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**Re: 2110 Bay Street Mixed Use Project (SCH2017031007)
Case No. VTT-74564-1A**

Honorable Members of the Planning Commission:

I am writing on behalf of the Supporters Alliance for Environmental Responsibility and its members living and/or working in the City of Los Angeles ("SAFER"), regarding the Environmental Impact Report; ("EIR") prepared for the 2110 Bay Street Mixed Use Project aka SCH2017031007 including all actions related or referring to the proposed new residential and commercial development including 110 live/work apartment units (67 studio units, 34 1-bedroom units, and 9 2-bedroom units), 113,350 square feet of creative office space, and 50,848 square feet of new commercial space that may include commercial retail, and/or restaurant floor area located at 2100, 2130 Bay Street and 2141 Sacramento Street in the City of Los Angeles on APNs: 5166-005-005, 011, and 014 ("Project").

For the reasons explained below, SAFER requests that the City of Los Angeles ("City") prepare a Revised Draft Environmental Impact Report ("RDEIR") to analyze and mitigate impacts that have not been adequately addressed in the Draft Environmental Impact Report ("DEIR") that has been circulated. The Project will have significant impacts that must be analyzed and mitigated in a RDEIR.

I. Legal Background

CEQA requires that an agency analyze the potential environmental impacts of its proposed actions in an environmental impact report ("EIR") (except in certain limited

circumstances). (See, e.g., Pub. Res. Code § 21100.) The EIR is the very heart of CEQA. (*Dunn-Edwards v. BAAQMD* (1992) 9 Cal.App.4th 644, 652.) “The ‘foremost principle’ in interpreting CEQA is that the Legislature intended the act to be read so as to afford the fullest possible protection to the environment within the reasonable scope of the statutory language.” (*Communities for a Better Environment v. Calif. Resources Agency* (2002) 103 Cal. App. 4th 98, 109.)

CEQA has two primary purposes. First, CEQA is designed to inform decision makers and the public about the potential, significant environmental effects of a project. (14 Cal. Code Regs. (“CEQA Guidelines”) § 15002(a)(1).) “Its purpose is to inform the public and its responsible officials of the environmental consequences of their decisions before they are made. Thus, the EIR ‘protects not only the environment but also informed self-government.’” (*Citizens of Goleta Valley v. Board of Supervisors* (1990) 52 Cal. 3d 553, 564) The EIR has been described as “an environmental ‘alarm bell’ whose purpose it is to alert the public and its responsible officials to environmental changes before they have reached ecological points of no return.” (*Berkeley Keep Jets Over the Bay v. Bd. of Port Comm’rs.* (2001) 91 Cal. App. 4th 1344, 1354 (“Berkeley Jets”); *County of Inyo v. Yorty* (1973) 32 Cal.App.3d 795, 810)

Second, CEQA requires public agencies to avoid or reduce environmental damage when “feasible” by requiring “environmentally superior” alternatives and all feasible mitigation measures. (CEQA Guidelines § 15002(a)(2) and (3); See also, *Berkeley Jets*, 91 Cal. App. 4th 1344, 1354; *Citizens of Goleta Valley v. Board of Supervisors* (1990) 52 Cal.3d 553, 564) The EIR serves to provide agencies and the public with information about the environmental impacts of a proposed project and to “identify ways that environmental damage can be avoided or significantly reduced.” (Guidelines §15002(a)(2)) If the project will have a significant effect on the environment, the agency may approve the project only if it finds that it has “eliminated or substantially lessened all significant effects on the environment where feasible” and that any unavoidable significant effects on the environment are “acceptable due to overriding concerns.” (Pub.Res.Code § 21081; 14 Cal.Code Regs. § 15092(b)(2)(A) & (B)) The lead agency may deem a particular impact to be insignificant only if it produces rigorous analysis and concrete substantial evidence justifying the finding. (*Kings County Farm Bureau v. City of Hanford* (1990) 221 Cal.App.3d 692, 732 (Cal. App. 5th Dist. 1990)).

While the courts review an EIR using an “abuse of discretion” standard, “the reviewing court is not to ‘uncritically rely on every study or analysis presented by a project proponent in support of its position. A ‘clearly inadequate or unsupported study is entitled to no judicial deference.’” (*Berkeley Jets*, 91 Cal. App. 4th 1344, 1355 (emphasis added), quoting, *Laurel Heights Improvement Assn. v. Regents of University of California*, 47 Cal. 3d 376, 391 409, fn. 12 (1988)) As the court stated in *Berkeley Jets*, 91 Cal. App. 4th at 1355:

A prejudicial abuse of discretion occurs “if the failure to include relevant information precludes informed decisionmaking and informed public participation, thereby thwarting the statutory goals of the EIR process.” (*San Joaquin Raptor/Wildlife Rescue Center v. County of Stanislaus* (1994) 27 Cal. App. 4th 713, 722]; *Galante*

Vineyards v. Monterey Peninsula Water Management Dist. (1997) 60 Cal. App. 4th 1109, 1117; *County of Amador v. El Dorado County Water Agency* (1999) 76 Cal. App. 4th 931, 946)

Court must use their independent judgment to review the adequacy of the EIR as an informational document. *Sierra Club v. County of Fresno*, 6 Cal. 5th 502, 515, 431 P.3d 1151, 1161 (2018).

II. Analysis

A. The EIR Fails to Establish a Baseline for Potentially Hazards Chemicals at the Project Site and Fails to Analyze Potential Impacts.

SAFER is concerned that the EIR fails to adequately analyze potential risks related to soil contamination. The Project site is located in an industrial area. Due to historic industrial uses, the Project site has been contaminated with toxic chemicals.

The DEIR explains, (DEIR, p. IV.E-10):

Unidentified piping that may be indicative of the presence of underground storage tanks was noted at two locations, one along the north-central edge of the site, adjacent to the warehouse building, and one location adjacent to the northwestern corner of the shop building. Additionally, the site was listed on a Historical Underground Storage Tank list.

Abandoned paint cans and an apparently drained-in-place solvent can were noted in the south part of the shop building, irregular flooring that suggested the presence of an abandoned service pit was noted in the central part of the shop building, and a floor-drain was noted within the northern portion of the shop building. It appeared the drain had been associated with former vehicle-type washing operations. A circular patch was noted in the pavement surface adjacent to the drain. This feature may be indicative of previous soil-sampling activities at this location. However, no prior data has been provided for review.

An abandoned railroad spur abuts the site's western boundary. Siding along the west face of the warehouse building was irregular in color and apparent age. This finding may be indicative of former warehouse doors adjacent to the railroad tracks. Additionally, rigging associated with a 3-ton overhead crane system was present in the warehouse building. These observations suggest former industrial activities may have occurred at the site, prior to use for a towtruck/ equipment-moving yard.

Also, several instances of significant/long-term surface stains were noted, apparently related to leaked automotive fluids, and multiple abandoned fuel canisters were present, inside the warehouse building. Each of the above-described observations was deemed to represent a potential environmental concern for the property.

The adjacent-east property formerly was occupied by a chemical warehouse. While not a "listed property" in the EDR Radius Report, the proximity and nature of former operations on this adjacent property make vapor-based migration of contamination, if present on the adjacent land, a potential concern.

Due to the extensive evidence of soil contamination, the California Department of Toxic Substances Control ("DTSC") submitted comments on the EIR. DTSC stated, "The draft EIR needs to identify any known or potentially contaminated site within the proposed project area. For all identified sites, the draft EIR needs to evaluate whether conditions at the site pose a threat to human health or the environment." (FEIR, p. II-4). DTSC also stated, "The draft EIR should identify the mechanism to initiate any required investigation and/or remediation for any site that may require remediation, and which government agency will provide appropriate regulatory oversight." (FEIR p. II-5).

In response to DTSC's comments, the FEIR merely states that if contaminated soil is discovered, "construction of the Project would be required to comply with applicable regulations concerning the release and handling of hazardous substances, as well as the applicable federal and State regulations governing transport, storage, and use of hazardous materials." (FEIR, p. II-6).

This response to an expert agency is inadequate. Under CEQA, the clean-up plan must be set forth in the EIR so that the public may analyze the plan and determine its adequacy. The agency may not defer development of the plan under after project approval.

DTSC has determined that the "draft EIR needs to evaluate whether conditions at the site pose a threat to human health or the environment." (FEIR, p. II-4). However, the EIR proposes to develop mitigation measures in the future rather than proposing specific, feasible mitigation measures. This violates CEQA. CEQA requires that mitigation measures be set forth in the CEQA document so that the public can review and comment on their adequacy or inadequacy. *Citizens for Responsible Equitable Env't'l Dev. v. City of Chula Vista* ("CREED") (2011) 197 Cal.App.4th 327, 332.

The City proposes that mitigation measures will not be developed until after project approval, in violation of CEQA. As the Court of Appeal stated, "[R]eliance on tentative plans for future mitigation after completion of the CEQA process significantly undermines CEQA's goals of full disclosure and informed decisionmaking; and[,] consequently, these mitigation plans have been overturned on judicial review as constituting improper deferral of environmental assessment." *Communities for a Better Environment v. City of Richmond* ("CBE v. Richmond") (2010) 184 Cal.App.4th at 92.

The EIR's deferred mitigation measure is very similar to *CREED*. In *CREED*, a developer proposed to build a shopping center on a contaminated site, but proposed to develop a clean-up plan after project approval. The court held that this was improper deferred mitigation. In *CREED*, the city stated that a "corrective action plan" would be used to remediate soil and groundwater contamination at the Target store project site, but

failed to include the plan in the Project MND and administrative record. 197 Cal.App.4th at 331-32. The court held that the mere absence of the corrective action plan from the administrative record rendered the MND insufficient under CEQA, and created a “fair[] argu[ment] that the project may have a significant impact by disturbing contaminated soils.” *Id.* at 332. The court held that mitigation measures must be identified prior to Project approval. *Id.* at 331-32.

A RDEIR is required to analyze the admittedly significant soil contamination, and to propose specific mitigation measures that will ensure the adequate clean-up of the Project site prior to Project approval.

B. The EIR Fails to Analyze Indoor Air Quality Impacts from Formaldehyde.

The Project will expose future residents to significant impacts related to indoor air quality, and in particular, emissions for the cancer-causing chemical formaldehyde. Many composite wood products typically used in modern home construction contain formaldehyde-based glues which off-gas formaldehyde over a very long time period. (See, Chan, Exhibit A). The primary source formaldehyde indoors is composite wood products manufactured with urea-formaldehyde resins, such as plywood, medium density fiberboard, and particle board. These materials are commonly used in residential building construction for flooring, cabinetry, baseboards, window shades, interior doors, and window and door trims.

Formaldehyde is a known human carcinogen. There is a fair argument that residents of the Project will be exposed to a cancer risk from formaldehyde above the South Coast Air Quality Management District (SCAQMD) CEQA significance threshold for airborne cancer risk of 10 per million. Even if the Project uses modern “CARB-compliant” materials, formaldehyde will create a cancer risk more than ten times above the CEQA significance threshold. (Exhibit A). This significant environmental impact should be analyzed in an EIR and mitigation measures should be imposed to reduce the risk of formaldehyde exposure.

The failure of the EIR to address the Project’s formaldehyde emissions is contrary to the California Supreme Court’s decision in *California Building Industry Ass’n v. Bay Area Air Quality Mgmt. Dist.* (2015) 62 Cal.4th 369, 386 (“*CBIA*”). In that case, the Supreme Court expressly held that potential adverse impacts to future users and residents from pollution generated by a proposed project must be addressed under CEQA. At issue in *CBIA* was whether the Air District could enact CEQA guidelines that advised lead agencies that they must analyze the impacts of adjacent environmental conditions on a project. The Supreme Court held that CEQA does not generally require lead agencies to consider the environment’s effects on a project. (*CBIA*, 62 Cal.4th at 800-801.) However, to the extent a project may exacerbate existing environmental conditions at or near a project site, those would still have to be considered pursuant to CEQA. (*Id.* at 801.) In so holding, the Court expressly held that CEQA’s statutory language required lead agencies to disclose and analyze “impacts on a project’s users or residents that arise from the project’s effects on the environment.” (*Id.* at 800 (emphasis added).)

The carcinogenic formaldehyde emissions are not an existing environmental condition. Those emissions to the air will be from the Project. People will be residing in and using the Project once it is built and begins emitting formaldehyde. Once built, the Project will begin to emit formaldehyde at levels that pose significant health risks. The Supreme Court in CBIA expressly finds that this type of air emission and health impact by the project on the environment and a “project’s users and residents” must be addressed in the CEQA process.

The Supreme Court’s reasoning is well-grounded in CEQA’s statutory language. CEQA expressly includes a project’s effects on human beings as an effect on the environment that must be addressed in an environmental review. “Section 21083(b)(3)’s express language, for example, requires a finding of a ‘significant effect on the environment’ (§ 21083(b)) whenever the ‘environmental effects of a project will cause substantial adverse effects on human beings, either directly or indirectly.’” (CBIA, 62 Cal.4th at 800 (emphasis in original.)) Likewise, “the Legislature has made clear—in declarations accompanying CEQA’s enactment—that public health and safety are of great importance in the statutory scheme.” (Id., citing e.g., §§ 21000, subds. (b), (c), (d), (g), 21001, subds. (b), (d).) It goes without saying that the hundreds of future residents at the Project are human beings and the health and safety of those residents is as important to CEQA’s safeguards as nearby residents currently living adjacent to the Project site.

When a Project exceeds a duly adopted CEQA significance threshold, as here, this alone establishes a fair argument that the project will have a significant adverse environmental impact and an EIR is required. Indeed, in many instances, such air quality thresholds are the only criteria reviewed and treated as dispositive in evaluating the significance of a project’s air quality impacts. (See, e.g. *Schenck v. County of Sonoma* (2011) 198 Cal.App.4th 949, 960 [County applies BAAQMD’s “published CEQA quantitative criteria” and “threshold level of cumulative significance”]; see also, *Communities for a Better Environment v. California Resources Agency* (2002) 103 Cal.App.4th 98, 110-111 [“A ‘threshold of significance’ for a given environmental effect is simply that level at which the lead agency finds the effects of the project to be significant.”].) The California Supreme Court made clear the substantial importance that an air district significance threshold plays in providing substantial evidence of a significant adverse impact. (*Communities for a Better Environment v. South Coast Air Quality Management Dist.* (2010) 48 Cal.4th 310, 327 [“As the [South Coast Air Quality Management] District’s established significance threshold for NOx is 55 pounds per day, these estimates [of NOx emissions of 201 to 456 pounds per day] constitute substantial evidence supporting a fair argument for a significant adverse impact.”].) Since expert evidence demonstrates that the Project will exceed the BAAQMD’s CEQA significance threshold, there is a fair argument that the Project will have a significant adverse effect. Because this potential significant effect was not addressed at all in the FEIR, the FEIR fails as an informational document and fails to provide substantial evidence that there will not be significant impacts on human health due to indoor air pollution emissions.

There are several feasible mitigation measures, such as requiring the use of no-added-formaldehyde composite wood products, which are readily available. Since the EIR

does not analyze this impact at all, none of these or other mitigation measures are considered.

C. The EIR Fails to Adequately Analyze the Project's Public Service Impacts.

LA Sanitation submitted comments on the Project stating that "it appears the sewer system might be able to accommodate the total flow for the project." (FEIR, p. II-18). In response, the FEIR states, "If the public sewer has insufficient capacity, then the Project Applicant shall be required to build improvements to convey wastewater to a point in the sewer system with sufficient capacity. A final approval for sewer capacity and connection permit would be made at that time." Id. Thus, the EIR states that the adequacy of inadequacy of sewer capacity will be determined at a later time, after Project approval, and at that time it may be necessary "to build improvements to convey wastewater." CEQA expressly prohibits such deferred mitigation.

Feasible mitigation measures for significant environmental effects must be set forth in an EIR for consideration by the lead agency's decision makers and the public before certification of the EIR and approval of a project. The formulation of mitigation measures generally cannot be deferred until after certification of the EIR and approval of a project. Guidelines, section 15126.4(a)(1)(B) states: "Formulation of mitigation measures should not be deferred until some future time. However, measures may specify performance standards which would mitigate the significant effect of the project and which may be accomplished in more than one specified way."

"A study conducted after approval of a project will inevitably have a diminished influence on decisionmaking. Even if the study is subject to administrative approval, it is analogous to the sort of post hoc rationalization of agency actions that has been repeatedly condemned in decisions construing CEQA." (*Sundstrom v. County of Mendocino* (1988) 202 Cal.App.3d 296, 307.) "[R]eliance on tentative plans for future mitigation after completion of the CEQA process significantly undermines CEQA's goals of full disclosure and informed decisionmaking; and[,] consequently, these mitigation plans have been overturned on judicial review as constituting improper deferral of environmental assessment." (*Communities for a Better Environment v. City of Richmond* (2010) 184 Cal.App.4th 70, 92.)

"Deferral of the specifics of mitigation is permissible where the local entity commits itself to mitigation and lists the alternatives to be considered, analyzed and possibly incorporated in the mitigation plan. [Citation.] On the other hand, an agency goes too far when it simply requires a project applicant to obtain a biological [or other] report and then comply with any recommendations that may be made in the report." (*Defend the Bay v. City of Irvine* (2004) 119 Cal.App.4th 1261, 1275.) "If mitigation is feasible but impractical at the time of a general plan or zoning amendment, it is sufficient to articulate specific performance criteria and make further approvals contingent on finding a way to meet them." (*Endangered Habitats League, Inc. v. County of Orange* (2005) 131 Cal.App.4th 777, 793.)

The present situation is very similar to the *Sundstrom* case, *supra*. In *Sundstrom*, the agency approved a hotel project. It was unclear how the sewage would be handled for the hotel, but the CEQA document stated that the sewage system would be designed at a later time. The court rejected this approach, stating that the sewer issue had to be addressed in the EIR, since the construction and adequacy of the sewer system may themselves create environmental impacts.

A revised DEIR should be prepared to analyze and mitigate the Project's sewer impacts, and to address other public service impacts such as police, fire, schools, etc.

D. The Project is Inconsistent with the General Plan.

The site is currently designated for Heavy Manufacturing in the General Plan and applicable zoning. (DEIR, p. 1-2.) Framework Element Policy 7.2.8 provides that the City must "[r]etain the current manufacturing and industrial land use designations." Yet, the Project, if approved, would permanently remove land currently designated for industrial uses and convert this land to commercial and residential zoning. Project approval is also completely inconsistent with Policy 7.2.9's mandate to "[l]imit the redesignation of existing industrial land to other land uses," as it would redesignate industrial land as commercial and residential land. (See DEIR, p. 11-14 [changing the zoning from M3-1-RIO, a Heavy Industrial designation, to CM-2-RIO, a Commercial Manufacturing designation].) In addition, Framework Element Policy 13.4.6 only permits conversion of industrial land to non-industrial uses, "[w]here it can be demonstrated that the reduction of industrial lands will not adversely impact the City's ability to accommodate sufficient industrial uses to provide jobs for the City's residents or incur adverse fiscal impacts."

Though Project approval will result in the permanent loss of industrial uses, (see generally DEIR, pp. I-5, I-6), the DEIR contains no evidence that this will not adversely impact the City's ability to accommodate sufficient industrial uses or incur adverse financial impacts (see generally DEIR Section IV.G).

Where a local or regional policy of general applicability, such as an ordinance, is adopted in order to avoid or mitigate environmental effects, a conflict with that policy in itself indicates a potentially significant impact on the environment. (*Pocket Protectors v. Sacramento* (2005) 124 Cal.App.4th 903.) Indeed, any inconsistencies between a proposed project and applicable plans must be discussed in an EIR. (14 CCR § 15125(d); *City of Long Beach v. Los Angeles Unif. School Dist.* (2009) 176 Cal. App. 4th 889, 918; *Friends of the Eel River v. Sonoma County Water Agency* (2003) 108 Cal. App. 4th 859, 874 (EIR inadequate when Lead Agency failed to identify relationship of project to relevant local plans).) A Project's inconsistencies with local plans and policies constitute significant impacts under CEQA. (*Endangered Habitats League, Inc. v. County of Orange* (2005) 131 Cal.App.4th 777, 783-4, 32 Cal.Rptr.3d 177; see also, *County of El Dorado v. Dept. of Transp.* (2005) 133 Cal.App.4th 1376 (fact that a project may be consistent with a plan, such as an air plan, does not necessarily mean that it does not have significant impacts).) *Californians for Alternatives to Toxics v. Department of Food and Agriculture* (2005) 136 Ca1.App.4th 1, 17 ("[c]ompliance with the law is not enough to

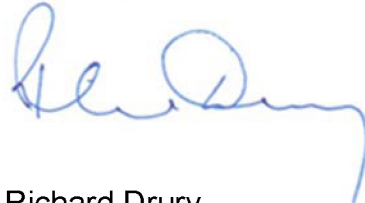
support a finding of no significant impact under the CEQA.”). Therefore the General Plan inconsistencies create significant impacts under CEQA.

Furthermore, the City must comply with its General Plan. The “propriety of virtually any local decision affecting land use and development depends upon consistency with the applicable general plan and its elements.” (*Citizens of Goleta Valley v. Bd. of Sups.* (1990) 52 C.3d 553, 570). The “critical factors” are “the nature of the policies and the nature of the inconsistency;” and it should not simply defer to the City’s interpretation. *Id.* The specific General Plan policies at issue in this case are clear and mandatory policies. (*San Bernardino County Audubon Society, Inc. v. County of San Bernardino* (1984) 155 Cal.App.3d 738, 753). Since the Project fails to comply with the General Plan, it may not be approved.

III. Conclusion

SAFER asks that the City refrain from certifying the EIR or recommending approval of the Project in order to allow staff additional time to address the concerns raised herein. Please include this letter in the record of proceedings for this project. Thank you for your attention to these comments.

Sincerely,



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Indoor Air Quality in New California Homes with Mechanical Ventilation

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SUMMARY

The Healthy Efficient New Gas Homes (HENGH) study measured indoor air quality and mechanical ventilation use in 70 new California homes. This paper summarizes preliminary results collected from 42 homes. In addition to measurements of formaldehyde, nitrogen dioxide (NO₂), and PM_{2.5} that are discussed here, HENGH also monitored other indoor environmental parameters (e.g., CO₂) and indoor activities (e.g., cooking, fan use) using sensors and occupant logs. Each home was monitored for one week. Diagnostic tests were performed to characterize building envelope and duct leakage, and mechanical system airflow. Comparisons of indoor formaldehyde, NO₂, and PM_{2.5} with a prior California New Home Study (CNHS) (Offermann, 2009) suggest that contaminant levels are lower than measured from about 10 years ago. The role of mechanical ventilation on indoor contaminant levels will be evaluated.

KEYWORDS

Formaldehyde; nitrogen dioxide; particles; home performance; field study

1 INTRODUCTION

The HENGH field study (2016–2018) aimed to measure indoor air quality in 70 new California homes that have mechanical ventilation. Eligible houses were built in 2011 or later; had an operable whole-dwelling mechanical ventilation system; used natural gas for space heating, water heating, and/or cooking; and had no smoking in the home. Study participants were asked to rely on mechanical ventilation and avoid window use during the one-week monitoring period. All homes had a venting kitchen range hood or over the range microwave and bathroom exhaust fans. This paper presents summary results of formaldehyde, NO₂, and PM_{2.5} measurements in 42 homes. The full dataset is expected to be available in summer 2018.

2 METHODS

Integrated one-week concentrations of formaldehyde and NO_x were measured using SKC UMEx-100 and Ogawa passive samplers. Formaldehyde samplers were deployed in the main living space, master bedroom, and outdoors. PM_{2.5} were measured using a pair of photometers (ES-642/BT-645, MetOne Instruments) indoor in the main living space and outdoors. PM_{2.5} filter samples were collected using a co-located pDR-1500 (ThermoFisher) in a subset of the homes and time-resolved photometer data were adjusted using the gravimetric measurements. Results are compared with a prior field study CNHS (2007–2008) (Offermann, 2009) that monitored for contaminant concentrations over a 24-hour period in 108 homes built between 2002 and 2004, including a subset of 26 homes with whole-dwelling mechanical ventilation.

3 RESULTS

Figure 1 compares the indoor concentrations of formaldehyde, NO₂, and PM_{2.5} measured by the two studies. Results of HENGH are one-week averaged concentrations, whereas CHNS are 24-hour averages. HENGH measured lower indoor concentrations of formaldehyde and PM_{2.5}, compared to CNHS. For NO₂, the indoor concentrations measured by the two studies

are similar. Summary statistics of indoor and outdoor contaminant concentrations (mean and median concentrations; N=number of homes with available data) are presented in Table 1.

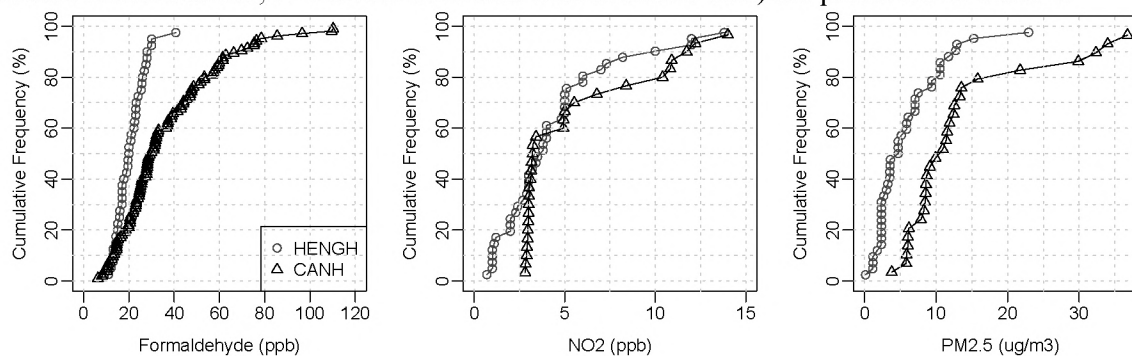


Figure 1. Comparisons of indoor contaminant concentrations measured by two studies.

Table 1. Summary statistics of indoor and outdoor contaminant concentrations.

	HENGH - Indoor			CNHS - Indoor			HENGH - Outdoor			CNHS - Outdoor		
	N	Median	Mean	N	Median	Mean	N	Median	Mean	N	Median	Mean
Formaldehyde (ppb)	39	20.0	20.6	104	29.5	36.3	38	2.0	2.0	43	1.8	2.8
NO ₂ (ppb)	40	3.7	4.4	29	3.2	5.4	40	3.0	3.1	11	3.1	3.5
PM _{2.5} (ug/m ³)	41	4.7	5.8	28	10.4	13.3	42	5.9	7.7	11	8.7	7.9

4 DISCUSSION

The lower formaldehyde concentrations measured by HENGH in comparison to CNHS may be attributable to California’s regulation to limit formaldehyde emissions from composite wood products that came into effect between the two studies. Gas cooking is a significant source of indoor NO₂ (Mullen et al., 2016). Even though NO₂ concentrations measured by HENGH are similar to levels found in CNHS, the two studies differed in that HENGH homes all use gas for cooking, whereas almost all homes (98%) from the prior study used electric ranges. More analysis is needed to determine the effectiveness of source control, such as range hood use during cooking, on indoor concentrations of cooking emissions such as NO₂ and PM_{2.5}. Lower PM_{2.5} indoors measured by HENGH compared to CNHS may be explained from a combination of lower outdoor PM_{2.5} levels, reduced particle penetration due to tighter building envelopes (Stephens and Siegel, 2012) combined with exhaust ventilation, and use of medium efficiency air filter (MERV 11 or better) in some HENGH homes. Further analysis of the data will evaluate the role of mechanical ventilation, including local exhaust and whole-dwelling ventilation system, on measured indoor contaminant levels.

5 CONCLUSIONS

New California homes now have lower indoor formaldehyde levels than previously measured, likely as a result of California’s formaldehyde emission standards. Indoor concentrations of NO₂ and PM_{2.5} measured are also low compared to a prior study of new homes in California.

ACKNOWLEDGEMENT

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6 REFERENCES

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