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October 17, 2023

By E-mail

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Re: Appeal of the City of Sunnyvale Planning Commission's Decision to Approve the Special Development Permit, Tentative Parcel Map, and CEQA Determinations Pursuant to 15162 and 15168(c)(2) and (4) for the 1150-1170 Kifer Road Project (File #: 2022-7168)

Dear Mr. Carnahan, Mr. Schroeder, and Ms. Bagley:

I am writing on behalf of the Laborers International Union of North America, Local Union No. 270 ("LIUNA") and its members living and/or working in or around the City of Sunnyvale ("City"). LIUNA hereby appeals the Planning Commission's decision to approve the Special Development Permit, Tentative Parcel Map, and CEQA determinations pursuant to 15162 and 15168(c)(2) and (4) on October 9, 2023, for the project known as 1150-1170 Kifer Road located at 1150-1170 Kifer Road (File #: 2022-7168) (APNs: 205-50-034 and 205-50-035) in the City of Sunnyvale, California by applicant Prometheus Real Estate Group ("Project"). These appeals are filed pursuant to City of Sunnyvale Municipal Code section 19.98.070, establishing procedures for the appeal of a final decision of the Planning Commission to the City Council by filing a written appeal with the City Clerk.

In the prior 2016 Lawrence Station Area Plan Environmental Impact Report, State Clearinghouse No. 2013082030 ("2016 EIR") and 2021 Lawrence Station Area Plan Update/Intuitive Surgical Corporate Campus Project Subsequent Environmental Impact Report, State Clearinghouse No. 2019012022 ("2021 SEIR"), the City did not evaluate the Project's indoor air emissions of formaldehyde. Since 2016, new information regarding the inability of existing regulations adopted by the California Air Resources Board to reduce indoor air emissions of formaldehyde to levels approaching 10 in a million cancer risks has become available since 2016. (See Comments of Francis J. Offermann PE, CIH re: Indoor Air Quality: 1150-1170 Kifer Apartments Project, San Jose, CA (Oct. 9, 2023). As LIUNA's expert consultant determined, the Project's emission of formaldehyde to indoor air in the proposed buildings will result in cancer risks to residents of 120 cancers per million, well above the applicable threshold of 10 in a million. Because this information regarding the inability of the 2009 California Air Resources Control

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Board's Airborne Toxics Control Measure for formaldehyde in composite wood products to eliminate the health risks posed by formaldehyde emissions to indoor air of residential projects was not available at the time of the 2016 EIR, that impact must be considered in the review of the Project. Likewise, because at the program EIR stage, the City could not have known of the type of interior finishing products any given project was proposing to use, the presence of high levels of formaldehyde from composite wood materials also is new information that must be addressed for the Project.

The 2021 SEIR did not involve any new residential projects within the plan area adopted in 2016, instead addressing expanding the Lawrence Station Area Plan boundary to encompass the Intuitive Surgical Corporate Campus Project and rezoning within that expanded area. The current Project falls within the 2016 plan area. No issue of residential formaldehyde emissions within that area was within the scope of the 2021 SEIR.

As a result, pursuant to CEQA Guidelines § 15162, a subsequent EIR must be prepared for the Project in order to address the “[n]ew information of substantial importance” presented by Mr. Offermann, “which was not known and could not have been known with the exercise of reasonable diligence at the time the previous EIR was certified as complete” and which shows that “[t]he project will have one or more significant effects not discussed in the previous EIR...” 14 Cal. Admin. Code § 15162(a)(3)(A). *See also* 14 Cal. Admin. Code § 15168 (only “[i]f the agency finds that pursuant to Section 15162, no subsequent EIR would be required, the agency can approve the activity as being within the scope of the project covered by the program EIR, and no new environmental document would be required”].)

In addition, because the prior 2016 EIR, and to the extent relevant the 2021 SEIR, found that the overall Area Plan project would have a significant and unavoidable cumulative impact to air quality from construction activities, the City must consider and adopt a statement of overriding considerations for that impact for this Project prior to its approval. The Environmental Checklist's conclusion that simply because the Project itself would not cause a significant impact, is not sufficient evidence to demonstrate that the Project would not contribute to the cumulative construction emission impact recognized in the prior EIRs.

This appeal incorporates the prior comments submitted on behalf of LIUNA as well as the indoor air analysis conducted for the Project by Francis J. Offermann, PE CIH, which are attached hereto as Attachment 1.

LIUNA requests that the City Council vacate the MND, the Special Development Permit, and the Tentative Parcel Map, and instruct staff to prepare a subsequent EIR for the Project prior to reconsidering the proposed permit and map.

Sincerely,

A handwritten signature in dark ink, appearing to read "Victoria Yundt", is written over a light gray circular stamp.

Victoria Yundt
Lozeau Drury LLP

ATTACHMENT 1



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October 9, 2023

VIA EMAIL

Martin Pyne, Chair
Nathan Iglesias, Vice Chair
Galen Davis, Commissioner
Daniel Howard, Commissioner
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Re: 1150-1170 Kifer Road Project, Planning Commission Agenda Item 3 (October 9, 2023)

Dear Chair Pyne, Vice Chair Iglesias, Honorable Members of the Planning Commission, and Mr. Schroeder:

I am writing on behalf of the Laborers International Union of North America, Local Union 270 and its members living in the City of Sunnyvale ("LIUNA"), concerning the residential project known as 1150-1170 Kifer Road ("Project") to be heard as Agenda Item 3 at the October 9, 2023 Planning Commission Meeting. City staff has determined that the Project is exempt from the requirement for preparation of environmental documents pursuant to Sections 15162 and 15168(c)(2) and (4) of the California Environmental Quality Act ("CEQA"), and that the Project was adequately analyzed in the 2016 Lawrence Station Area Plan Environmental Impact Report, State Clearinghouse No. 2013082030 ("2016 EIR") and 2021 Lawrence Station Area Plan Update/Intuitive Surgical Corporate Campus Project Subsequent Environmental Impact Report, State Clearinghouse No. 2019012022 ("2021 SEIR").

When relying on a prior EIR for a project, CEQA provides certain procedures, including required findings, prior to a determination that no new environmental documentation is required. Although no new documentation is required in certain circumstances, CEQA also mandates the circumstances in which reliance on a previous EIR still requires the preparation of an additional environmental impact report ("EIR") or mitigated negative declaration ("MND").

After reviewing the Final Environmental Review Checklist prepared for the Project and the 2016 EIR and 2021 SEIR that Project relies upon, we conclude that the Project does not qualify for review pursuant to a prior EIR under CEQA Guidelines sections 15162 and

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15168(c)(2) and (4). As evidenced by the expert comments submitted by Certified Industrial Hygienist, Francis Offermann, PE, CIH, the Project has significant indoor air quality and health risk impacts not analyzed in the 2016 EIR or 2021 SEIR. Mr. Offermann's comment and curriculum vitae are attached as Exhibit A hereto and is incorporated herein by reference in its entirety. The 2016 EIR or 2021 SEIR identified several adverse environmental impacts that would result from the Project that are significant and unavoidable, including air quality impacts and cumulative air quality impacts. However, the Project fails to implement air quality mitigation measures required by the 2016 EIR and 2021 SEIR. As such, LIUNA is requesting that the Planning Commission refrain from approval of the Project at this time until an EIR is prepared.

PROJECT DESCRIPTION AND BACKGROUND

The proposed Project includes the demolition an existing surface parking lot at the rear of two existing office buildings and construction of 225 apartment units at a density of 112.5 dwelling units per acre in an eight-story building inclusive of three levels of above-ground parking located at 1150-1170 Kifer Road (APNs: 205-50-034 and 205-50-035) in the City of Sunnyvale ("City"). The project site consists of 5.82 acres and is zoned as MXD-I (Flexible Mixed-Use I). Prometheus Real Estate Group (applicant) and 1150 Kifer LP (owner) are requesting a Special Development Permit and Tentative Parcel Map.

The City has not prepared any subsequent environmental review document for this specific Project pursuant to CEQA. Rather, the City is claiming that the Project was adequately reviewed in the following documents:

- 2016 Lawrence Station Area Plan Environmental Impact Report, State Clearinghouse No. 2013082030 ("2016 EIR");
- 2021 Lawrence Station Area Plan Update/Intuitive Surgical Corporate Campus Project Subsequent Environmental Impact Report, State Clearinghouse No. 2019012022("2021 SEIR");
- September 2023 Final Environmental Review Checklist for the 1150-1170 Kifer Road Project ("CEQA Checklist")

The September 2023 CEQA Checklist was not made available to the public until October 5, 2023. Given the limited time to review this information, LIUNA requests that the Planning Commission continue the public hearing to a later date, to give the Appellant and the public sufficient time to review the documents.

LEGAL STANDARD

CEQA contains a strong presumption in favor of requiring a lead agency to prepare an EIR. This presumption is reflected in the fair argument standard. Under that standard, a lead agency must prepare an EIR whenever there is substantial evidence in the whole record before the agency that supports a fair argument that a project may have a significant effect on the

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environment. (Pub. Res. Code § 21082.2; *Laurel Heights Improvement Ass'n v. Regents of the University of California* (1993) 6 Cal.4th 1112, 1123; *No Oil, Inc. v. City of Los Angeles* (1974) 13 Cal.3d 68, 75, 82; *Quail Botanical Gardens v. City of Encinitas* (1994) 29 Cal.App.4th 1597, 1602.)

CEQA permits agencies to ‘tier’ CEQA documents, in which general matters and environmental effects are considered in a document “prepared for a policy, plan, program or ordinance followed by narrower or site-specific [environmental review] which incorporate by reference the discussion in any prior [environmental review] and which concentrate on the environmental effects which (a) are capable of being mitigated, or (b) were not analyzed as significant effects on the environment in the prior [EIR].” (Pub. Res. Code (“PRC”) § 21068.5.) “[T]iering is appropriate when it helps a public agency to focus upon the issues ripe for decision at each level of environmental review and in order to exclude duplicative analysis of environmental effects examined in previous [environmental reviews].” (*Id.* § 21093.) CEQA regulations strongly promote tiering of environmental review.

Where a program EIR has been prepared, such as the 2021 EIR, “[l]ater activities in the program must be examined in light of the program [document] to determine whether an additional environmental document must be prepared.” (14 CCR § 15168(c).) The first consideration is whether the activity proposed is covered by the program. (14 CCR § 15168(c)(2).) If a later project is outside the scope of the program, then it is treated as a separate project and the previous environmental review may not be relied upon in further review. (*See Sierra Club v. County of Sonoma* (1992) 6 Cal.App.4th 1307, 1320–21.) The second consideration is whether the “later activity would have effects that were not examined in the program.” (14 CCR § 15168(c)(1).) A program environmental review may only serve “to the extent that it contemplates and adequately analyzes the potential environmental impacts of the project” (*Sierra Nevada Conservation v. County of El Dorado* (2012) 202 Cal.App.4th 1156, 1171 [quoting *Citizens for Responsible Equitable Env'tl. Dev. v. City of San Diego Redevelopment Agency* (2005) 134 Cal.App.4th 598, 615].) If the program environmental review does not evaluate the environmental impacts of the project, a tiered [CEQA document] must be completed before the project is approved. (*Id.* at 1184.)

Pursuant to Guidelines sections 15162(a) and 15168(c), a project is not within the scope of a previous program EIR, and subsequent environmental review is necessary, where:

- (1) Substantial changes are proposed in the project which will require major revisions of the previous EIR or negative declaration due to the involvement of new significant environmental effects or a substantial increase in the severity of previously identified significant effects;
- (2) Substantial changes occur with respect to the circumstances under which the project is undertaken which will require major revisions of the previous EIR or Negative Declaration due to the involvement of new significant environmental effects or a substantial increase in the severity of previously identified significant effects; or

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- (3) New information of substantial importance, which was not known and could not have been known with the exercise of reasonable diligence at the time the previous EIR was certified as complete or the negative declaration was adopted, shows any of the following:
 - (A) The project will have one or more significant effects not discussed in the previous EIR or negative declaration;
 - (B) Significant effects previously examined will be substantially more severe than shown in the previous EIR;
 - (C) Mitigation measures or alternatives previously found not to be feasible would, in fact, be feasible and would substantially reduce one or more significant effects of the project, but the project proponents decline to adopt the mitigation measure or alternative; or
 - (D) Mitigation measures or alternatives which are considerably different from those analyzed in the previous EIR would substantially reduce one or more significant effects on the environment, but the project proponents decline to adopt the mitigation measure or alternative.

An agency's determination that none of the conditions of Section 15162 have been met and, therefore, that no subsequent EIR or MND is required for the new project must be supported by substantial evidence. (14 CCR § 15162(a); 14 CCR § 15168(c).)

DISCUSSION

I. The Project May Have Significant Indoor Air Quality and Human Health Impact That Were Not Analyzed as a Significant Impact in the 2016 EIR and 2021 SEIR.

The City is relying on the 2016 EIR and 2021 SEIR for CEQA review of the Project pursuant to CEQA's subsequent review provisions, 14 CCR § 15162. However, under 14 CCR § 15162(a)(3)(A), an agency cannot avoid preparation of a subsequent or supplemental EIR or MND for a project if new information of substantial importance shows that the project will have one or more significant effects not discussed in the previous EIR or negative declaration. Here, there is new information and mitigation measures regarding the Project's significant effects that were not discussed in the 2016 EIR and 2021 SEIR, therefore the City must prepare a subsequent or supplemental EIR or MND.

Certified Industrial Hygienist, Francis Offermann, PE, CIH, has conducted a review of the proposed Project and relevant documents regarding the Project's indoor air emissions. Indoor Environmental Engineering Comments (October 9, 2023) (Exhibit A). Mr. Offermann concludes that it is likely that the Project will expose residents of the Project to significant impacts related to indoor air quality, and in particular, emissions of the cancer-causing chemical formaldehyde. Mr. Offermann is a leading expert on indoor air quality and has published extensively on the topic. Mr. Offermann's expert comments and curriculum vitae are attached as Exhibit A.

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Mr. Offermann explains that many composite wood products used in building materials and furnishings commonly found in offices, warehouses, residences, and hotels contain formaldehyde-based glues which off-gas formaldehyde over a very long time period. He states, “The primary source of formaldehyde indoors is composite wood products manufactured with urea-formaldehyde resins, such as plywood, medium density fiberboard, and particleboard. These materials are commonly used in building construction for flooring, cabinetry, baseboards, window shades, interior doors, and window and door trims.” (Ex. A, pp. 2-3.)

Formaldehyde is a known human carcinogen. Mr. Offermann states that there is a fair argument that future residents of the Project will be exposed to a cancer risk from formaldehyde of approximately 120 per million, *even assuming* all materials are compliant with the California Air Resources Board’s formaldehyde airborne toxics control measure. (*Id.*, pp. 3-5.) This exceeds the Bay Area Air Quality Management District (“BAAQMD”) CEQA significance threshold for airborne cancer risk of 10 per million. (*Id.*, pp. 2-4.)

Mr. Offermann also notes that the high cancer risk that may be posed by the Project’s indoor air emissions likely will be exacerbated by the additional cancer risk that exists as a result of the Project’s location near roadways with moderate to high traffic (i.e., Kifer Road, Lawrence Expressway, Althea Terrace, etc.). (*Id.*, pp. 10-11.) Yet no analysis has been conducted of the significant cumulative health impacts that will result to residents living or working at the Project. Mr. Offermann provides several feasible mitigation measures to lessen the Project’s significant impacts to air quality and human health due to indoor emissions formaldehyde; none of which have been included in the 2021 FEIR or implemented by the City for purposes of this Project. (See Ex. A, pp. 11-13.)

The 2021 FEIR fails to disclose, analyze, or mitigate these new significant impacts. Because Mr. Offermann’s expert review is substantial evidence of a fair argument of a significant environmental impact to future users of the project, a subsequent or supplemental EIR or MND should be prepared to disclose and mitigate those impacts. As such, the City cannot rely on CEQA Guidelines sections 15162 and 15168(c)(2) and (4) and must prepare either a subsequent or supplemental EIR or MND.

II. Because the 2016 EIR and 2021 SEIR Concluded that the Project Would Result in Significant and Unavoidable Impacts, a Tiered MND or EIR Is Required for the Project.

A tiered EIR or MND is required for the Project due to impacts that remain significant and unavoidable. When a prior EIR, such as the 2016 EIR and 2021 SEIR, admits significant and unavoidable impacts, a later project requires its own EIR or MND and statement of overriding considerations for any impacts that remain significant and unavoidable. (*Communities for a Better Env’t. v. Cal. Res. Agency* (2002) 103 Cal.App.4th 98, 124-25.)

The 2021 FEIR found significant and unavoidable impacts to air quality and significant and unavoidable cumulative impacts on air quality and wastewater services. (Draft 2021 SEIR,

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pp. E-3, 3.2-1, 3.2-12–15, 4-5–6 (air quality impacts and cumulative air quality impacts), *id.* p. 4-22 (cumulative wastewater service impacts).) As such, these impacts will remain significant and unavoidable.

Even though these impacts were found significant and unavoidable in the 2016 EIR and 2021 SEIR and the City adopted a statement of overriding considerations at that time, the City cannot “adopt one statement of overriding considerations for a prior, more general EIR, and then avoid future political accountability by approving later, more specific projects with significant unavoidable impacts pursuant to the prior EIR and statement of overriding considerations.” (*Communities for a Better Env't.*, *supra*, 103 Cal.App.4th at 124.)

Therefore, the Project requires its own subsequent EIR and statement of overriding considerations to ensure that the City “go[es] on the record and explain specifically why they are approving the later project despite *its* significant unavoidable impacts.” (*Communities for a Better Env't.*, *supra*, 103 Cal.App.4th at 125.)

III. The City May Not Rely on the 2016 EIR and 2021 SEIR Because It Failed to Implement Feasible Air Quality Mitigation Measures Required by the 2016 EIR and 2021 SEIR.

The 2016 EIR and 2021 SEIR conclude that the Project will have significant and unavoidable air quality and cumulative air quality impacts. However, the City has failed to implement all of the applicable and feasible mitigation measures as is required by the 2016 SEIR and 2021 SEIR. (*See* Draft 2021 SEIR, pp. E-3, 3.2-1, 3.2-12–15, 4-5–6.) Specifically, the 2016 EIR and 2021 SEIR requires that future Projects implement 2016 LSAP Mitigation Measures 3.5.3a and 3.5.3b and 2021 LSAP Update Mitigation Measure 3.2-1. But according to the September 2023 CEQA checklist, only Mitigation Measure 3.5.3a will be implemented for the Project. (*See* CEQA Checklist, pp. 4-13 and 4-16.) As such, the City cannot rely on CEQA Guidelines sections 15162 and 15168(c)(2) and (4), and must prepare a subsequent or supplemental EIR or MND.

CONCLUSION

For the above reasons, LIUNA respectfully requests that the Planning Commission refrain from approving the Project at this time. Rather, the City should prepare a new EIR for the Project that tiers from the 2016 EIR and 2021 SEIR prior to approval.

Sincerely,



Victoria Yundt
LOZEAU | DRURY LLP

EXHIBIT A



INDOOR ENVIRONMENTAL ENGINEERING



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Date: October 9, 2023

To: Victoria Yundt
Lozeau | Drury LLP
1939 Harrison Street, Suite 150
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From: Francis J. Offermann PE CIH

Subject: Indoor Air Quality: 1150-1170 Kifer Apartments Project, San Jose, CA
(IEE File Reference: P-4756)

Pages: 18

Indoor Air Quality Impacts

Indoor air quality (IAQ) directly impacts the comfort and health of building occupants, and the achievement of acceptable IAQ in newly constructed and renovated buildings is a well-recognized design objective. For example, IAQ is addressed by major high-performance building rating systems and building codes (California Building Standards Commission, 2014; USGBC, 2014). Indoor air quality in homes is particularly important because occupants, on average, spend approximately ninety percent of their time indoors with the majority of this time spent at home (EPA, 2011). Some segments of the population that are most susceptible to the effects of poor IAQ, such as the very young and the elderly, occupy their homes almost continuously. Additionally, an increasing number of adults are working from home at least some of the time during the workweek. Indoor air quality also is a serious concern for workers in hotels, offices and other business establishments.

The concentrations of many air pollutants often are elevated in homes and other buildings relative to outdoor air because many of the materials and products used indoors contain

and release a variety of pollutants to air (Hodgson et al., 2002; Offermann and Hodgson, 2011). With respect to indoor air contaminants for which inhalation is the primary route of exposure, the critical design and construction parameters are the provision of adequate ventilation and the reduction of indoor sources of the contaminants.

Indoor Formaldehyde Concentrations Impact. In the California New Home Study (CNHS) of 108 new homes in California (Offermann, 2009), 25 air contaminants were measured, and formaldehyde was identified as the indoor air contaminant with the highest cancer risk as determined by the California Proposition 65 Safe Harbor Levels (OEHHA, 2017a), No Significant Risk Levels (NSRL) for carcinogens. The NSRL is the daily intake level calculated to result in one excess case of cancer in an exposed population of 100,000 (i.e., ten in one million cancer risk) and for formaldehyde is 40 $\mu\text{g}/\text{day}$. The NSRL concentration of formaldehyde that represents a daily dose of 40 μg is 2 $\mu\text{g}/\text{m}^3$, assuming a continuous 24-hour exposure, a total daily inhaled air volume of 20 m^3 , and 100% absorption by the respiratory system. All of the CNHS homes exceeded this NSRL concentration of 2 $\mu\text{g}/\text{m}^3$. The median indoor formaldehyde concentration was 36 $\mu\text{g}/\text{m}^3$, and ranged from 4.8 to 136 $\mu\text{g}/\text{m}^3$, which corresponds to a median exceedance of the 2 $\mu\text{g}/\text{m}^3$ NSRL concentration of 18 and a range of 2.3 to 68.

Therefore, the cancer risk of a resident living in a California home with the median indoor formaldehyde concentration of 36 $\mu\text{g}/\text{m}^3$, is 180 per million as a result of formaldehyde alone. The CEQA significance threshold for airborne cancer risk is 10 per million, as established by the Bay Area Air Quality Management District (BAAQMD, 2017).

Besides being a human carcinogen, formaldehyde is also a potent eye and respiratory irritant. In the CNHS, many homes exceeded the non-cancer reference exposure levels (RELs) prescribed by California Office of Environmental Health Hazard Assessment (OEHHA, 2017b). The percentage of homes exceeding the RELs ranged from 98% for the Chronic REL of 9 $\mu\text{g}/\text{m}^3$ to 28% for the Acute REL of 55 $\mu\text{g}/\text{m}^3$.

The primary source of formaldehyde indoors is composite wood products manufactured with urea-formaldehyde resins, such as plywood, medium density fiberboard, and

particleboard. These materials are commonly used in building construction for flooring, cabinetry, baseboards, window shades, interior doors, and window and door trims.

In January 2009, the California Air Resources Board (CARB) adopted an airborne toxics control measure (ATCM) to reduce formaldehyde emissions from composite wood products, including hardwood plywood, particleboard, medium density fiberboard, and also furniture and other finished products made with these wood products (California Air Resources Board 2009). While this formaldehyde ATCM has resulted in reduced emissions from composite wood products sold in California, they do not preclude that homes built with composite wood products meeting the CARB ATCM will have indoor formaldehyde concentrations below cancer and non-cancer exposure guidelines.

A follow up study to the California New Home Study (CNHS) was conducted in 2016-2018 (Singer et. al., 2019), and found that the median indoor formaldehyde in new homes built after 2009 with CARB Phase 2 Formaldehyde ATCM materials had lower indoor formaldehyde concentrations, with a median indoor concentrations of $22.4 \mu\text{g}/\text{m}^3$ (18.2 ppb) as compared to a median of $36 \mu\text{g}/\text{m}^3$ found in the 2007 CNHS. Unlike in the CNHS study where formaldehyde concentrations were measured with pumped DNPH samplers, the formaldehyde concentrations in the HENGH study were measured with passive samplers, which were estimated to under-measure the true indoor formaldehyde concentrations by approximately 7.5%. Applying this correction to the HENGH indoor formaldehyde concentrations results in a median indoor concentration of $24.1 \mu\text{g}/\text{m}^3$, which is 33% lower than the $36 \mu\text{g}/\text{m}^3$ found in the 2007 CNHS.

Thus, while new homes built after the 2009 CARB formaldehyde ATCM have a 33% lower median indoor formaldehyde concentration and cancer risk, the median lifetime cancer risk is still 120 per million for homes built with CARB compliant composite wood products. This median lifetime cancer risk is more than 12 times the OEHHHA 10 in a million cancer risk threshold (OEHHHA, 2017a).

With respect to 1150-1170 Kifer Apartments Project, San Jose, CA, the buildings consist of residential spaces.

The residential occupants will potentially have continuous exposure (e.g., 24 hours per day, 52 weeks per year). These exposures are anticipated to result in significant cancer risks resulting from exposures to formaldehyde released by the building materials and furnishing commonly found in residential construction.

Because these residences will be constructed with CARB Phase 2 Formaldehyde ATCM materials and be ventilated with the minimum code required amount of outdoor air, the indoor residential formaldehyde concentrations are likely similar to those concentrations observed in residences built with CARB Phase 2 Formaldehyde ATCM materials, which is a median of $24.1 \mu\text{g}/\text{m}^3$ (Singer et. al., 2020).

Assuming that the residential occupants inhale 20 m^3 of air per day, the average 70-year lifetime formaldehyde daily dose is $482 \mu\text{g}/\text{day}$ for continuous exposure in the residences. This exposure represents a cancer risk of 120 per million, which is more than 12 times the CEQA cancer risk of 10 per million. For occupants that do not have continuous exposure, the cancer risk will be proportionally less but still substantially over the CEQA cancer risk of 10 per million (e.g., for 12/hour/day occupancy, more than 6 times the CEQA cancer risk of 10 per million).

In addition, we note that the average outdoor air concentration of formaldehyde in California is 3 ppb, or $3.7 \mu\text{g}/\text{m}^3$, (California Air Resources Board, 2004), and thus represents an average pre-existing background airborne cancer risk of 1.85 per million. Thus, the indoor air formaldehyde exposures describe above exacerbate this pre-existing risk resulting from outdoor air formaldehyde exposures.

Appendix A, Indoor Formaldehyde Concentrations and the CARB Formaldehyde ATCM, provides analyses that show utilization of CARB Phase 2 Formaldehyde ATCM materials will not ensure acceptable cancer risks with respect to formaldehyde emissions from composite wood products.

Even composite wood products manufactured with CARB certified ultra low emitting formaldehyde (ULEF) resins do not insure that the indoor air will have concentrations of

formaldehyde the meet the OEHHA cancer risks that substantially exceed 10 per million. The permissible emission rates for ULEF composite wood products are only 11-15% lower than the CARB Phase 2 emission rates. Only use of composite wood products made with no-added formaldehyde resins (NAF), such as resins made from soy, polyvinyl acetate, or methylene diisocyanate can insure that the OEHHA cancer risk of 10 per million is met.

The following describes a method that should be used, prior to construction in the environmental review under CEQA, for determining whether the indoor concentrations resulting from the formaldehyde emissions of specific building materials/furnishings selected exceed cancer and non-cancer guidelines. Such a design analyses can be used to identify those materials/furnishings prior to the completion of the City's CEQA review and project approval, that have formaldehyde emission rates that contribute to indoor concentrations that exceed cancer and non-cancer guidelines, so that alternative lower emitting materials/furnishings may be selected and/or higher minimum outdoor air ventilation rates can be increased to achieve acceptable indoor concentrations and incorporated as mitigation measures for this project.

Pre-Construction Building Material/Furnishing Formaldehyde Emissions Assessment

This formaldehyde emissions assessment should be used in the environmental review under CEQA to assess the indoor formaldehyde concentrations from the proposed loading of building materials/furnishings, the area-specific formaldehyde emission rate data for building materials/furnishings, and the design minimum outdoor air ventilation rates. This assessment allows the applicant (and the City) to determine, before the conclusion of the environmental review process and the building materials/furnishings are specified, purchased, and installed, if the total chemical emissions will exceed cancer and non-cancer guidelines, and if so, allow for changes in the selection of specific material/furnishings and/or the design minimum outdoor air ventilations rates such that cancer and non-cancer guidelines are not exceeded.

1.) Define Indoor Air Quality Zones. Divide the building into separate indoor air quality zones, (IAQ Zones). IAQ Zones are defined as areas of well-mixed air. Thus, each

ventilation system with recirculating air is considered a single zone, and each room or group of rooms where air is not recirculated (e.g. 100% outdoor air) is considered a separate zone. For IAQ Zones with the same construction material/furnishings and design minimum outdoor air ventilation rates. (e.g. hotel rooms, apartments, condominiums, etc.) the formaldehyde emission rates need only be assessed for a single IAQ Zone of that type.

2.) Calculate Material/Furnishing Loading. For each IAQ Zone, determine the building material and furnishing loadings (e.g., m^2 of material/ m^2 floor area, units of furnishings/ m^2 floor area) from an inventory of all potential indoor formaldehyde sources, including flooring, ceiling tiles, furnishings, finishes, insulation, sealants, adhesives, and any products constructed with composite wood products containing urea-formaldehyde resins (e.g., plywood, medium density fiberboard, particleboard).

3.) Calculate the Formaldehyde Emission Rate. For each building material, calculate the formaldehyde emission rate ($\mu\text{g}/\text{h}$) from the product of the area-specific formaldehyde emission rate ($\mu\text{g}/\text{m}^2\text{-h}$) and the area (m^2) of material in the IAQ Zone, and from each furnishing (e.g. chairs, desks, etc.) from the unit-specific formaldehyde emission rate ($\mu\text{g}/\text{unit-h}$) and the number of units in the IAQ Zone.

NOTE: As a result of the high-performance building rating systems and building codes (California Building Standards Commission, 2014; USGBC, 2014), most manufacturers of building materials furnishings sold in the United States conduct chemical emission rate tests using the California Department of Health “Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions for Indoor Sources Using Environmental Chambers,” (CDPH, 2017), or other equivalent chemical emission rate testing methods. Most manufacturers of building furnishings sold in the United States conduct chemical emission rate tests using ANSI/BIFMA M7.1 Standard Test Method for Determining VOC Emissions (BIFMA, 2018), or other equivalent chemical emission rate testing methods.

CDPH, BIFMA, and other chemical emission rate testing programs, typically certify that a material or furnishing does not create indoor chemical concentrations in excess of the

maximum concentrations permitted by their certification. For instance, the CDPH emission rate testing requires that the measured emission rates when input into an office, school, or residential model do not exceed one-half of the OEHHA Chronic Exposure Guidelines (OEHHA, 2017b) for the 35 specific VOCs, including formaldehyde, listed in Table 4-1 of the CDPH test method (CDPH, 2017). These certifications themselves do not provide the actual area-specific formaldehyde emission rate (i.e., $\mu\text{g}/\text{m}^2\text{-h}$) of the product, but rather provide data that the formaldehyde emission rates do not exceed the maximum rate allowed for the certification. Thus, for example, the data for a certification of a specific type of flooring may be used to calculate that the area-specific emission rate of formaldehyde is less than $31 \mu\text{g}/\text{m}^2\text{-h}$, but not the actual measured specific emission rate, which may be 3, 18, or $30 \mu\text{g}/\text{m}^2\text{-h}$. These area-specific emission rates determined from the product certifications of CDPH, BIFA, and other certification programs can be used as an initial estimate of the formaldehyde emission rate.

If the actual area-specific emission rates of a building material or furnishing is needed (i.e. the initial emission rates estimates from the product certifications are higher than desired), then that data can be acquired by requesting from the manufacturer the complete chemical emission rate test report. For instance if the complete CDPH emission test report is requested for a CDHP certified product, that report will provide the actual area-specific emission rates for not only the 35 specific VOCs, including formaldehyde, listed in Table 4-1 of the CDPH test method (CDPH, 2017), but also all of the cancer and reproductive/developmental chemicals listed in the California Proposition 65 Safe Harbor Levels (OEHHA, 2017a), all of the toxic air contaminants (TACs) in the California Air Resources Board Toxic Air Contamination List (CARB, 2011), and the 10 chemicals with the greatest emission rates.

Alternatively, a sample of the building material or furnishing can be submitted to a chemical emission rate testing laboratory, such as Berkeley Analytical Laboratory (<https://berkeleyanalytical.com>), to measure the formaldehyde emission rate.

4.) Calculate the Total Formaldehyde Emission Rate. For each IAQ Zone, calculate the total formaldehyde emission rate (i.e. $\mu\text{g}/\text{h}$) from the individual formaldehyde emission

rates from each of the building material/furnishings as determined in Step 3.

5.) Calculate the Indoor Formaldehyde Concentration. For each IAQ Zone, calculate the indoor formaldehyde concentration ($\mu\text{g}/\text{m}^3$) from Equation 1 by dividing the total formaldehyde emission rates (i.e. $\mu\text{g}/\text{h}$) as determined in Step 4, by the design minimum outdoor air ventilation rate (m^3/h) for the IAQ Zone.

$$C_{in} = \frac{E_{total}}{Q_{oa}} \quad (\text{Equation 1})$$

where:

C_{in} = indoor formaldehyde concentration ($\mu\text{g}/\text{m}^3$)

E_{total} = total formaldehyde emission rate ($\mu\text{g}/\text{h}$) into the IAQ Zone.

Q_{oa} = design minimum outdoor air ventilation rate to the IAQ Zone (m^3/h)

The above Equation 1 is based upon mass balance theory, and is referenced in Section 3.10.2 “Calculation of Estimated Building Concentrations” of the California Department of Health “Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions for Indoor Sources Using Environmental Chambers”, (CDPH, 2017).

6.) Calculate the Indoor Exposure Cancer and Non-Cancer Health Risks. For each IAQ Zone, calculate the cancer and non-cancer health risks from the indoor formaldehyde concentrations determined in Step 5 and as described in the OEHHA Air Toxics Hot Spots Program Risk Assessment Guidelines; Guidance Manual for Preparation of Health Risk Assessments (OEHHA, 2015).

7.) Mitigate Indoor Formaldehyde Exposures of exceeding the CEQA Cancer and/or Non-Cancer Health Risks. In each IAQ Zone, provide mitigation for any formaldehyde exposure risk as determined in Step 6, that exceeds the CEQA cancer risk of 10 per million or the CEQA non-cancer Hazard Quotient of 1.0.

Provide the source and/or ventilation mitigation required in all IAQ Zones to reduce the health risks of the chemical exposures below the CEQA cancer and non-cancer health risks.

Source mitigation for formaldehyde may include:

- 1.) reducing the amount materials and/or furnishings that emit formaldehyde
- 2.) substituting a different material with a lower area-specific emission rate of formaldehyde

Ventilation mitigation for formaldehyde emitted from building materials and/or furnishings may include:

- 1.) increasing the design minimum outdoor air ventilation rate to the IAQ Zone.

NOTE: Mitigating the formaldehyde emissions through use of less material/furnishings, or use of lower emitting materials/furnishings, is the preferred mitigation option, as mitigation with increased outdoor air ventilation increases initial and operating costs associated with the heating/cooling systems.

Further, we are not asking that the builder “speculate” on what and how much composite materials be used, but rather at the design stage to select composite wood materials based on the formaldehyde emission rates that manufacturers routinely conduct using the California Department of Health “Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions for Indoor Sources Using Environmental Chambers,” (CDPH, 2017), and use the procedure described earlier above (i.e. Pre-Construction Building Material/Furnishing Formaldehyde Emissions Assessment) to insure that the materials selected achieve acceptable cancer risks from material off gassing of formaldehyde.

Outdoor Air Ventilation Impact. Another important finding of the CNHS, was that the outdoor air ventilation rates in the homes were very low. Outdoor air ventilation is a very important factor influencing the indoor concentrations of air contaminants, as it is the primary removal mechanism of all indoor air generated contaminants. Lower outdoor air exchange rates cause indoor generated air contaminants to accumulate to higher indoor air concentrations. Many homeowners rarely open their windows or doors for ventilation as a result of their concerns for security/safety, noise, dust, and odor concerns (Price, 2007). In

the CNHS field study, 32% of the homes did not use their windows during the 24-hour Test Day, and 15% of the homes did not use their windows during the entire preceding week. Most of the homes with no window usage were homes in the winter field session. Thus, a substantial percentage of homeowners never open their windows, especially in the winter season. The median 24-hour measurement was 0.26 air changes per hour (ach), with a range of 0.09 ach to 5.3 ach. A total of 67% of the homes had outdoor air exchange rates below the minimum California Building Code (2001) requirement of 0.35 ach. Thus, the relatively tight envelope construction, combined with the fact that many people never open their windows for ventilation, results in homes with low outdoor air exchange rates and higher indoor air contaminant concentrations.

According to the Draft Subsequent Environmental Impact Report – Lawrence Station Area Olan Update/Intuitive Surgical Corporate Campus Project, Sunnyvale, CA (Ascent Environmental, 2021), the Project is close to roads with moderate to high traffic (e.g., Kifer Road, Lawrence Expressway, Althea Terrace, etc.).

In Table 3.11-8 of the Draft Subsequent Environmental Impact Report, the modeled existing plus buildout traffic noise levels range from 65.2 to 75.2 dBA Ldn.

In order to design the building for this Project such that interior noise levels are acceptable, an acoustic study with actual on-site measurements of the existing ambient noise levels and modeled future ambient noise levels needs to be conducted. The acoustic study of the existing ambient noise levels should be conducted over a one-week period. and report the dBA CNEL or Ldn. This study will allow for the selection of a building envelope and windows with a sufficient STC such that the indoor noise levels are acceptable. A mechanical supply of outdoor air ventilation to allow for a habitable interior environment with closed windows and doors will also be requires. Such a ventilation system would allow windows and doors to be kept closed at the occupant's discretion to control exterior noise within building interiors.

PM_{2.5} Outdoor Concentrations Impact. An additional impact of the nearby motor vehicle traffic associated with this project, are the outdoor concentrations of PM_{2.5}.

According to the Draft Subsequent Environmental Impact Report – Lawrence Station Area Olan Update/Intuitive Surgical Corporate Campus Project, Sunnyvale, CA (Ascent Environmental, 2021) the Project is located in the San Francisco Bay Area Basin, which is a State and Federal non-attainment area for PM_{2.5}.

An air quality analyses should be conducted to determine the concentrations of PM_{2.5} in the outdoor and indoor air that people inhale each day. This air quality analyses needs to consider the cumulative impacts of the project related emissions, existing and projected future emissions from local PM_{2.5} sources (e.g., stationary sources, motor vehicles, and airport traffic) upon the outdoor air concentrations at the Project site. If the outdoor concentrations are determined to exceed the California and National annual average PM_{2.5} exceedence concentration of 12 µg/m³, or the National 24-hour average exceedence concentration of 35 µg/m³, then the buildings need to have a mechanical supply of outdoor air that has air filtration with sufficient removal efficiency, such that the indoor concentrations of outdoor PM_{2.5} particles is less than the California and National PM_{2.5} annual and 24-hour standards.

It is my experience that based on the projected high traffic noise levels, the annual average concentration of PM_{2.5} will exceed the California and National PM_{2.5} annual and 24-hour standards and warrant installation of high efficiency air filters (i.e., MERV 13, or possibly MERV 14 or MERV 15) in all mechanically supplied outdoor air ventilation systems.

Indoor Air Quality Impact Mitigation Measures

The following are recommended mitigation measures to minimize the impacts upon indoor quality:

Indoor Formaldehyde Concentrations Mitigation. Use only composite wood materials (e.g. hardwood plywood, medium density fiberboard, particleboard) for all interior finish systems that are made with CARB approved no-added formaldehyde (NAF) resins (CARB, 2009). CARB Phase 2 certified composite wood products, or ultra-low emitting formaldehyde (ULEF) resins, do not insure indoor formaldehyde concentrations that are

below the CEQA cancer risk of 10 per million. Only composite wood products manufactured with CARB approved no-added formaldehyde (NAF) resins, such as resins made from soy, polyvinyl acetate, or methylene diisocyanate can insure that the OEHHA cancer risk of 10 per million is met.

Alternatively, conduct the previously described Pre-Construction Building Material/Furnishing Chemical Emissions Assessment, to determine that the combination of formaldehyde emissions from building materials and furnishings do not create indoor formaldehyde concentrations that exceed the CEQA cancer and non-cancer health risks.

It is important to note that we are not asking that the builder “speculate” on what and how much composite materials be used, but rather at the design stage to select composite wood materials based on the formaldehyde emission rates that manufacturers routinely conduct using the California Department of Health “Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions for Indoor Sources Using Environmental Chambers”, (CDPH, 2017), and use the procedure described above (i.e. Pre-Construction Building Material/Furnishing Formaldehyde Emissions Assessment) to insure that the materials selected achieve acceptable cancer risks from material off gassing of formaldehyde.

Outdoor Air Ventilation Mitigation. Provide each habitable room with a continuous mechanical supply of outdoor air that meets or exceeds the California 2016 Building Energy Efficiency Standards (California Energy Commission, 2015) requirements of the greater of 15 cfm/occupant or 0.15 cfm/ft² of floor area. Following installation of the system conduct testing and balancing to insure that required amount of outdoor air is entering each habitable room and provide a written report documenting the outdoor airflow rates. Do not use exhaust only mechanical outdoor air systems, use only balanced outdoor air supply and exhaust systems or outdoor air supply only systems. Provide a manual for the occupants or maintenance personnel, that describes the purpose of the mechanical outdoor air system and the operation and maintenance requirements of the system.

PM_{2.5} Outdoor Air Concentration Mitigation. Install air filtration with sufficient PM_{2.5} removal efficiency (e.g. MERV 13 or higher) to filter the outdoor air entering the mechanical outdoor air supply systems, such that the indoor concentrations of outdoor PM_{2.5} particles are less than the California and National PM_{2.5} annual and 24-hour standards. Install the air filters in the system such that they are accessible for replacement by the occupants or maintenance personnel. Include in the mechanical outdoor air ventilation system manual instructions on how to replace the air filters and the estimated frequency of replacement.

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APPENDIX A

INDOOR FORMALDEHYDE CONCENTRATIONS
AND THE
CARB FORMALDEHYDE ATCM

With respect to formaldehyde emissions from composite wood products, the CARB ATCM regulations of formaldehyde emissions from composite wood products, do not assure healthful indoor air quality. The following is the stated purpose of the CARB ATCM regulation - *The purpose of this airborne toxic control measure is to “reduce formaldehyde emissions from composite wood products, and finished goods that contain composite wood products, that are sold, offered for sale, supplied, used, or manufactured for sale in California”*. In other words, the CARB ATCM regulations do not “assure healthful indoor air quality”, but rather “reduce formaldehyde emissions from composite wood products”.

Just how much protection do the CARB ATCM regulations provide building occupants from the formaldehyde emissions generated by composite wood products? Definitely some, but certainly the regulations do not “*assure healthful indoor air quality*” when CARB Phase 2 products are utilized. As shown in the Chan 2019 study of new California homes, the median indoor formaldehyde concentration was of $22.4 \mu\text{g}/\text{m}^3$ (18.2 ppb), which corresponds to a cancer risk of 112 per million for occupants with continuous exposure, which is more than 11 times the CEQA cancer risk of 10 per million.

Another way of looking at how much protection the CARB ATCM regulations provide building occupants from the formaldehyde emissions generated by composite wood products is to calculate the maximum number of square feet of composite wood product that can be in a residence without exceeding the CEQA cancer risk of 10 per million for occupants with continuous occupancy.

For this calculation I utilized the floor area ($2,272 \text{ ft}^2$), the ceiling height (8.5 ft), and the number of bedrooms (4) as defined in Appendix B (New Single-Family Residence Scenario) of the Standard Method for the Testing and Evaluation of Volatile Organic Chemical

Emissions for Indoor Sources Using Environmental Chambers, Version 1.1, 2017, California Department of Public Health, Richmond, CA. <https://www.cdph.ca.gov/Programs/CCDPHP/DEODC/EHLB/IAQ/Pages/VOC.aspx>.

For the outdoor air ventilation rate I used the 2019 Title 24 code required mechanical ventilation rate (ASHRAE 62.2) of 106 cfm (180 m³/h) calculated for this model residence. For the composite wood formaldehyde emission rates I used the CARB ATCM Phase 2 rates.

The calculated maximum number of square feet of composite wood product that can be in a residence, without exceeding the CEQA cancer risk of 10 per million for occupants with continuous occupancy are as follows for the different types of regulated composite wood products.

Medium Density Fiberboard (MDF) – 15 ft² (0.7% of the floor area), or
Particle Board – 30 ft² (1.3% of the floor area), or
Hardwood Plywood – 54 ft² (2.4% of the floor area), or
Thin MDF – 46 ft² (2.0 % of the floor area).

For offices and hotels the calculated maximum amount of composite wood product (% of floor area) that can be used without exceeding the CEQA cancer risk of 10 per million for occupants, assuming 8 hours/day occupancy, and the California Mechanical Code minimum outdoor air ventilation rates are as follows for the different types of regulated composite wood products.

Medium Density Fiberboard (MDF) – 3.6 % (offices) and 4.6% (hotel rooms), or
Particle Board – 7.2 % (offices) and 9.4% (hotel rooms), or
Hardwood Plywood – 13 % (offices) and 17% (hotel rooms), or
Thin MDF – 11 % (offices) and 14 % (hotel rooms)

Clearly the CARB ATCM does not regulate the formaldehyde emissions from composite wood products such that the potentially large areas of these products, such as for flooring,

baseboards, interior doors, window and door trims, and kitchen and bathroom cabinetry, could be used without causing indoor formaldehyde concentrations that result in CEQA cancer risks that substantially exceed 10 per million for occupants with continuous occupancy.

Even composite wood products manufactured with CARB certified ultra low emitting formaldehyde (ULEF) resins do not insure that the indoor air will have concentrations of formaldehyde that meet the OEHHA cancer risks that substantially exceed 10 per million. The permissible emission rates for ULEF composite wood products are only 11-15% lower than the CARB Phase 2 emission rates. Only use of composite wood products made with no-added formaldehyde resins (NAF), such as resins made from soy, polyvinyl acetate, or methylene diisocyanate can insure that the OEHHA cancer risk of 10 per million is met.

If CARB Phase 2 compliant or ULEF composite wood products are utilized in construction, then the resulting indoor formaldehyde concentrations should be determined in the design phase using the specific amounts of each type of composite wood product, the specific formaldehyde emission rates, and the volume and outdoor air ventilation rates of the indoor spaces, and all feasible mitigation measures employed to reduce this impact (e.g. use less formaldehyde containing composite wood products and/or incorporate mechanical systems capable of higher outdoor air ventilation rates). See the procedure described earlier (i.e. Pre-Construction Building Material/Furnishing Formaldehyde Emissions Assessment) to insure that the materials selected achieve acceptable cancer risks from material off gassing of formaldehyde.

Alternatively, and perhaps a simpler approach, is to use only composite wood products (e.g. hardwood plywood, medium density fiberboard, particleboard) for all interior finish systems that are made with CARB approved no-added formaldehyde (NAF) resins.