the medical center had evaluated six flights per year, the City's Conditions of Approval allowed up to 24, and in reality,

the facility has received more helicopter flights. There was a peak of 117 flights in 2023.[6] The emissions associated with the maximum helicopter flights were predicted and compared against Air District thresholds.

Helicopter operations result in emissions during two types of operations: landing-take-off (LTO) operation cycles and cruise. For this assessment, a single engine Hughes MD500E was assumed. These emissions were computed separately from CalEEMod based on published emission factors for various helicopter models.[7] The emissions account for 117 LTO cycles per day in addition to ¼ -hour of flight. Each helicopter landing was associated with two LTO cycles and one-half hour of flight cruise emissions. Emission factors were based on two helicopter types that were identified in the *Mills-Peninsula Medical Center Updated Helicopter Noise Analysis*, dated April 21, 2025. That study identified a BO-105 helicopter as accounting for 90 percent of the flights and a Bell 429 helicopter accounting for 10 percent of the flights. Note a Bell 222 helicopter was used in the emissions analysis instead of a model 429 since emissions data are not available. The 222 model is a similar sized aircraft. Emissions from this activity are reported in Table 3. Annual and average daily emissions are well below the Air District significance thresholds. There are no quantified emissions thresholds for CO and CO_2.

Table 3. Helicopter Air Pollutant and GHG Emissions

Type	Quantity[a]	NOx	HC	CO[b]	PM10/PM2.5	CO_2[b]
		Annual Emissions (tons/metric tons)				
BO 105	105.3	0.09	0.33	0.42	0.00	54
Bell 222 (Bell 429)	11.7	0.02	0.03	0.03	0.00	8
Total		0.11	0.36	0.46	<0.01	61.90
Air District Thresholds		10	10	--	15/10	--
		Average Daily Emissions (lbs/day)				
Total		0.6	1.9	2.5	<0.01	--
Air District Thresholds		54	54	--	82/54	--

[a] Number of annual flights = 117
[b] No quantified thresholds

Health Risk Impacts

Typically, health risk assessments are prepared for activities that result in substantial emissions of TACs. Large sources of TACs include large industrial or manufacturing facilities (including refineries), marine ports that have shipping, railyard and rail lines, highways and freeways, and construction activities. Construction activities include use of diesel off-road equipment and heavy-duty diesel trucks. Heliports are not a listed source of TACs by the California Air Resources Board or the Bay Area Air District. Furthermore, they involve infrequent aircraft operations. These aircraft use aviation fuel, which does not emit the higher rate of TACs that diesel fuel emits.

[6] Shen Milsom Wilke 2025 *Mills-Peninsula Medical Center Updated Helicopter Noise Analysis*, dated April 21, 202
[7] Swiss Confederation 2015 *Guidance on the Determination of Helicopter Emissions*, Edition 2. Available at: https://www.bazl.admin.ch/bazl/en/home/specialists/regulations-and-guidelines/environment/pollutant-emissions/aircraft-engine-emissions/guidance-on-the-determination-of-helicopter-emissions.html Accessed June 16, 2022.

The proposed Solar Project results in temporary emissions from construction activities. As reported in Table 2, these emissions are quite small and well below the Air District thresholds. They are expected to last less than six months and be distributed throughout the parking lots, such that intense emissions are not occurring in any one location. Construction activities would occur about 100 to over 500 feet from nearby sensitive receptors. Extensive use of diesel-powered equipment would not occur. There would be some minor demolition; however, earthwork is not proposed. As a result, these temporary emissions would not pose any significant health risk impacts.

The heliport would not pose a health risk impact because the emissions from infrequent helicopters operations would not have substantial TAC emissions. The heliport is used less than once per day, on average, during the busiest year of flight log information.

Supporting Documentation

Attachment 1 includes the CalEEMod outputs for project construction emissions. Also included are any modeling assumptions.

Attachment 2 includes the helicopter emissions calculations.

Attachment 1: CalEEMod Input Assumptions and Outputs

Attachment 2: Helicopter Emissions Calculations