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October 29, 2025

Via Webform¹ and E-Mail

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**Re: SAFER Comment
AVA Pacific Beach Project
Project No. 1059329
Planning Commission Agenda Item 2 (Oct. 30, 2025)**

To the San Deigo Planning Commission and Project Manager Osborn:

This comment is submitted on behalf of Supporters Alliance For Environmental Responsibility ("SAFER") and its members living in and around the City of San Diego ("City") regarding the AVA Pacific Beach Project (Project No. 1059329) ("Project") and its Draft Environmental Impact Report dated March 2025 (SCH No. 2022120345) and Final Environmental Impact Report dated July 2025 (collectively "the EIR").

SAFER is concerned that the EIR fails to comply with the California Environmental Quality Act ("CEQA") due to: (1) the EIR's failure to adopt feasible mitigation measures to reduce the Project's significant and unavoidable transportation impacts; (2) the EIR's failure to adequately analyze and mitigate the increased cancer risks from emissions of diesel particulate matter during construction and operation of the Project; (3) the EIR's failure to accurately model and estimate the Project's construction emissions; (4) the EIR's failure to accurately disclose and mitigate the Project's ROG/VOC emissions; (5) the EIR's failure to ensure that the Project will

¹ <https://www.sandiego.gov/planning-commission/agenda-comment-form>

utilize clean construction equipment; and (6) the EIR's failure to adequately analyze and mitigate the increased cancer risks to future residents and employees from indoor emissions of formaldehyde.

SAFER's review of the Project and EIR was assisted by air quality experts Paul E. Rosenfeld, Ph.D, and Matt Hagemann, P.G., C.Hg. of Soil/Water/Air Protection Enterprise and indoor air quality expert Francis Offermann. CIH. Dr. Rosenfeld's comment and CV is attached hereto as **Exhibit A**. Mr. Offermann's comment and CV are attached hereto as **Exhibit B**.

SAFER respectfully requests that the Planning Commission refrain from recommending approval of the Project to the City Council until the EIR is revised to address SAFER's concerns as explained below.

PROJECT DESCRIPTION

The Project involves demolishing surface parking areas and a recreational sports deck and replacing it with three multi-family residential buildings (138-units total) and parking. Buildings would be two levels and three levels and would not exceed the Coastal Zone height limit of 30 feet. Parking would be provided as partially wrapped structures and minimal surface parking. The Project would provide a total of 634 parking spaces, where none are required. The parking spaces would be provided in garages (614 spaces) and surface parking (20 spaces).

The 12.96-acre Project site is located at 3823, 3863, 3913 Ingraham Street and 3952 Jewell Street. The Project site is bordered by Fortuna Avenue to the north, Jewell Street to the east, Ingraham Street to the west, and La Playa Avenue to the south. Surrounding the Project site to the west, east, and south are multi- and single-family residential and commercial uses. The Crown Point Junior Music Academy is located immediately north of the project site, with single- and multi-family residential uses located farther north beyond the school.

LEGAL STANDARD

CEQA requires that an agency analyze the potential environmental impacts of its proposed actions in an 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. Cal. 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 CCR § 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. (14 CCR § 15002(a)(2) and (3); see also *Berkeley Jets*, 91 Cal.App.4th at 1354; *Citizens of Goleta Valley*, 52 Cal.3d at 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.” (14 CCR § 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 CCR § 15092(b)(2)(A) and (B).)

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 at 1355 [quoting, *Laurel Heights Improvement Assn. v. Regents of University of California* (1988) 47 Cal. 3d 376, 391, 409, n. 12.]) “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.’” (*Berkeley Jets*, *supra*, 91 Cal.App.4th at 1355.)

An EIR must “include[] sufficient detail to enable those who did not participate in its preparation to understand and to consider meaningfully the issues the proposed project raises.” (*Sierra Club v. Cty. of Fresno* (2018) 6 Cal.5th 502, 510.) “Whether or not the alleged inadequacy is the complete omission of a required discussion or a patently inadequate one-paragraph discussion devoid of analysis, the reviewing court must decide whether the EIR serves its purpose as an informational document.” (*Id.* at 516.) “The determination whether a discussion is sufficient is not solely a matter of discerning whether there is substantial evidence to support the agency’s factual conclusions.” (*Id.*) As the Court emphasized:

[W]hether a description of an environmental impact is insufficient because it lacks analysis or omits the magnitude of the impact is not a substantial evidence question. A conclusory discussion of an environmental impact that an EIR deems significant can be determined by a court to be inadequate as an informational document without reference to substantial evidence.

(*Id.* at 514.)

In general, mitigation measures must be designed to minimize, reduce or avoid an identified environmental impact or to rectify or compensate for that impact. (14 CCR § 15370.) Where several mitigation measures are available to mitigate an impact, each should be discussed and the basis for selecting a particular measure should be identified. (14 CCR § 15126.4(a)(1)(B).) A lead agency may not make the required CEQA findings unless the administrative record clearly shows that all uncertainties regarding the mitigation of significant environmental impacts have been resolved.

DISCUSSION

I. The EIR Fails to Adopt All Feasible Mitigation Measures for the Project's Significant and Unavoidable Impacts.

CEQA prohibits a lead agency from approving a project with significant environmental effects if there are feasible mitigation measures or alternatives that can substantially lessen or avoid those effects. (Pub. Res. Code § 21002; *Mountain Lion Found. v. Fish & Game Comm'n* (1997) 16 Cal.4th 105, 134; *Laurel Heights*, 47 Cal.3d at 403 [“The chief goal of CEQA is mitigation or avoidance of environmental harm”].) CEQA defines “feasible” as “capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, social and technological factors.” (PRC §21061.1; 14 CCR § 15364.) “The core of an EIR is the mitigation and alternatives sections.” (*Citizens of Goleta Valley*, 52 Cal.3d at 564.) When an EIR concludes that a project will have significant impacts, the lead agency has two duties: to meaningfully consider feasible mitigation measures and alternatives, and to identify mitigation measures and alternatives rejected as infeasible. (See *Preservation Action Council v. City of San Jose* (2006) 141 Cal.App.4th 1336, 1353.)

The lead agency may not approve a project with significant impacts unless it makes one or more of three findings:

- (1) that changes or alternations have been required in, or incorporated into, the project that mitigate or avoid the significant effects on the environment;
- (2) that the agency making the findings lacks jurisdiction to make the change, but that another agency does have such authority, and either has made or can and should make, the change; and/or
- (3) that specific economic, legal, social, technological, or other considerations ... make infeasible the mitigation measures or project alternatives identified in the EIR.

(Pub. Res. Code §21081(a); 14 CCR §15091(a).)

When a comment suggests “better ways to avoid or mitigate the significant

environmental impacts” (14 CCR §§15088(c), 15204(a)), the lead agency must respond to the comment by either explaining why further consideration of the alternative or mitigation was rejected or by providing an evaluation of the alternative. (*Marin Mun. Water Dist. v. KG Land Cal. Corp.* (1991) 235 Cal.App.3d 1652, 1666; *Cal. Native Plant Soc’y v. City of Santa Cruz* (2009) 177 Cal.App.4th 957, 992 (CNPS).) “[A]n adequate EIR must respond to specific suggestions for mitigating a significant environmental impact unless the suggested mitigation is facially infeasible.” [citation omitted] ‘While the response need not be exhaustive, it should evince good faith and a reasoned analysis.’” (CNPS, 177 Cal.App.4th at 992 [citing *L.A. Unified School Dist. v. City of L.A.* (1997) 58 Cal.App.4th 1019, 1029; see also, *Citizens for Quality Growth v. City of Mount Shasta* (1988) 198 Cal.App.3d 433, 442, fn. 8.)

The EIR concludes that the Project would result in a significant and unavoidable transportation impact due to the Project’s residential vehicle miles traveled (“VMT”) exceeding the significance threshold for residential projects of 15 percent below the regional mean VMT per capita. (FEIR, p. 5.2-13.) The EIR requires a single mitigation measure to reduce this impact (TRANS-1, requiring only a resting area adjacent to a public walkway and an on-site bicycle repair station) but still concludes the impact will be significant and unavoidable. (FEIR, p. 5.2-13 to -14.)

Because the Project’s noise impact remains significant and unavoidable even with incorporation of MM TRANS-1, the City must require all feasible mitigation measures to reduce the noise impacts to the extent possible prior to proceeding with the Project. (Pub. Res. Code §21081(a); 14 CCR §15091(a).) However, the EIR fails to demonstrate that the City considered the feasibility of additional measures beyond MM TRANS-1.

There is ample opportunity for the City to expand the current on-site mitigation measures to reduce the Project’s VMTs. For example, the Project is providing electric vehicle (“EV”) charging stations at only 10 of the 634 new parking spaces (1.6%). (FEIR, p. 5.5-24.) An additional 9 of the 634 spaces (1.4%) will be “EV Capable” (which means electric infrastructure will be run to the spaces but no charger will be installed. (*Id.*)

As a preliminary matter, the EV spaces provided by the Project fall well below the state’s CalGreen requirements. The most recent 2024 updates to the CalGreen code require **forty percent** (40%) of the Project’s total spaces to be equipped with EV charging stations. (CalGreen § 4.106.4.2.2.b.) Under the older 2022 CalGreen Code, twenty-five percent (25%) of the total spaces need to have EV chargers and an additional ten percent (10%) need to be EV Capable. The Project, with 1.6% EV chargers and 1.4% EV Capable, comes nowhere close to meeting either standard.

There is no discussion in the EIR about the feasibility of increasing the required amount of EV charging stations or EV capable spaces to further reduce the significant and avoidable VMT impact. At the very least, the City needs to require the bare minimum required by code. However, the City must also consider the feasibility of going beyond the bare minimum required

by code, such as adopting CalGreen's Tier 1 and Tier 2 voluntary measures, which demonstrate the potential feasibility of requiring more EV spaces. (CalGreen §§ A5.106.5.3.1, A5.106.5.3.2.)

The City cannot certify the EIR until it demonstrates that it has applied all feasible mitigation measures for the Project's significant and unavoidable VMT impact. The EIR must be revised to incorporate additional feasible mitigation measures or otherwise explain why additional measures are infeasible.

II. The EIR fails to adequately analyze and mitigate the increased cancer risk from the Project's emissions of diesel particulate matter.

Paul E. Rosenfeld, Ph.D. of the Soil/Water/Air Protection Enterprise reviewed the EIR's air quality analysis. Dr. Rosenfeld's comment letter and CV are attached as **Exhibit A**. Dr. Rosenfeld found that the EIR failed to adequately analyze and mitigate the human health impacts resulting from the Project's emissions of diesel particulate matter ("DPM"), a known toxic air contaminant ("TAC") and human carcinogen.

The EIR concludes that the Project's impacts from DPM will be less than significant without conducting a quantified construction health risk assessment ("HRA"). As noted by Dr. Rosenfeld, agencies must make a "reasonable effort to substantively connect a project's air quality impacts to likely health consequences." (Ex. A, p. 8.) Such an analysis is not possible without a quantified HRA. A quantified HRA for construction of the Project is necessary to ensure that the Project's health risks are disclosed and compared to the Air District's significance threshold for increased cancer risk. (*Id.*)

Dr. Rosenfeld prepared a screening-level HRA to evaluate potential impacts to human health from DPM during construction of the Project using AERSCREEN, the leading screening-level air quality dispersion model. (Ex. A, pp. 8-10.) According to the EIR's air quality modeling data, construction of the Project will generate 328.7 pounds of DPM over the 1250-day construction period. (*Id.*, p. 9.) Using those values, Dr. Rosenfeld conducted an HRA to calculate the increased cancer risk resulting from those DPM emissions to the maximally exposed individual receptor located approximately 100 meters downwind of the Project site. (*Id.*) Dr. Rosenfeld's HRA utilized age sensitivity factors in order to account for the increased sensitivity to carcinogens during early-in-life exposure and to assess the risk for susceptible subpopulations such as children. (*Id.*, p. 10.)

Dr. Rosenfeld's HRA found that increased cancer risk to infants during construction of the Project would be 74.9 in one million. (Ex. A, p. 11.) Additionally, the increased cancer risk for a 30-year residential lifetime would be 84.9 in one million. (*Id.*) These cancer risks exceed SDAPCD's CEQA significance threshold of 10 in one million.

By failing to conduct a construction HRA, the EIR fails to provide substantial evidence that the Project's health impacts from DPM emissions would be less than significant. Dr. Rosenfeld's analysis provides concrete evidence that the City should further investigate the air

quality impacts from construction of the Project. The EIR must be amended and recirculated in order to disclose this impact and mitigate it to the extent feasible.

III. The EIR fails to adequately analyze the Project's emissions of criteria pollutants.

The EIR relies the California Emissions Estimator Model Version ("CalEEMod") to estimate the Project's emissions of criteria pollutants. CalEEMod relies on recommended default values based on site specific information but allows the user to override the default values if more specific information about a project is known. Dr. Rosenfeld reviewed the Project's available CalEEMod output files from the EIR and found that the values input into the model were inconsistent with information provided in the EIR, resulting in an underestimation of the Project's emissions. (Ex. 1, p. 3.)

Specifically, Dr. Rosenfeld found that the following values used in the EIR's air quality analysis were either inconsistent with information provided in the EIR or otherwise unjustified:

1. Unsubstantiated changes to land use size (Ex. A, pp. 2-3.)
2. Unsubstantiated changes to construction schedule (Ex. A, pp. 3-5.)
3. Underestimated amount of required demolition (Ex. A, p. 5.)
4. Unsupported application of Tier 4 Final emissions standards (Ex. A, pp. 5-6.)

Due to the unjustified edits to CalEEMod's default values, the EIR's air quality analysis underestimates the Project's emissions and fails to provide substantial evidence that those impacts will be less than significant. The EIR must be revised adequately evaluate the impacts that construction and operation of the Project will have on local and regional air quality.

IV. The EIR fails to adequately disclose and mitigate the Project's significant ROG/VOC emissions.

In an effort to accurately determine the Project's emissions, Dr. Rosenfeld prepared an updated CalEEMod that (1) excluded the unsupported changes to the construction phase lengths; (2) excluded the unsupported application of Tier 4 Final emissions standards; and (3) included the correct amount of demolition. (Ex. A, p. 7.)

Dr. Rosenfeld's updated analysis found that the Project's construction-related ROG/VOC emissions would reach 219 pounds per day, well in excess of SDAPCD's 137 pounds per day significance threshold. (Ex. A, p. 8.) Dr. Rosenfeld's updated analysis also found that the Project's construction-related NOx emissions of 264 pounds per day would exceed the 100 pounds per day significance threshold set by SCAQMD. (Ex. 1, p. 8.)

Dr. Rosenfeld has provided feasible mitigation measures that could be applied to reduce the Project's emissions. (Ex. A, pp. 12-24.) The Planning Commission should ensure that the Project's emissions are mitigated to the extent feasible. The EIR must be revised and recirculated to disclose the Project's significant ROG/VOC emissions and to include feasible mitigation

measures for those emissions.

V. The EIR Fails to Ensure the Use of Clean Construction Equipment.

In the EIR's analysis of whether the Project would expose sensitive receptors to substantial pollutant concentrations, the EIR claims, "Construction equipment would consist of Tier 4 Final equipment (the most recent engine emissions standard implemented by the Federal EPA), which would further reduce the potential for impact of construction DPM emissions on sensitive receptors." (FEIR, p. 5.4-22.) This claim is entirely unsubstantiated because nothing in the EIR's mitigation measures or the EIR's discussion of the Project's design features requires the use of Tier 4 Final equipment. By assuming that the Project will utilize Tier 4 Final equipment without actually requiring it, the EIR fails to accurately describe the Project and underestimates the Project's impacts. The EIR must be revised to include Tier 4 Final as a binding mitigation measure or otherwise be revised to remove references to Tier 4 Final in the EIR and the EIR's air quality modeling.

VI. The EIR Fails to Disclose and Mitigate the Project's Significant Indoor Air Quality Impacts.

The EIR fails to discuss, disclose, analyze, and mitigate the significant health risks posed by the Project from formaldehyde, a toxic air contaminant ("TAC"). Certified Industrial Hygienist, Francis Offermann, PE, CIH, has conducted a review of the Project, attached as **Exhibit B**. Mr. Offermann is one of the world's leading experts on indoor air quality, in particular emissions of formaldehyde, and has published extensively on the topic. As discussed below and set forth in Mr. Offermann's comments, the Project's emissions of formaldehyde will result in significant cancer risks to the Project's future residents. Mr. Offermann's expert opinion demonstrates the Project's significant health risk impacts, which the City has a duty to investigate, disclose, and mitigate in a recirculated EIR.

Formaldehyde is a known human carcinogen and listed by the State of California as a TAC. SDAPCD has established a significance threshold for health risks from carcinogenic TACs of 10 in a million (Ex. B, p. 2.). The EIR fails to acknowledge the significant indoor air emissions that will result from the Project. Specifically, there is no discussion of impacts or health risks, no analysis, and no identification of mitigations for the Project's significant emissions of formaldehyde Project.

Mr. Offermann explains that many composite wood products typically used in home and apartment building construction contain formaldehyde-based glues which off-gas formaldehyde. He states, "The primary source of 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, office, and retail building construction for flooring, cabinetry, baseboards, window shades, interior doors, and window and door trims." (Ex. B, pp. 2-3.)

Mr. Offermann found that future residents of the Project's residential units will be exposed to a cancer risk from formaldehyde of approximately 120 per million, *even assuming that* all materials are compliant with the California Air Resources Board's formaldehyde airborne toxics control measure. (Ex. B, p. 3.) This is more than 12 times SDAPCD's CEQA significance threshold of 10 per million. (*Id.*)

Mr. Offermann concludes that these significant environmental impacts must be analyzed in an EIR and mitigation measures should be imposed to reduce the risk of formaldehyde exposure. (Ex. B, pp. 5, 11-13.) He prescribes a methodology for estimating the Project's formaldehyde emissions in order to do a more project-specific health risk assessment. (Ex. B, pp. 5-9). Mr. Offermann also suggests several feasible mitigation measures, such as requiring the use of no-added-formaldehyde composite wood products, which are readily available. (Ex. B pp. 11-13.) Mr. Offermann also suggests requiring air ventilation systems which would reduce formaldehyde levels. (Ex. B, p. 12.) Since the EIR does not analyze this impact at all, none of these or other mitigation measures have been considered.

When a Project exceeds a duly adopted CEQA significance threshold, as here, this alone establishes substantial evidence that the project will have a significant adverse environmental impact. 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 Air District'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 Since expert evidence demonstrates that the Project will exceed the SCAQMD's CEQA significance threshold, there is substantial evidence that an "unstudied, **potentially significant environmental effect**]" exists. (See *Friends of Coll. of San Mateo Gardens v. San Mateo Cty. Cmty. Coll. Dist.* (2016) 1 Cal.5th 937, 958 [emphasis added].)

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 holds 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 800-01.) 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 identified by Mr. Offermann are not an existing environmental condition. Those emissions to the air will be from the Project. People will be residing in the Project’s buildings once built and emitting formaldehyde. Once built, the Project will begin to emit formaldehyde at levels that pose significant direct and cumulative 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 existing TAC sources near the Project site would have to be considered in evaluating the cumulative effect on future residents of both the Project’s TAC emissions as well as those existing off-site emissions.

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.) 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., PRC §§ 21000, 21001].) It goes without saying that the future residents of the Project are human beings and their health and safety must be subject to CEQA’s safeguards.

The City has a duty to investigate issues relating to a project’s potential environmental impacts. (*See County Sanitation Dist. No. 2 v. County of Kern*, (2005) 127 Cal.App.4th 1544, 1597–98. [“[U]nder CEQA, the lead agency bears a burden to investigate potential environmental impacts.”].) The proposed buildings will have significant impacts on air quality and health risks by emitting cancer-causing levels of formaldehyde into the air that will expose future residents to cancer risks potentially in excess of SDAPCD’s significance threshold for cancer health risks of 10 in a million. Currently, outside of Mr. Offermann’s comments, the City does not have any idea what risks will be posed by formaldehyde emissions from the Project. As a result, the City must include an analysis and discussion in an updated EIR which discloses and analyzes the health risks that the Project’s formaldehyde emissions may have on future residents and identifies appropriate mitigation measures.

CONCLUSION

The EIR fails to comply with the requirements of CEQA due to: (1) the EIR’s failure to

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adopt feasible mitigation measures to reduce the Project's significant and unavoidable transportation impacts; (2) the EIR's failure to adequately analyze and mitigate the increased cancer risks from emissions of diesel particulate matter during construction and operation of the Project; (3) the EIR's failure to accurately model and estimate the Project's construction emissions; (4) the EIR's failure to accurately disclose and mitigate the Project's ROG/VOC emissions; (5) the EIR's failure to ensure that the Project will utilize clean construction equipment; and (6) the EIR's failure to adequately analyze and mitigate the increased cancer risks to future residents and employees from indoor emissions of formaldehyde.

SAFER respectfully requests that the Planning Commission refrain from recommending approval of the Project and EIR to the City Council until the EIR is revised to remedy the shortcomings raised in this comment.

Sincerely,



Brian B. Flynn
Lozeau Drury LLP

EXHIBIT A



Technical Consultation, Data Analysis and
Litigation Support for the Environment

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August 29, 2025

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Subject: Comments on the AVA Pacific Beach Project (SCH No. 2022120345)

Dear Mr. Flynn,

We have reviewed the July 2025 Final Environmental Impact Report ("FEIR") for the AVA Pacific Beach Project ("Project") located in the City of San Diego ("City"). The Project proposes to demolish the existing surface parking areas and a recreational sports deck and construct 138 multi-family dwelling units in three buildings as well as 634 parking spaces.

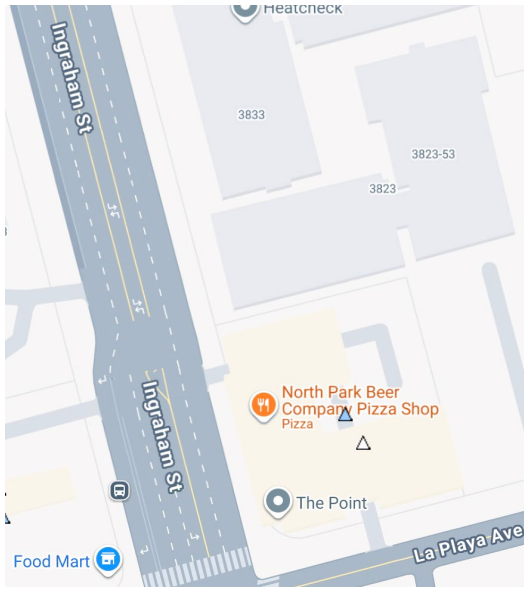
Our review concludes that the FEIR fails to adequately evaluate the Project's hazards, hazardous materials, air quality, and health risk impacts. As a result, emissions and health risk impacts associated with construction and operation of the proposed Project may be underestimated and inadequately addressed. A revised EIR should be prepared to adequately assess and mitigate the potential hazards, hazardous materials, air quality, and health risk impacts that the Project may have on the environment.

Hazards and Hazardous Materials

Inadequate Disclosure and Analysis of Impacts

A Phase I Environmental Site Assessment was not prepared for the Project and no hazards and hazardous waste analysis was included in the FEIR – only an Envirostor search was conducted (and included as Appendix M to the FEIR). To provide for adequate disclosure and any necessary mitigation, a Phase I is necessary along with a full hazards and hazardous waste analysis in a revised EIR, especially because two closed underground storage tank sites are within Project boundaries.

Envirostor shows the following two sites within the Project boundaries.



[CROWN POINT UNOCAL 26 #256251 \(T0607300678\)](#)

3805 INGRAHAM ST
SAN DIEGO, CA 921096433

[3805 INGRAHAM STREET \(T10000003569\)](#)

3805 INGRAHAM STREET
SAN DIEGO, CA 92109

Although these sites have been closed by the Regional Water Quality Control Board, a review of potential hazards is necessary for adequate disclosure. A revised EIR is necessary to include a review of the potential hazards these sites may pose to future residents of the Project.

Air Quality

Unsubstantiated Input Parameters Used to Estimate Project Emissions

When reviewing the Project's CalEEMod output files, provided in the Air Quality Technical Report ("AQ Report") provided as Appendix E to the FEIR, we identified several model inputs related to Project construction and operation that are inconsistent with information disclosed in the FEIR. The impacts of these changes are quantified in the section of this letter titled "Updated Analysis Indicates a Potentially Significant Air Quality Impact." A revised EIR should be prepared to include an updated air quality analysis that provides a more detailed evaluation of the impact that construction and operation of the Project may have on local and regional air quality.

Changes to Land Use Size

Review of the CalEEMod output files demonstrates that the "AVA Pacific Beach Custom Report" model includes 344,437-SF of "Apartments Mid Rise" space (see screenshot below) (Appendix E, pp. 54).

Land Use Subtype	Size	Unit	Lot Acreage	Building Area (sq ft)	Landscape Area (sq ft)	Special Landscape Area (sq ft)	Population	Description
Apartments Mid Rise	138	Dwelling Unit	0.90	344,437	34,006	—	385	—
Enclosed Parking with Elevator	614	Space	1.49	245,600	0.00	—	—	—
Parking Lot	20.0	Space	0.18	0.00	0.00	—	—	—

The residential square footage included in the model is unsubstantiated, as the FEIR fails to mention or specify the square footage of the proposed building area whatsoever. The FEIR states:

“The project involves demolishing surface parking areas and a recreational sports deck. These areas would be redeveloped as multi-family dwelling units in three buildings (Buildings 1, 2, and 3) consisting of 138 units, including seven affordable housing units. Residential units for the project would be provided in one-bedroom and two-bedroom configurations. All units would have private outdoor space in balconies or patios. Buildings would be two levels and three levels and would not exceed the Coastal Zone height limit of 30 feet” (p. ES-2).

As indicated above, the FEIR does not include the projected square footage of the three proposed apartment buildings. The square footage included in the model is thus unsupported and may be underestimated.

This potential underestimation presents an issue, as the land use size feature is used throughout CalEEMod to determine default variable and emission factors that affect the model’s calculations. The square footage of each land use is used for certain calculations such as architectural coatings and energy use.¹ By potentially underestimating the size of the proposed single-family housing, the model may underestimate the Project’s construction and operational emissions and should not be relied upon to determine Project significance.

Unsubstantiated Changes to Construction Schedule

Review of the CalEEMod output files demonstrates that the “AVA Pacific Beach Custom Report” model alters the default construction phase lengths and includes the following construction schedule (see excerpt below) (Appendix E, pp. 108).

Phase Name	Phase Type	Start Date	End Date	Days Per Week	Work Days per Phase
Demolition	Demolition	6/3/2024	9/2/2024	5.00	66.0
Site Preparation	Site Preparation	9/3/2024	12/2/2024	5.00	65.0
Grading	Grading	12/3/2024	4/2/2025	5.00	87.0
Building Construction	Building Construction	4/3/2025	9/2/2027	5.00	631
Paving	Paving	9/3/2027	9/23/2027	5.00	15.0
Architectural Coating	Architectural Coating	9/24/2027	11/5/2027	5.00	31.0

¹ “CalEEMod User Guide.” CAPCOA, April 2022, available at: https://www.caleemod.com/documents/user-guide/01_User%20Guide.pdf, p. 30.

The CalEEMod User's Guide requires any changes to model defaults be justified.² The justification provided for these changes is:

“Construction schedule provided by client; assumed all development occurring in one phase. Site preparation not listed separately; split demo and remediation into 3 months each” (Appendix E, pp. 126).

Regarding the construction schedule, the AQ Report states that “Table 5 shows the construction schedule assumed for each of the construction phases at the site” and includes the following table (see excerpt below) (p. 24, Table 5).

TABLE 5 CONSTRUCTION SCHEDULE – AVA PACIFIC BEACH DEVELOPMENT	
Construction Phase	Estimated Dates
Demolition	June 3, 2024 – September 2, 2024
Site Preparation	September 3, 2024 – December 2, 2024
Grading	December 3, 2024 – April 2, 2025
Building Construction	April 3, 2025 – September 2, 2027
Paving	September 3, 2027 – September 23, 2027
Architectural Coating	September 24, 2027 – November 5, 2027

However, Table 5 and the construction schedule included in the model remain unsupported for three reasons.

First, the FEIR does not discuss the Project's anticipated construction schedule whatsoever. Second, the AQ Report indicates that Table 5 presents the *assumed* construction schedule included in the model and, thus, reflects the modeling parameters, not the actual construction schedule anticipated on the site. Third, while the justification provided by the “User Changes to Default Data” table states that the schedule is provided by the client, this is not substantiated anywhere in the Project documents. According to the CalEEMod User's Guide:

“CalEEMod was also designed to allow the user to change the defaults to reflect site- or project-specific information, when available, provided that the information is supported by substantial evidence as required by CEQA.”³

As the FEIR and associated documents do not provide substantial evidence to support the revised construction schedule, we cannot verify the changes.

² “CalEEMod User Guide.” CAPCOA, April 2022, available at: https://www.caleemod.com/documents/user-guide/01_User%20Guide.pdf, p. 13, 14.

³ “CalEEMod User Guide.” CAPCOA, April 2022, available at: https://www.caleemod.com/documents/user-guide/01_User%20Guide.pdf, p. 10.

Without a verifiable source, the construction schedule included in the model—and consequently construction-related emissions—may be spread out over a longer period. By potentially extending the total construction duration, the model assumes a greater number of days to complete the construction activities required by each individual phase. There will be fewer construction activities required per day and, consequently, less pollutants emitted per day. The model may underestimate the peak daily emissions associated with construction and should not be relied upon to determine Project significance.

Underestimated Amount of Required Demolition

Regarding the amount of demolition required for Project construction, the FEIR states:

“The project proposes demolition of underutilized areas of the project site totaling approximately 149,682 square feet. Approximately 10,578 tons of waste are expected to be generated during demolition” (p. 5.12-14).

As indicated above, the Project would generate 10,578 tons of demolition waste. Review of the CalEEMod output files demonstrates that the “AVA Pacific Beach Custom Report” model only includes 3,805 tons of demolition debris (Appendix E, pp. 113).

Phase Name	Material Imported (cy)	Material Exported (cy)	Acres Graded (acres)	Material Demolished (Ton of Debris)
Demolition	0.00	0.00	0.00	3,805
Site Preparation	—	—	97.5	0.00
Grading	1,087	—	87.0	0.00
Paving	0.00	0.00	0.00	0.00

The model thus underestimates the amount of demolition generated by Project construction by 6,773 tons.⁴

This underestimation presents an issue, as demolition material is used to calculate emissions associated with fugitive dust, debris removal, as well as exhaust from hauling trucks traveling to and from the Project site.⁵ By failing to include the full amount of required demolition, the model underestimates the Project’s construction-related emissions and should not be relied upon to determine Project significance.

Unsupported Application of Tier 4 Final Emissions Standards

The “AVA Pacific Beach Custom Report” model includes changes to the off-road construction equipment input parameters and assumes that the Project’s off-road equipment fleet would meet Tier 4 Final emissions standards (see screenshot below) (Appendix E, pp. 109, 110).

⁴ Calculated: 10,578 tons required demolition – 3,805 tons modeled demolition = 6,773 tons underestimated demolition.

⁵ “CalEEMod User Guide.” CAPCOA, April 2022, available at: https://www.caleemod.com/documents/user-guide/01_User%20Guide.pdf, p. 38.

Phase Name	Equipment Type	Fuel Type	Engine Tier	Number per Day	Hours Per Day	Horsepower	Load Factor
Demolition	Concrete/Industrial Saws	Diesel	Tier 4 Final	1.00	8.00	33.0	0.73
Demolition	Rubber Tired Dozers	Diesel	Tier 4 Final	1.00	8.00	367	0.40
Demolition	Tractors/Loaders/Backhoes	Diesel	Tier 4 Final	3.00	8.00	84.0	0.37
Site Preparation	Graders	Diesel	Tier 4 Final	1.00	8.00	148	0.41
Site Preparation	Scrapers	Diesel	Tier 4 Final	1.00	8.00	423	0.48
Site Preparation	Tractors/Loaders/Backhoes	Diesel	Tier 4 Final	1.00	7.00	84.0	0.37
Grading	Graders	Diesel	Tier 4 Final	1.00	8.00	148	0.41
Grading	Rubber Tired Dozers	Diesel	Tier 4 Final	1.00	8.00	367	0.40
Grading	Tractors/Loaders/Backhoes	Diesel	Tier 4 Final	2.00	7.00	84.0	0.37
Building Construction	Cranes	Diesel	Tier 4 Final	1.00	8.00	367	0.29
Building Construction	Forklifts	Diesel	Tier 4 Final	2.00	7.00	82.0	0.20
Building Construction	Generator Sets	Diesel	Average	1.00	8.00	14.0	0.74

Building Construction	Tractors/Loaders/Backhoes	Diesel	Tier 4 Final	1.00	6.00	84.0	0.37
Building Construction	Welders	Diesel	Tier 4 Final	3.00	8.00	46.0	0.45
Paving	Cement and Mortar Mixers	Diesel	Average	1.00	8.00	10.0	0.56
Paving	Pavers	Diesel	Tier 4 Final	1.00	8.00	81.0	0.42
Paving	Paving Equipment	Diesel	Tier 4 Final	1.00	8.00	89.0	0.36
Paving	Rollers	Diesel	Tier 4 Final	2.00	8.00	36.0	0.38
Paving	Tractors/Loaders/Backhoes	Diesel	Tier 4 Final	1.00	8.00	84.0	0.37
Architectural Coating	Air Compressors	Diesel	Tier 4 Final	1.00	6.00	37.0	0.48

The CalEEMod User's Guide requires any changes to model defaults be justified.⁶ The justification provided for these changes is:

"No equipment specified by client; CalEEMod default equipment mix. Client states all equipment will be Tier 4 w/ DEF" (Appendix E, pp. 126).

Additionally, the FEIR states that:

"Construction equipment would consist of Tier 4 Final equipment (the most recent engine emissions standard implemented by the Federal EPA), which would further reduce the potential for impact of construction DPM emissions on sensitive receptors" (p. 5.4-22).

The inclusion of more stringent emissions standards remains unsupported as the FEIR does not explicitly require Tier 4 Interim emissions standards through a formal mitigation measure. According to the Association of Environmental Professionals ("AEP") *CEQA Portal Topic Paper* on mitigation measures:

"While not 'mitigation', a good practice is to include those project design feature(s) that address environmental impacts in the mitigation monitoring and reporting program (MMRP). Often the MMRP is all that accompanies building and construction plans through the permit process. If the design features are not listed as important to addressing an environmental impact, it is easy for someone not involved in the original environmental process to approve a change to the project

⁶ "CalEEMod User Guide." CAPCOA, April 2022, available at: https://www.caleemod.com/documents/user-guide/01_User%20Guide.pdf, p. 13, 14.

that could eliminate one or more of the design features without understanding the resulting environmental impact.”⁷

As the inclusion of Tier 4 Final emissions standards on the Project site is not formally included as a mitigation measure, we cannot guarantee that it would be implemented, monitored, and enforced on the Project site. By including Tier 4 Final emissions standards without properly committing to its implementation, the model may underestimate the Project’s operational emissions and should not be relied upon to determine Project significance.

Incorrect Application of Construction Mitigation Measure

The “AVA Pacific Beach Custom Report” model includes the following construction mitigation measure (see screenshot below) (Appendix E, pp. 54).

1.3. User-Selected Emission Reduction Measures by Emissions Sector

Sector	#	Measure Title
Construction	C-5	Use Advanced Engine Tiers
Transportation	T-1	Increase Residential Density
Transportation	T-14*	Provide Electric Vehicle Charging Infrastructure
Transportation	T-34*	Provide Bike Parking

As previously stated, the FEIR does not explicitly require advanced engine tiers through a formal mitigation measure. As a result, the inclusion of the above-mentioned construction mitigation measure in the model is unsupported. We recommend a revised EIR be prepared so that the use of Tier 4 Final emissions standards for construction equipment engines is formally identified as a mitigation measure within a MMRP, consistent with guidance from the Association of Environmental Professionals (“AEP”) and CEQA requirements for enforceable mitigation.⁸

Updated Analysis Indicates a Potentially Significant Air Quality Impact

To more accurately estimate the Project’s construction-related emissions, we prepared a CalEEMod model, using the Project-specific information provided by the FEIR. We excluded the unsupported changes to the construction phase lengths and Tier 4 Final emissions standard and included the correct amount of demolition. All other inputs remain consistent with the FEIR’s model.

Our updated analysis estimates that the Project’s construction-related reactive organic gases/volatile organic compounds (“ROG/VOC”) emissions exceed the applicable threshold of 137 pounds per day (“lbs/day”) (see table below).

⁷ “CEQA Portal Topic Paper Mitigation Measures.” AEP, February 2020, *available at*: <https://ceqaportal.org/tp/CEQA%20Mitigation%202020.pdf>, p. 6.

⁸ “CEQA Portal Topic Paper Mitigation Measures.” AEP, February 2020, *available at*: <https://ceqaportal.org/tp/CEQA%20Mitigation%202020.pdf>, p. 6.

SWAPE Criteria Air Pollutant Emissions Estimates	
Construction	ROG/VOC (lbs/day)
FEIR	70.6
SWAPE	219
SDAPCD Threshold	137
Exceeds?	Yes

According to our analysis, the construction-related ROG/VOC emissions are estimated to be approximately 219 lbs/day, exceeding the San Diego Air Pollution Control District’s (“SDAPCD”) recommended significance threshold. This finding indicates a potentially significant air quality impact that the FEIR did not identify or address. In our opinion, a revised EIR should be conducted to provide a more substantial evaluation of the potential air quality impacts from the Project on the environment.

Diesel Particulate Matter Emissions Inadequately Evaluated

The FEIR concludes that the Project would have a less-than-significant health risk impact without conducting a quantified construction health risk analysis (“HRA”) (p. 5.4-22). The FEIR is thus inconsistent with CEQA’s requirement to correlate the increase in emissions generated by the Project to the adverse impacts on human health caused by those emissions. Under CEQA, agencies must make a “reasonable effort to substantively connect a project’s air quality impacts to likely health consequences.”⁹ To comply with this requirement, a construction-phase HRA should have been performed to assess the potential health risks to nearby sensitive receptors from diesel particulate matter (“DPM”) emissions generated during construction. The resulting cancer risk estimate should then be compared against the SDAPCD established threshold of 10 in one million.¹⁰

Screening-Level Analysis Demonstrates Potentially Significant Health Risk Impact

We conducted a screening-level risk assessment using AERSCREEN, a screening-level air quality dispersion model which uses a limited amount of site-specific information to generate maximum reasonable downwind concentrations of air contaminants to which nearby sensitive receptors may be exposed.¹¹ We prepared a preliminary HRA of the Project’s construction-related health risk impact to residential sensitive receptors using the annual, unmitigated PM₁₀ exhaust estimates from the FEIR’s CalEEMod output files. Consistent with recommendations set forth by the Office of Environmental

⁹ “Sierra Club v. County of Fresno.” Supreme Court of California, December 2018, *available at*: <https://law.justia.com/cases/california/supreme-court/2018/s219783a.html>

¹⁰ “Toxic Air Contaminant Health Risks – Public Notification And Risk Reduction.” SDAPCD, February 2025, *available at*: <https://www.sdapcd.org/content/dam/sdapcd/documents/rules/current-rules/Rule-1210.pdf>, p. 3.

¹¹ “Air Quality Dispersion Modeling - Screening Models,” U.S. EPA, *available at*: <https://www.epa.gov/scram/air-quality-dispersion-modeling-screening-models>.

Health Hazard Assessment (“OEHHA”), we assumed residential exposure begins during the third trimester stage of life.¹²

The “AVA Pacific Beach Custom Report” model indicates that construction activities will generate approximately 328.7 pounds of DPM over the 1250-day construction period.¹³ The AERSCREEN model relies on a continuous average emission rate to simulate maximum downward concentrations from point, area, and volume emission sources. To account for the variability in equipment usage and truck trips over construction of the Project, we calculated an average DPM emission rate by the following equation:

$$\text{Emission Rate} \left(\frac{\text{grams}}{\text{second}} \right) = \frac{328.7 \text{ lbs}}{1250 \text{ days}} \times \frac{453.6 \text{ grams}}{\text{lbs}} \times \frac{1 \text{ day}}{24 \text{ hours}} \times \frac{1 \text{ hour}}{3,600 \text{ seconds}} = \mathbf{0.00138 \text{ g/s}}$$

Using this equation, we estimated a construction emission rate of 0.00138 grams per second (“g/s”).

Construction was simulated as a 1.5-acre rectangular area source in AERSCREEN, with an initial vertical dimension of 1.5 meters and a maximum horizontal dimension of 187.6 meters. The minimum horizontal dimension is about 93.8 meters. A release height of three meters was selected to represent the height of stacks of operational equipment and other heavy-duty vehicles, and an initial vertical dimension of one and a half meters was used to simulate instantaneous plume dispersion upon release. An urban meteorological setting was selected with model-default inputs for wind speed and direction distribution. The population of San Diego was obtained from U.S. 2024 Census data.¹⁴

The AERSCREEN model generates maximum reasonable estimates of single-hour DPM concentrations for the Project. The U.S. Environmental Protection Agency (“U.S. EPA”) suggests that the annualized average concentration of an air pollutant be estimated by multiplying the single-hour concentration by 10% in screening procedures.¹⁵ The FEIR states that the closest known sensitive receptors are the “residents of multi-family and single-family residences located within and adjacent to the project site, and the Crown Point Junior Music Academy north of the project site”(p. 5.4-22). However, review of the AERSCREEN output files demonstrate that the *maximally* exposed individual receptor (“MEIR”) is located approximately 100 meters downwind of the Project site.¹⁶ Thus, the single-hour concentration estimated by AERSCREEN for construction of the Project is therefore approximately 2.28 µg/m³ DPM at approximately 100 meters downwind. Multiplying this single-hour concentration by 10%, we get an annualized average concentration of 0.228 µg/m³ for Project construction.

¹² “Risk Assessment Guidelines: Guidance Manual for Preparation of Health Risk Assessments.” OEHHA, February 2015, available at: <https://oehha.ca.gov/media/downloads/cnr/2015guidancemanual.pdf>, p. 8-18.

¹³ See Attachment B for health risk calculations.

¹⁴ “San Diego.” U.S. Census Bureau, 2024, available at: <https://datacommons.org/place/geoid/0666000>.

¹⁵ “Screening Procedures for Estimating the Air Quality Impact of Stationary Sources Revised.” U.S. EPA, October 1992, available at: https://www.epa.gov/sites/default/files/2020-09/documents/epa-454r-92-019_ocr.pdf.

¹⁶ See Attachment D for AERSCREEN output files.

Guidance from OEHHA and the California Air Resources Board (“CARB”) recommends the use of a standard point estimate approach, including high-point estimate (i.e. 95th percentile) breathing rates and age sensitivity factors to account for the increased sensitivity to carcinogens during early-in-life exposure and accurately assess risk for susceptible subpopulations such as children. The residential exposure parameters used for the various age groups in our screening-level HRA are as follows:

Exposure Assumptions for Residential Individual Cancer Risk						
Age Group	Breathing Rate (L/kg-day) ¹⁷	Age Sensitivity Factor ¹⁸	Exposure Duration (years)	Fraction of Time at Home ¹⁹	Exposure Frequency (days/year) ²⁰	Exposure Time (hours/day)
3 rd Trimester	361	10	0.25	1	350	24
Infant (0 – 2)	1090	10	2	1	350	24
Child (2 – 16)	572	3	14	1	350	24
Adult (16 – 30)	261	1	14	0.73	350	24

For the inhalation pathway, the procedure requires the incorporation of several discrete variates to effectively quantify doses for each age group. Once determined, contaminant dose is multiplied by the cancer potency factor in units of inverse dose expressed in milligrams per kilogram per day (mg/kg/day⁻¹) to derive the cancer risk estimate. We used the following dose algorithm, therefore, to assess exposures:

$$Dose_{AIR, per\ age\ group} = C_{air} \times EF \times \left[\frac{BR}{BW} \right] \times A \times CF$$

where:

Dose_{AIR} = dose by inhalation (mg/kg/day), per age group
C_{air} = concentration of contaminant in air (µg/m³)
EF = exposure frequency (number of days/365 days)
BR/BW = daily breathing rate normalized to body weight (L/kg/day)
A = inhalation absorption factor (default = 1)
CF = conversion factor (1x10⁻⁶, µg to mg, L to m³)

We then used the following equation for each appropriate age group to calculate the overall cancer risk:

¹⁷ “Risk Assessment Guidelines Guidance Manual for Preparation of Health Risk Assessments.” OEHHA, February 2015, available at: <https://oehha.ca.gov/media/downloads/crn/2015guidancemanual.pdf>.

¹⁸ *Ibid.*, p. 8-5 Table 8.3.

¹⁹ *Ibid.*, p. 8-5, Table 8.4.

²⁰ *Ibid.*, p. 5-24.

$$Cancer\ Risk_{AIR} = Dose_{AIR} \times CPF \times ASF \times FAH \times \frac{ED}{AT}$$

where:

Dose_{AIR} = dose by inhalation (mg/kg/day), per age group

CPF = cancer potency factor, chemical-specific (mg/kg/day)⁻¹

ASF = age sensitivity factor, per age group

FAH = fraction of time at home, per age group (for residential receptors only)

ED = exposure duration (years)

AT = averaging time period over which exposure duration is averaged (always 70 years)

Consistent with the 1,250-day construction schedule, the annualized average concentration for construction was used for the entire third trimester of pregnancy (0.25 years), the entire infantile stage of life (0-2 years), and the first 1.17 years of the child stage of life (2-16 years). The results of our calculations are shown in the table below.

The Maximally Exposed Individual at an Existing Residential Receptor				
Age Group	Emissions Source	Duration (years)	Concentration (ug/m3)	Cancer Risk
3rd Trimester	Construction	0.25	0.2280	3.10E-06
Infant (0 - 2)	Construction	2	0.2280	7.49E-05
	Construction	1.17	0.2280	6.93E-06
	Operation	12.83	*	*
Child (2 - 16)	Total	14		6.93E-06
Adult (16 - 30)	Operation	14	*	*
Lifetime		30		8.49E-05

*Operational HRA not conducted.

The estimated excess cancer risks for the 3rd trimester of pregnancy, infants, and children at the MEIR located approximately 100 meters away, over the course of construction, are approximately 3.1, 74.9, and 6.93 in one million, respectively. The excess cancer risk over the course of construction is approximately 84.9 in one million. The infant and lifetime construction cancer risks exceed the SDAPCD's threshold of 10 in one million, resulting in a potentially significant impact not addressed or identified by the FEIR or associated documents.

Our analysis represents a screening-level HRA, which is known to be conservative. The purpose of the screening-level HRA is to demonstrate the potential link between project-generated emissions and

adverse health risk impacts. The U.S. EPA Exposure Assessment Guidelines suggest an iterative, tiered approach to exposure assessments, starting with a simple screening-level evaluation using basic tools and conservative assumptions.²¹ If required, a more refined analyses with advanced models and detailed input data can follow.

Our screening-level HRA demonstrates that construction of the Project could result in a potentially significant health risk impact. A revised EIR should therefore be prepared to include a refined HRA, as recommended by the U.S. EPA. If the refined analysis similarly reaches a determination of significant impact, then mitigation measures should be incorporated, as described in our “Feasible Mitigation Measures Available to Reduce Emissions” section below.

Mitigation

Feasible Mitigation Measures Available to Reduce Emissions

To reduce the ROG emissions associated with Project construction, we recommend the FEIR consider incorporating the following mitigation measure from the California Department of Justice (“DOJ”):²²

- Require the use of super compliant, low-VOC paints less than 10 g/L during the architectural coating construction phase and during Project maintenance.

Further mitigation used by other land use development projects to address ROG emissions is as follows:

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- Recycle leftover paint. Take any leftover paint to a household hazardous waste center; do not mix leftover water-based and oil-based paints.
- Keep lids closed on all paint containers when not in use to prevent ROG emissions and excessive odors.
- For water-based paints, clean up with water only. Whenever possible, do not rinse the cleanup water down the drain or pour it directly into the ground or the storm drain
- Use compliant low-ROG cleaning solvents to clean paint application equipment.
- Keep all paint- and solvent-laden rags in sealed containers to prevent ROG emissions.
- Contractors shall construct/build with materials that do not require painting and use pre-painted construction materials to the extent practicable.
- Use high-pressure/low-volume paint applicators with a minimum transfer efficiency of at least 50 percent or other application techniques with equivalent or higher transfer efficiency.
- Manual application using a paintbrush, hand-roller, trowel, spatula, dauber, rag, or sponge, to achieve a 100 percent application efficiency.

²¹ “Exposure Assessment Tools by Tiers and Types - Screening-Level and Refined.” U.S. EPA, May 2024, *available at*: <https://www.epa.gov/expobox/exposure-assessment-tools-tiers-and-types-screening-level-and-refined>.

²² “Warehouse Projects: Best Practices and Mitigation Measures to Comply with the California Environmental Quality Act.” State of California Department of Justice, September 2022, *available at*: <https://oag.ca.gov/system/files/media/warehouse-best-practices.pdf>, p. 8 – 10.

²³ “Banning Commerce Center Project.” Kimley-Horn and Associates, Inc., June 2024, *available at*: <https://ceganet.opr.ca.gov/2022090102/2>; Draft Environmental Impact Report, p. 1-7.

Additionally, Los Angeles County recommends:²⁴

- If paints and coatings with VOC content of 0 grams/liter to less than 10 grams/liter cannot be utilized, the developer shall avoid application of architectural coatings during the peak smog season: July, August, and September.

While the Project is not located in Los Angeles County, the use of low-ROG paints would nonetheless decrease the Project's significant ROG emissions.

To reduce the DPM emissions associated with Project construction, we recommend the FEIR consider several mitigation measures (see list below).

The Southern California Association of Governments ("SCAG")'s 2020 RTP/SCS Program Environmental Impact Report ("PEIR") Air Quality Project Level Mitigation Measures ("PMM-AQ-1") recommends the following.²⁵

- Minimize unnecessary vehicular and machinery activities.
- Require contractors to assemble a comprehensive inventory list (i.e., make, model, engine year, horsepower, emission rates) of all heavy-duty off-road (portable and mobile) equipment (50 horsepower and greater) that could be used an aggregate of 40 or more hours for the construction project.
- Ensure all construction equipment is properly tuned and maintained.
- Minimizing idling time to 5 minutes or beyond regulatory requirements —saves fuel and reduces emissions.
- Utilize existing power sources (e.g., power poles) or clean fuel generators rather than temporary power generators.
- Develop a traffic plan to minimize community impacts as a result of traffic flow interference from construction activities. The plan may include advance public notice of routing, use of public transportation, and satellite parking areas with a shuttle service. Schedule operations affecting traffic for off-peak hours. Minimize obstruction of through-traffic lanes. Provide a flag person to guide traffic properly and ensure safety at construction sites. Project sponsors should consider developing a goal for the minimization of community impacts.
- Require projects to use Tier 4 Final equipment or better for all engines above 50 horsepower (hp). In the event that construction equipment cannot meet to Tier 4 Final engine certification, the Project representative or contractor must demonstrate through future study with written findings supported by substantial evidence that is approved by SCAG before using other

²⁴ "Mitigation Monitoring and Reporting Program." Los Angeles County Housing Element Update Program EIR. August 2021, available at: https://planning.lacounty.gov/wp-content/uploads/2023/07/Housing_final-peir-mitigation-monitoring.pdf.

²⁵ "4.0 Mitigation Measures." Connect SoCal Program Environmental Impact Report Addendum #1, September 2020, available at: https://scag.ca.gov/sites/main/files/file-attachments/fpeir_connectsocial_addendum_4_mitigationmeasures.pdf?1606004420, p. 4.0-2 – 4.0-10; 4.0-19 – 4.0-23; See also: "Certified Final Connect SoCal Program Environmental Impact Report." SCAG, May 2020, available at: <https://scag.ca.gov/peir>.

technologies/strategies. Alternative applicable strategies may include, but would not be limited to, construction equipment with Tier 4 Interim or reduction in the number and/or horsepower rating of construction equipment and/or limiting the number of construction equipment operating at the same time. All equipment must be tuned and maintained in compliance with the manufacturer's recommended maintenance schedule and specifications. All maintenance records for each equipment and their contractor(s) should make available for inspection and remain on-site for a period of at least two years from completion of construction, unless the individual project can demonstrate that Tier 4 engines would not be required to mitigate emissions below significance thresholds. Project sponsors should also consider including ZE/ZNE technologies where appropriate and feasible.

The CalEEMod User's Guide confirms that the methods for mitigating DPM emissions include the use of "alternative fuel, electric equipment, diesel particulate filters, oxidation catalysts, newer tier engines, and dust suppression."²⁶

Provided above are several mitigation measures that would reduce Project-related DPM emissions developed from sources including SCAG. These measures offer a cost-effective, feasible way to incorporate lower-emitting design features into the proposed Project, which subsequently reduce emissions released during Project construction.

A revised EIR should be prepared that includes all feasible mitigation measures, as well as updated air quality and health risk to ensure that the necessary mitigation measures are implemented to reduce emissions to the maximum extent feasible. The revised EIR should also demonstrate a commitment to the implementation of these measures prior to Project approval, to ensure that the Project's potentially significant emissions are reduced to the maximum extent possible.

Disclaimer

SWAPE has received limited discovery regarding this project. Additional information may become available in the future; thus, we retain the right to revise or amend this report when additional information becomes available. Our professional services have been performed using that degree of care and skill ordinarily exercised, under similar circumstances, by reputable environmental consultants practicing in this or similar localities at the time of service. No other warranty, expressed or implied, is made as to the scope of work, work methodologies and protocols, site conditions, analytical testing results, and findings presented. This report reflects efforts which were limited to information that was reasonably accessible at the time of the work, and may contain informational gaps, inconsistencies, or otherwise be incomplete due to the unavailability or uncertainty of information obtained or provided by third parties.

²⁶ "Calculation Details for CalEEMod." CAPCOA, May 2021, available at: <http://www.agmd.gov/docs/default-source/caleemod/user-guide-2021/appendix-a2020-4-0.pdf?sfvrsn=6>, Appendix A, p. 60.

Sincerely,

A handwritten signature in blue ink, appearing to read "Matt Hagemann".

Matt Hagemann, P.G., C.Hg.

A handwritten signature in blue ink, appearing to read "Paul Rosenfeld".

Paul E. Rosenfeld, Ph.D.

Attachment A: CalEEMod Output Files
Attachment B: Health Risk Calculations
Attachment C: AERSCREEN Output Files
Attachment D: Matt Hagemann CV
Attachment E: Paul Rosenfeld CV

AVA Pacific Beach Detailed Report

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 - 1.2. Land Use Types
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- 2. Emissions Summary
 - 2.1. Construction Emissions Compared Against Thresholds
 - 2.2. Construction Emissions by Year, Unmitigated
- 3. Construction Emissions Details
 - 3.1. Demolition (2024) - Unmitigated
 - 3.3. Site Preparation (2024) - Unmitigated
 - 3.5. Grading (2024) - Unmitigated
 - 3.7. Building Construction (2024) - Unmitigated
 - 3.9. Building Construction (2025) - Unmitigated
 - 3.11. Paving (2025) - Unmitigated
 - 3.13. Architectural Coating (2025) - Unmitigated

4. Operations Emissions Details

4.10. Soil Carbon Accumulation By Vegetation Type

4.10.1. Soil Carbon Accumulation By Vegetation Type - Unmitigated

4.10.2. Above and Belowground Carbon Accumulation by Land Use Type - Unmitigated

4.10.3. Avoided and Sequestered Emissions by Species - Unmitigated

5. Activity Data

5.1. Construction Schedule

5.2. Off-Road Equipment

5.2.1. Unmitigated

5.3. Construction Vehicles

5.3.1. Unmitigated

5.4. Vehicles

5.4.1. Construction Vehicle Control Strategies

5.5. Architectural Coatings

5.6. Dust Mitigation

5.6.1. Construction Earthmoving Activities

5.6.2. Construction Earthmoving Control Strategies

5.7. Construction Paving

5.8. Construction Electricity Consumption and Emissions Factors

5.18. Vegetation

5.18.1. Land Use Change

5.18.1.1. Unmitigated

5.18.1. Biomass Cover Type

5.18.1.1. Unmitigated

5.18.2. Sequestration

5.18.2.1. Unmitigated

6. Climate Risk Detailed Report

6.1. Climate Risk Summary

6.2. Initial Climate Risk Scores

6.3. Adjusted Climate Risk Scores

6.4. Climate Risk Reduction Measures

7. Health and Equity Details

7.1. CalEnviroScreen 4.0 Scores

7.2. Healthy Places Index Scores

7.3. Overall Health & Equity Scores

7.4. Health & Equity Measures

7.5. Evaluation Scorecard

7.6. Health & Equity Custom Measures

8. User Changes to Default Data

1. Basic Project Information

1.1. Basic Project Information

Data Field	Value
Project Name	AVA Pacific Beach
Construction Start Date	6/3/2024
Lead Agency	—
Land Use Scale	Project/site
Analysis Level for Defaults	County
Windspeed (m/s)	2.70
Precipitation (days)	19.0
Location	3883 Ingraham St, San Diego, CA 92109, USA
County	San Diego
City	San Diego
Air District	San Diego County APCD
Air Basin	San Diego
TAZ	6310
EDFZ	12
Electric Utility	San Diego Gas & Electric
Gas Utility	San Diego Gas & Electric
App Version	2022.1.1.30

1.2. Land Use Types

Land Use Subtype	Size	Unit	Lot Acreage	Building Area (sq ft)	Landscape Area (sq ft)	Special Landscape Area (sq ft)	Population	Description
Apartments Mid Rise	138	Dwelling Unit	0.90	344,437	—	—	385	—

Enclosed Parking with Elevator	614	Space	1.49	245,600	—	—	—	—
Parking Lot	20.0	Space	0.18	0.00	—	—	—	—

1.3. User-Selected Emission Reduction Measures by Emissions Sector

No measures selected

2. Emissions Summary

2.1. Construction Emissions Compared Against Thresholds

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Un/Mit.	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	219	219	28.7	22.8	0.09	0.85	14.1	14.9	0.79	3.56	4.27	—	12,315	12,315	0.63	1.58	21.3	12,823
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	2.61	2.21	14.0	21.6	0.03	0.48	2.06	2.54	0.44	0.50	0.94	—	5,453	5,453	0.25	0.28	0.30	5,544
Average Daily (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	6.70	6.59	6.62	8.72	0.02	0.22	1.58	1.80	0.20	0.36	0.56	—	2,575	2,575	0.12	0.19	2.17	2,636
Annual (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	1.22	1.20	1.21	1.59	< 0.005	0.04	0.29	0.33	0.04	0.06	0.10	—	426	426	0.02	0.03	0.36	436

2.2. Construction Emissions by Year, Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Year	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
------	-----	-----	-----	----	-----	-------	-------	-------	--------	--------	--------	------	-------	------	-----	-----	---	------

Daily - Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2024	2.72	2.22	28.7	22.8	0.09	0.85	14.1	14.9	0.79	3.56	4.27	—	12,315	12,315	0.63	1.58	21.3	12,823
2025	219	219	13.0	22.1	0.03	0.42	2.06	2.49	0.39	0.50	0.89	—	5,499	5,499	0.24	0.28	10.8	5,599
Daily - Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2024	2.61	2.21	14.0	21.6	0.03	0.48	2.06	2.54	0.44	0.50	0.94	—	5,453	5,453	0.25	0.28	0.30	5,544
2025	2.48	2.09	13.2	20.9	0.03	0.42	2.06	2.49	0.39	0.50	0.89	—	5,393	5,393	0.25	0.28	0.28	5,484
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2024	1.06	0.87	6.62	8.72	0.02	0.22	1.58	1.80	0.20	0.36	0.56	—	2,575	2,575	0.12	0.19	2.17	2,636
2025	6.70	6.59	3.81	6.09	0.01	0.12	0.57	0.70	0.11	0.14	0.25	—	1,533	1,533	0.07	0.08	1.30	1,560
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2024	0.19	0.16	1.21	1.59	< 0.005	0.04	0.29	0.33	0.04	0.06	0.10	—	426	426	0.02	0.03	0.36	436
2025	1.22	1.20	0.69	1.11	< 0.005	0.02	0.10	0.13	0.02	0.03	0.05	—	254	254	0.01	0.01	0.22	258

3. Construction Emissions Details

3.1. Demolition (2024) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.92	1.61	15.6	16.0	0.02	0.67	—	0.67	0.62	—	0.62	—	2,494	2,494	0.10	0.02	—	2,502

Demolition	—	—	—	—	—	—	11.5	11.5	—	1.74	1.74	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.11	0.09	0.85	0.88	< 0.005	0.04	—	0.04	0.03	—	0.03	—	137	137	0.01	< 0.005	—	137
Demolition	—	—	—	—	—	—	0.63	0.63	—	0.10	0.10	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.02	0.02	0.16	0.16	< 0.005	0.01	—	0.01	0.01	—	0.01	—	22.6	22.6	< 0.005	< 0.005	—	22.7
Demolition	—	—	—	—	—	—	0.11	0.11	—	0.02	0.02	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.06	0.05	0.04	0.62	0.00	0.00	0.11	0.11	0.00	0.02	0.02	—	121	121	0.01	< 0.005	0.49	123
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.74	0.21	13.1	4.65	0.06	0.17	2.45	2.63	0.17	0.67	0.85	—	9,701	9,701	0.52	1.55	20.8	10,198

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.03	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	6.31	6.31	< 0.005	< 0.005	0.01	6.40
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.04	0.01	0.74	0.26	< 0.005	0.01	0.13	0.14	0.01	0.04	0.05	—	532	532	0.03	0.09	0.49	558
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.01	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	1.05	1.05	< 0.005	< 0.005	< 0.005	1.06
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.01	< 0.005	0.14	0.05	< 0.005	< 0.005	0.02	0.03	< 0.005	0.01	0.01	—	88.0	88.0	< 0.005	0.01	0.08	92.4

3.3. Site Preparation (2024) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.56	1.31	12.7	11.4	0.03	0.55	—	0.55	0.51	—	0.51	—	2,716	2,716	0.11	0.02	—	2,725
Dust From Material Movement	—	—	—	—	—	—	1.59	1.59	—	0.17	0.17	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.01	0.01	0.10	0.09	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	22.3	22.3	< 0.005	< 0.005	—	22.4
Dust From Material Movement	—	—	—	—	—	—	0.01	0.01	—	< 0.005	< 0.005	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	< 0.005	< 0.005	0.02	0.02	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	3.70	3.70	< 0.005	< 0.005	—	3.71
Dust From Material Movement	—	—	—	—	—	—	< 0.005	< 0.005	—	< 0.005	< 0.005	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.03	0.03	0.03	0.37	0.00	0.00	0.06	0.06	0.00	0.01	0.01	—	72.6	72.6	< 0.005	< 0.005	0.29	73.7
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	< 0.005	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	0.57	0.57	< 0.005	< 0.005	< 0.005	0.58

Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	< 0.005	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	0.09	0.09	< 0.005	< 0.005	< 0.005	0.10
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.5. Grading (2024) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.96	1.65	15.9	15.4	0.02	0.74	—	0.74	0.68	—	0.68	—	2,454	2,454	0.10	0.02	—	2,462
Dust From Material Movement	—	—	—	—	—	—	7.09	7.09	—	3.43	3.43	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.03	0.03	0.26	0.25	< 0.005	0.01	—	0.01	0.01	—	0.01	—	40.3	40.3	< 0.005	< 0.005	—	40.5

Dust From Material Movement	—	—	—	—	—	—	0.12	0.12	—	0.06	0.06	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.01	< 0.005	0.05	0.05	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	6.68	6.68	< 0.005	< 0.005	—	6.70
Dust From Material Movement	—	—	—	—	—	—	0.02	0.02	—	0.01	0.01	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.05	0.04	0.03	0.49	0.00	0.00	0.08	0.08	0.00	0.02	0.02	—	96.8	96.8	< 0.005	< 0.005	0.39	98.3
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.13	0.04	2.24	0.80	0.01	0.03	0.42	0.45	0.03	0.12	0.15	—	1,663	1,663	0.09	0.27	3.57	1,748
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.01	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	1.52	1.52	< 0.005	< 0.005	< 0.005	1.54
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	< 0.005	< 0.005	0.04	0.01	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	27.3	27.3	< 0.005	< 0.005	0.03	28.7
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	< 0.005	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	0.25	0.25	< 0.005	< 0.005	< 0.005	0.25

Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	< 0.005	< 0.005	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	4.53	4.53	< 0.005	< 0.005	< 0.005	4.75

3.7. Building Construction (2024) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.58	1.32	11.2	11.9	0.02	0.46	—	0.46	0.42	—	0.42	—	2,201	2,201	0.09	0.02	—	2,209
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.58	1.32	11.2	11.9	0.02	0.46	—	0.46	0.42	—	0.42	—	2,201	2,201	0.09	0.02	—	2,209
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.52	0.44	3.72	3.95	0.01	0.15	—	0.15	0.14	—	0.14	—	728	728	0.03	0.01	—	730
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Off-Road Equipment	0.10	0.08	0.68	0.72	< 0.005	0.03	—	0.03	0.03	—	0.03	—	121	121	< 0.005	< 0.005	—	121
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.92	0.85	0.68	10.0	0.00	0.00	1.71	1.71	0.00	0.40	0.40	—	1,959	1,959	0.09	0.07	7.87	1,991
Vendor	0.12	0.06	1.93	0.89	0.01	0.02	0.35	0.37	0.02	0.10	0.12	—	1,401	1,401	0.06	0.19	3.60	1,464
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.91	0.84	0.75	8.77	0.00	0.00	1.71	1.71	0.00	0.40	0.40	—	1,850	1,850	0.10	0.07	0.20	1,874
Vendor	0.12	0.05	2.00	0.92	0.01	0.02	0.35	0.37	0.02	0.10	0.12	—	1,402	1,402	0.06	0.19	0.09	1,462
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.30	0.27	0.25	2.94	0.00	0.00	0.56	0.56	0.00	0.13	0.13	—	617	617	0.03	0.02	1.12	626
Vendor	0.04	0.02	0.66	0.30	< 0.005	0.01	0.12	0.12	0.01	0.03	0.04	—	464	464	0.02	0.06	0.51	484
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.05	0.05	0.05	0.54	0.00	0.00	0.10	0.10	0.00	0.02	0.02	—	102	102	0.01	< 0.005	0.19	104
Vendor	0.01	< 0.005	0.12	0.05	< 0.005	< 0.005	0.02	0.02	< 0.005	0.01	0.01	—	76.7	76.7	< 0.005	0.01	0.08	80.1
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.9. Building Construction (2025) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.49	1.24	10.6	11.9	0.02	0.40	—	0.40	0.37	—	0.37	—	2,201	2,201	0.09	0.02	—	2,209
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.49	1.24	10.6	11.9	0.02	0.40	—	0.40	0.37	—	0.37	—	2,201	2,201	0.09	0.02	—	2,209
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.41	0.34	2.90	3.25	0.01	0.11	—	0.11	0.10	—	0.10	—	603	603	0.02	< 0.005	—	605
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.07	0.06	0.53	0.59	< 0.005	0.02	—	0.02	0.02	—	0.02	—	99.8	99.8	< 0.005	< 0.005	—	100
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Worker	0.89	0.82	0.62	9.38	0.00	0.00	1.71	1.71	0.00	0.40	0.40	—	1,921	1,921	0.09	0.07	7.21	1,951
Vendor	0.12	0.06	1.83	0.85	0.01	0.02	0.35	0.37	0.02	0.10	0.12	—	1,377	1,377	0.06	0.19	3.57	1,440
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.87	0.80	0.69	8.21	0.00	0.00	1.71	1.71	0.00	0.40	0.40	—	1,814	1,814	0.10	0.07	0.19	1,838
Vendor	0.12	0.05	1.90	0.88	0.01	0.02	0.35	0.37	0.02	0.10	0.12	—	1,377	1,377	0.06	0.19	0.09	1,437
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.24	0.22	0.19	2.28	0.00	0.00	0.46	0.46	0.00	0.11	0.11	—	502	502	0.03	0.02	0.85	509
Vendor	0.03	0.01	0.52	0.24	< 0.005	0.01	0.10	0.10	0.01	0.03	0.03	—	377	377	0.02	0.05	0.42	394
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.04	0.04	0.03	0.42	0.00	0.00	0.08	0.08	0.00	0.02	0.02	—	83.0	83.0	< 0.005	< 0.005	0.14	84.2
Vendor	0.01	< 0.005	0.09	0.04	< 0.005	< 0.005	0.02	0.02	< 0.005	< 0.005	0.01	—	62.5	62.5	< 0.005	0.01	0.07	65.2
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.11. Paving (2025) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.83	0.70	6.13	8.21	0.01	0.27	—	0.27	0.25	—	0.25	—	1,244	1,244	0.05	0.01	—	1,248
Paving	0.44	0.44	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.02	0.02	0.17	0.23	< 0.005	0.01	—	0.01	0.01	—	0.01	—	34.1	34.1	< 0.005	< 0.005	—	34.2
Paving	0.01	0.01	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	< 0.005	< 0.005	0.03	0.04	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	5.64	5.64	< 0.005	< 0.005	—	5.66
Paving	< 0.005	< 0.005	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.07	0.06	0.05	0.69	0.00	0.00	0.13	0.13	0.00	0.03	0.03	—	142	142	0.01	< 0.005	0.53	144
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.02	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	3.71	3.71	< 0.005	< 0.005	0.01	3.77

Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	< 0.005	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	0.62	0.62	< 0.005	< 0.005	< 0.005	0.62
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.13. Architectural Coating (2025) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.15	0.13	0.88	1.14	< 0.005	0.03	—	0.03	0.03	—	0.03	—	134	134	0.01	< 0.005	—	134
Architectural Coatings	218	218	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	< 0.005	< 0.005	0.02	0.03	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	3.66	3.66	< 0.005	< 0.005	—	3.67

Architect ural	5.98	5.98	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipm ent	< 0.005	< 0.005	< 0.005	0.01	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	0.61	0.61	< 0.005	< 0.005	—	0.61
Architect ural Coating s	1.09	1.09	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.18	0.16	0.12	1.88	0.00	0.00	0.34	0.34	0.00	0.08	0.08	—	384	384	0.02	0.01	1.44	390
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.05	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	10.0	10.0	< 0.005	< 0.005	0.02	10.2
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.01	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	1.66	1.66	< 0.005	< 0.005	< 0.005	1.68
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

4. Operations Emissions Details

4.10. Soil Carbon Accumulation By Vegetation Type

4.10.1. Soil Carbon Accumulation By Vegetation Type - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Vegetation	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10.2. Above and Belowground Carbon Accumulation by Land Use Type - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
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4.10.3. Avoided and Sequestered Emissions by Species - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Species	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

5. Activity Data

5.1. Construction Schedule

Phase Name	Phase Type	Start Date	End Date	Days Per Week	Work Days per Phase	Phase Description
Demolition	Demolition	6/3/2024	7/1/2024	5.00	20.0	—
Site Preparation	Site Preparation	7/2/2024	7/6/2024	5.00	3.00	—
Grading	Grading	7/7/2024	7/15/2024	5.00	6.00	—
Building Construction	Building Construction	7/16/2024	5/20/2025	5.00	220	—
Paving	Paving	5/21/2025	6/4/2025	5.00	10.0	—
Architectural Coating	Architectural Coating	6/5/2025	6/19/2025	5.00	10.0	—

5.2. Off-Road Equipment

5.2.1. Unmitigated

Phase Name	Equipment Type	Fuel Type	Engine Tier	Number per Day	Hours Per Day	Horsepower	Load Factor
Demolition	Concrete/Industrial Saws	Diesel	Average	1.00	8.00	33.0	0.73
Demolition	Rubber Tired Dozers	Diesel	Average	1.00	8.00	367	0.40
Demolition	Tractors/Loaders/Back hoes	Diesel	Average	3.00	8.00	84.0	0.37

Site Preparation	Tractors/Loaders/Back	Diesel	Average	1.00	7.00	84.0	0.37
Site Preparation	Graders	Diesel	Average	1.00	8.00	148	0.41
Site Preparation	Scrapers	Diesel	Average	1.00	8.00	423	0.48
Grading	Graders	Diesel	Average	1.00	8.00	148	0.41
Grading	Rubber Tired Dozers	Diesel	Average	1.00	8.00	367	0.40
Grading	Tractors/Loaders/Back hoes	Diesel	Average	2.00	7.00	84.0	0.37
Building Construction	Cranes	Diesel	Average	1.00	8.00	367	0.29
Building Construction	Forklifts	Diesel	Average	2.00	7.00	82.0	0.20
Building Construction	Generator Sets	Diesel	Average	1.00	8.00	14.0	0.74
Building Construction	Tractors/Loaders/Back hoes	Diesel	Average	1.00	6.00	84.0	0.37
Building Construction	Welders	Diesel	Average	3.00	8.00	46.0	0.45
Paving	Pavers	Diesel	Average	1.00	8.00	81.0	0.42
Paving	Paving Equipment	Diesel	Average	1.00	8.00	89.0	0.36
Paving	Rollers	Diesel	Average	2.00	8.00	36.0	0.38
Paving	Cement and Mortar Mixers	Diesel	Average	1.00	8.00	10.0	0.56
Paving	Tractors/Loaders/Back hoes	Diesel	Average	1.00	8.00	84.0	0.37
Architectural Coating	Air Compressors	Diesel	Average	1.00	6.00	37.0	0.48

5.3. Construction Vehicles

5.3.1. Unmitigated

Phase Name	Trip Type	One-Way Trips per Day	Miles per Trip	Vehicle Mix
Demolition	—	—	—	—
Demolition	Worker	12.5	12.0	LDA,LDT1,LDT2
Demolition	Vendor	—	7.63	HHDT,MHDT
Demolition	Hauling	132	20.0	HHDT

Demolition	Onsite truck	—	—	HHDT
Site Preparation	—	—	—	—
Site Preparation	Worker	7.50	12.0	LDA,LDT1,LDT2
Site Preparation	Vendor	—	7.63	HHDT,MHDT
Site Preparation	Hauling	0.00	20.0	HHDT
Site Preparation	Onsite truck	—	—	HHDT
Grading	—	—	—	—
Grading	Worker	10.0	12.0	LDA,LDT1,LDT2
Grading	Vendor	—	7.63	HHDT,MHDT
Grading	Hauling	22.7	20.0	HHDT
Grading	Onsite truck	—	—	HHDT
Building Construction	—	—	—	—
Building Construction	Worker	203	12.0	LDA,LDT1,LDT2
Building Construction	Vendor	55.0	7.63	HHDT,MHDT
Building Construction	Hauling	0.00	20.0	HHDT
Building Construction	Onsite truck	—	—	HHDT
Paving	—	—	—	—
Paving	Worker	15.0	12.0	LDA,LDT1,LDT2
Paving	Vendor	—	7.63	HHDT,MHDT
Paving	Hauling	0.00	20.0	HHDT
Paving	Onsite truck	—	—	HHDT
Architectural Coating	—	—	—	—
Architectural Coating	Worker	40.5	12.0	LDA,LDT1,LDT2
Architectural Coating	Vendor	—	7.63	HHDT,MHDT
Architectural Coating	Hauling	0.00	20.0	HHDT
Architectural Coating	Onsite truck	—	—	HHDT

5.4. Vehicles

5.4.1. Construction Vehicle Control Strategies

Non-applicable. No control strategies activated by user.

5.5. Architectural Coatings

Phase Name	Residential Interior Area Coated (sq ft)	Residential Exterior Area Coated (sq ft)	Non-Residential Interior Area Coated (sq ft)	Non-Residential Exterior Area Coated (sq ft)	Parking Area Coated (sq ft)
Architectural Coating	697,485	232,495	2,921	325	4,365

5.6. Dust Mitigation

5.6.1. Construction Earthmoving Activities

Phase Name	Material Imported (Cubic Yards)	Material Exported (Cubic Yards)	Acres Graded (acres)	Material Demolished (Ton of Debris)	Acres Paved (acres)
Demolition	0.00	0.00	0.00	10,578	—
Site Preparation	—	—	97.5	0.00	—
Grading	1,087	—	87.0	0.00	—
Paving	0.00	0.00	0.00	0.00	1.67

5.6.2. Construction Earthmoving Control Strategies

Non-applicable. No control strategies activated by user.

5.7. Construction Paving

Land Use	Area Paved (acres)	% Asphalt
Apartments Mid Rise	—	0%
Enclosed Parking with Elevator	1.49	100%
Parking Lot	0.18	100%

5.8. Construction Electricity Consumption and Emissions Factors

kWh per Year and Emission Factor (lb/MWh)

Year	kWh per Year	CO2	CH4	N2O
2024	0.00	589	0.03	< 0.005
2025	0.00	589	0.03	< 0.005

5.18. Vegetation

5.18.1. Land Use Change

5.18.1.1. Unmitigated

Vegetation Land Use Type	Vegetation Soil Type	Initial Acres	Final Acres
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5.18.1. Biomass Cover Type

5.18.1.1. Unmitigated

Biomass Cover Type	Initial Acres	Final Acres
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5.18.2. Sequestration

5.18.2.1. Unmitigated

Tree Type	Number	Electricity Saved (kWh/year)	Natural Gas Saved (btu/year)
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6. Climate Risk Detailed Report

6.1. Climate Risk Summary

Cal-Adapt midcentury 2040–2059 average projections for four hazards are reported below for your project location. These are under Representation Concentration Pathway (RCP) 8.5 which assumes GHG emissions will continue to rise strongly through 2050 and then plateau around 2100.

Climate Hazard	Result for Project Location	Unit
Temperature and Extreme Heat	7.67	annual days of extreme heat
Extreme Precipitation	2.70	annual days with precipitation above 20 mm

Sea Level Rise	—	meters of inundation depth
Wildfire	1.93	annual hectares burned

Temperature and Extreme Heat data are for grid cell in which your project are located. The projection is based on the 98th historical percentile of daily maximum/minimum temperatures from observed historical data (32 climate model ensemble from Cal-Adapt, 2040–2059 average under RCP 8.5). Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.

Extreme Precipitation data are for the grid cell in which your project are located. The threshold of 20 mm is equivalent to about $\frac{3}{4}$ an inch of rain, which would be light to moderate rainfall if received over a full day or heavy rain if received over a period of 2 to 4 hours. Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.

Sea Level Rise data are for the grid cell in which your project are located. The projections are from Radke et al. (2017), as reported in Cal-Adapt (Radke et al., 2017, CEC-500-2017-008), and consider inundation location and depth for the San Francisco Bay, the Sacramento-San Joaquin River Delta and California coast resulting different increments of sea level rise coupled with extreme storm events. Users may select from four scenarios to view the range in potential inundation depth for the grid cell. The four scenarios are: No rise, 0.5 meter, 1.0 meter, 1.41 meters

Wildfire data are for the grid cell in which your project are located. The projections are from UC Davis, as reported in Cal-Adapt (2040–2059 average under RCP 8.5), and consider historical data of climate, vegetation, population density, and large (> 400 ha) fire history. Users may select from four model simulations to view the range in potential wildfire probabilities for the grid cell. The four simulations make different assumptions about expected rainfall and temperature are: Warmer/drier (HadGEM2-ES), Cooler/wetter (CNRM-CM5), Average conditions (CanESM2), Range of different rainfall and temperature possibilities (MIROC5). Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.

6.2. Initial Climate Risk Scores

Climate Hazard	Exposure Score	Sensitivity Score	Adaptive Capacity Score	Vulnerability Score
Temperature and Extreme Heat	N/A	N/A	N/A	N/A
Extreme Precipitation	N/A	N/A	N/A	N/A
Sea Level Rise	1	0	0	N/A
Wildfire	1	0	0	N/A
Flooding	0	0	0	N/A
Drought	N/A	N/A	N/A	N/A
Snowpack Reduction	N/A	N/A	N/A	N/A
Air Quality Degradation	N/A	N/A	N/A	N/A

The sensitivity score reflects the extent to which a project would be adversely affected by exposure to a climate hazard. Exposure is rated on a scale of 1 to 5, with a score of 5 representing the greatest exposure.

The adaptive capacity of a project refers to its ability to manage and reduce vulnerabilities from projected climate hazards. Adaptive capacity is rated on a scale of 1 to 5, with a score of 5 representing the greatest ability to adapt.

The overall vulnerability scores are calculated based on the potential impacts and adaptive capacity assessments for each hazard. Scores do not include implementation of climate risk reduction measures.

6.3. Adjusted Climate Risk Scores

Climate Hazard	Exposure Score	Sensitivity Score	Adaptive Capacity Score	Vulnerability Score
Temperature and Extreme Heat	N/A	N/A	N/A	N/A

Extreme Precipitation	N/A	N/A	N/A	N/A
Sea Level Rise	1	1	1	2
Wildfire	1	1	1	2
Flooding	1	1	1	2
Drought	N/A	N/A	N/A	N/A
Snowpack Reduction	N/A	N/A	N/A	N/A
Air Quality Degradation	N/A	N/A	N/A	N/A

The sensitivity score reflects the extent to which a project would be adversely affected by exposure to a climate hazard. Exposure is rated on a scale of 1 to 5, with a score of 5 representing the greatest exposure.

The adaptive capacity of a project refers to its ability to manage and reduce vulnerabilities from projected climate hazards. Adaptive capacity is rated on a scale of 1 to 5, with a score of 5 representing the greatest ability to adapt.

The overall vulnerability scores are calculated based on the potential impacts and adaptive capacity assessments for each hazard. Scores include implementation of climate risk reduction measures.

6.4. Climate Risk Reduction Measures

7. Health and Equity Details

7.1. CalEnviroScreen 4.0 Scores

The maximum CalEnviroScreen score is 100. A high score (i.e., greater than 50) reflects a higher pollution burden compared to other census tracts in the state.

Indicator	Result for Project Census Tract
Exposure Indicators	—
AQ-Ozone	35.2
AQ-PM	47.8
AQ-DPM	21.1
Drinking Water	29.0
Lead Risk Housing	24.8
Pesticides	0.00
Toxic Releases	34.7
Traffic	31.6
Effect Indicators	—

CleanUp Sites	0.00
Groundwater	0.00
Haz Waste Facilities/Generators	11.1
Impaired Water Bodies	51.2
Solid Waste	0.00
Sensitive Population	—
Asthma	6.42
Cardio-vascular	13.0
Low Birth Weights	0.90
Socioeconomic Factor Indicators	—
Education	10.8
Housing	81.9
Linguistic	31.3
Poverty	33.8
Unemployment	8.69

7.2. Healthy Places Index Scores

The maximum Health Places Index score is 100. A high score (i.e., greater than 50) reflects healthier community conditions compared to other census tracts in the state.

Indicator	Result for Project Census Tract
Economic	—
Above Poverty	56.93571154
Employed	94.72603619
Median HI	43.60323367
Education	—
Bachelor's or higher	83.38252278
High school enrollment	100
Preschool enrollment	77.6337739
Transportation	—

Auto Access	92.6344155
Active commuting	77.18465289
Social	—
2-parent households	63.06942128
Voting	53.07327088
Neighborhood	—
Alcohol availability	29.66765046
Park access	81.35506224
Retail density	33.47876299
Supermarket access	36.64827409
Tree canopy	12.61388426
Housing	—
Homeownership	13.48646221
Housing habitability	30.71987681
Low-inc homeowner severe housing cost burden	6.73681509
Low-inc renter severe housing cost burden	46.10547928
Uncrowded housing	96.93314513
Health Outcomes	—
Insured adults	43.11561658
Arthritis	97.1
Asthma ER Admissions	88.6
High Blood Pressure	98.5
Cancer (excluding skin)	77.2
Asthma	58.2
Coronary Heart Disease	96.5
Chronic Obstructive Pulmonary Disease	91.4
Diagnosed Diabetes	98.6
Life Expectancy at Birth	57.3

Cognitively Disabled	94.6
Physically Disabled	91.7
Heart Attack ER Admissions	83.4
Mental Health Not Good	61.1
Chronic Kidney Disease	98.0
Obesity	83.6
Pedestrian Injuries	57.5
Physical Health Not Good	95.9
Stroke	96.9
Health Risk Behaviors	—
Binge Drinking	0.4
Current Smoker	56.8
No Leisure Time for Physical Activity	93.0
Climate Change Exposures	—
Wildfire Risk	0.0
SLR Inundation Area	0.0
Children	93.4
Elderly	80.0
English Speaking	95.7
Foreign-born	12.5
Outdoor Workers	83.1
Climate Change Adaptive Capacity	—
Impervious Surface Cover	6.3
Traffic Density	41.7
Traffic Access	55.3
Other Indices	—
Hardship	5.4
Other Decision Support	—

2016 Voting	70.1
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7.3. Overall Health & Equity Scores

Metric	Result for Project Census Tract
CalEnviroScreen 4.0 Score for Project Location (a)	4.00
Healthy Places Index Score for Project Location (b)	75.0
Project Located in a Designated Disadvantaged Community (Senate Bill 535)	No
Project Located in a Low-Income Community (Assembly Bill 1550)	No
Project Located in a Community Air Protection Program Community (Assembly Bill 617)	No

a: The maximum CalEnviroScreen score is 100. A high score (i.e., greater than 50) reflects a higher pollution burden compared to other census tracts in the state.

b: The maximum Health Places Index score is 100. A high score (i.e., greater than 50) reflects healthier community conditions compared to other census tracts in the state.

7.4. Health & Equity Measures

No Health & Equity Measures selected.

7.5. Evaluation Scorecard

Health & Equity Evaluation Scorecard not completed.

7.6. Health & Equity Custom Measures

No Health & Equity Custom Measures created.

8. User Changes to Default Data

Screen	Justification
Construction: Dust From Material Movement	Consistent with FEIR's model.
Land Use	Consistent with FEIR's model.

Construction			
2024		Total	
Annual Emissions (tons/year)	0.05	Total DPM (lbs)	328.7123288
Daily Emissions (lbs/day)	0.273972603	Total DPM (g)	149103.9123
Construction Duration (days)	212	Emission Rate (g/s)	0.001380592
Total DPM (lbs)	58.08219178	Release Height (meters)	3
Total DPM (g)	26346.08219	Total Acreage	4.35
Start Date	6/3/2024	Max Horizontal (meters)	187.64
End Date	1/1/2025	Min Horizontal (meters)	93.82
Construction Days	212	Initial Vertical Dimension (meters)	1.5
2025		Setting	Urban
Annual Emissions (tons/year)	0.06	Population	1,404,452
Daily Emissions (lbs/day)	0.328767123	Start Date	6/3/2024
Construction Duration (days)	365	End Date	11/5/2027
Total DPM (lbs)	120	Total Construction Days	1250
Total DPM (g)	54432	Total Years of Construction	3.42
Start Date	1/1/2025	Total Years of Operation	26.58
End Date	1/1/2026		
Construction Days	365		
2026			
Annual Emissions (tons/year)	0.05		
Daily Emissions (lbs/day)	0.273972603		
Construction Duration (days)	365		
Total DPM (lbs)	100		
Total DPM (g)	45360		
Start Date	1/1/2026		
End Date	1/1/2027		
Construction Days	365		
2027			
Annual Emissions (tons/year)	0.03		
Daily Emissions (lbs/day)	0.164383562		
Construction Duration (days)	308		
Total DPM (lbs)	50.63013699		
Total DPM (g)	22965.83014		
Start Date	1/1/2027		
End Date	11/5/2027		
Construction Days	308		

The Maximally Exposed Individual at an Existing Residential Receptor				
Age Group	Emissions Source	Duration (years)	Concentration (ug/m3)	Cancer Risk
3rd Trimester	Construction	0.25	0.2280	3.10E-06
Infant (0 - 2)	Construction	2	0.2280	7.49E-05
Child (2 - 16)	<i>Construction</i>	<i>1.17</i>	<i>0.2280</i>	<i>6.93E-06</i>
	<i>Operation</i>	<i>12.83</i>	<i>x</i>	<i>x</i>
	Total	14		6.93E-06
Adult (16 - 30)	Operation	14	x	x
Lifetime		30		8.49E-05

AERSCREEN 21112 / AERMOD 21112

08/27/25

15:00:54

TITLE: AVA Pacific, Construction

 ***** AREA PARAMETERS *****

SOURCE EMISSION RATE:	0.138E-02 g/s	0.110E-01 lb/hr
AREA EMISSION RATE:	0.784E-07 g/(s-m2)	0.622E-06 lb/(hr-m2)
AREA HEIGHT:	3.00 meters	9.84 feet
AREA SOURCE LONG SIDE:	187.64 meters	615.62 feet
AREA SOURCE SHORT SIDE:	93.82 meters	307.81 feet
INITIAL VERTICAL DIMENSION:	1.50 meters	4.92 feet
RURAL OR URBAN:	URBAN	
POPULATION:	1404452	
INITIAL PROBE DISTANCE =	5000. meters	16404. feet

 ***** BUILDING DOWNWASH PARAMETERS *****

BUILDING DOWNWASH NOT USED FOR NON-POINT SOURCES

 ***** FLOW SECTOR ANALYSIS *****
 25 meter receptor spacing: 1. meters - 5000. meters

MAXIMUM IMPACT RECEPTOR

Zo SECTOR	SURFACE ROUGHNESS	1-HR CONC (ug/m3)	RADIAL (deg)	DIST (m)	TEMPORAL PERIOD
1*	1.000	2.280	20	100.0	WIN

* = worst case diagonal

***** MAKEMET METEOROLOGY PARAMETERS *****

MIN/MAX TEMPERATURE: 250.0 / 310.0 (K)

MINIMUM WIND SPEED: 0.5 m/s

ANEMOMETER HEIGHT: 10.000 meters

SURFACE CHARACTERISTICS INPUT: AERMET SEASONAL TABLES

DOMINANT SURFACE PROFILE: Urban

DOMINANT CLIMATE TYPE: Average Moisture

DOMINANT SEASON: Winter

ALBEDO: 0.35

BOWEN RATIO: 1.50

ROUGHNESS LENGTH: 1.000 (meters)

SURFACE FRICTION VELOCITY (U*) NOT ADJUSTED

METEOROLOGY CONDITIONS USED TO PREDICT OVERALL MAXIMUM IMPACT

YR MO DY JDY HR

10 01 10 10 01

H0	U*	W*	DT/DZ	ZICNV	ZIMCH	M-O	LEN	Z0	BOWEN	ALBEDO	REF WS
-1.30	0.043	-9.000	0.020	-999.	21.	6.0	1.000	1.50	0.35	0.50	

HT	REF TA	HT
10.0	310.0	2.0

***** AERSCREEN AUTOMATED DISTANCES *****

OVERALL MAXIMUM CONCENTRATIONS BY DISTANCE

DIST (m)	MAXIMUM 1-HR CONC (ug/m3)	DIST (m)	MAXIMUM 1-HR CONC (ug/m3)
1.00	1.803	2525.00	0.2201E-01

25.00	1.969	2550.00	0.2172E-01
50.00	2.128	2575.00	0.2143E-01
75.00	2.245	2600.00	0.2115E-01
100.00	2.280	2625.00	0.2087E-01
125.00	1.453	2650.00	0.2060E-01
150.00	1.074	2675.00	0.2034E-01
175.00	0.8614	2700.00	0.2008E-01
200.00	0.7127	2725.00	0.1983E-01
225.00	0.6039	2750.00	0.1958E-01
250.00	0.5211	2775.00	0.1934E-01
275.00	0.4568	2800.00	0.1911E-01
300.00	0.4045	2825.00	0.1888E-01
325.00	0.3622	2850.00	0.1865E-01
350.00	0.3269	2875.00	0.1843E-01
375.00	0.2975	2900.00	0.1821E-01
400.00	0.2722	2925.00	0.1800E-01
425.00	0.2503	2950.00	0.1779E-01
450.00	0.2315	2975.00	0.1759E-01
475.00	0.2150	3000.00	0.1739E-01
500.00	0.2005	3025.00	0.1719E-01
525.00	0.1875	3050.00	0.1700E-01
550.00	0.1759	3075.00	0.1681E-01
575.00	0.1655	3100.00	0.1662E-01
600.00	0.1562	3125.00	0.1644E-01
625.00	0.1477	3150.00	0.1626E-01
650.00	0.1400	3175.00	0.1609E-01
675.00	0.1329	3200.00	0.1592E-01
700.00	0.1265	3225.00	0.1575E-01
725.00	0.1205	3250.00	0.1558E-01
750.00	0.1151	3275.00	0.1542E-01
775.00	0.1100	3300.00	0.1526E-01
800.00	0.1054	3325.00	0.1510E-01
825.00	0.1011	3350.00	0.1495E-01
850.00	0.9702E-01	3375.00	0.1480E-01
875.00	0.9326E-01	3400.00	0.1465E-01
900.00	0.8974E-01	3425.00	0.1450E-01
925.00	0.8645E-01	3450.00	0.1436E-01
950.00	0.8336E-01	3475.00	0.1422E-01
975.00	0.8044E-01	3500.00	0.1408E-01
1000.00	0.7770E-01	3525.00	0.1394E-01
1025.00	0.7512E-01	3550.00	0.1381E-01
1050.00	0.7268E-01	3575.00	0.1368E-01
1075.00	0.7038E-01	3600.00	0.1355E-01
1100.00	0.6821E-01	3625.00	0.1342E-01
1125.00	0.6614E-01	3650.00	0.1329E-01
1150.00	0.6419E-01	3675.00	0.1317E-01
1175.00	0.6233E-01	3700.00	0.1305E-01
1200.00	0.6057E-01	3725.00	0.1293E-01
1225.00	0.5889E-01	3750.00	0.1281E-01
1250.00	0.5729E-01	3775.00	0.1269E-01

1275.00	0.5576E-01	3800.00	0.1258E-01
1300.00	0.5431E-01	3825.00	0.1247E-01
1325.00	0.5291E-01	3850.00	0.1236E-01
1350.00	0.5158E-01	3875.00	0.1225E-01
1375.00	0.5031E-01	3900.00	0.1214E-01
1400.00	0.4909E-01	3925.00	0.1203E-01
1425.00	0.4793E-01	3950.00	0.1193E-01
1450.00	0.4681E-01	3975.00	0.1183E-01
1475.00	0.4573E-01	4000.00	0.1173E-01
1500.00	0.4470E-01	4025.00	0.1163E-01
1525.00	0.4371E-01	4050.00	0.1153E-01
1550.00	0.4275E-01	4075.00	0.1143E-01
1575.00	0.4183E-01	4100.00	0.1134E-01
1600.00	0.4094E-01	4125.00	0.1124E-01
1625.00	0.4009E-01	4150.00	0.1115E-01
1650.00	0.3926E-01	4175.00	0.1106E-01
1675.00	0.3846E-01	4200.00	0.1097E-01
1700.00	0.3769E-01	4225.00	0.1088E-01
1725.00	0.3694E-01	4250.00	0.1079E-01
1750.00	0.3638E-01	4275.00	0.1071E-01
1775.00	0.3568E-01	4300.00	0.1062E-01
1800.00	0.3500E-01	4325.00	0.1054E-01
1825.00	0.3434E-01	4350.00	0.1046E-01
1850.00	0.3371E-01	4375.00	0.1037E-01
1875.00	0.3309E-01	4400.00	0.1029E-01
1900.00	0.3250E-01	4425.00	0.1021E-01
1925.00	0.3192E-01	4450.00	0.1014E-01
1950.00	0.3136E-01	4475.00	0.1006E-01
1975.00	0.3082E-01	4500.00	0.9982E-02
2000.00	0.3029E-01	4525.00	0.9906E-02
2025.00	0.2978E-01	4550.00	0.9832E-02
2050.00	0.2929E-01	4575.00	0.9758E-02
2075.00	0.2880E-01	4600.00	0.9686E-02
2100.00	0.2833E-01	4625.00	0.9614E-02
2125.00	0.2788E-01	4650.00	0.9544E-02
2150.00	0.2744E-01	4675.00	0.9474E-02
2175.00	0.2700E-01	4700.00	0.9405E-02
2200.00	0.2659E-01	4725.00	0.9337E-02
2225.00	0.2618E-01	4750.00	0.9270E-02
2250.00	0.2578E-01	4775.00	0.9204E-02
2275.00	0.2539E-01	4800.00	0.9138E-02
2300.00	0.2501E-01	4825.00	0.9073E-02
2325.00	0.2465E-01	4850.00	0.9009E-02
2350.00	0.2429E-01	4875.00	0.8946E-02
2375.00	0.2394E-01	4900.00	0.8884E-02
2400.00	0.2360E-01	4924.99	0.8822E-02
2425.00	0.2327E-01	4950.00	0.8761E-02
2450.00	0.2294E-01	4975.00	0.8701E-02
2475.00	0.2262E-01	5000.00	0.8642E-02
2500.00	0.2232E-01		

 ***** AERSCREEN MAXIMUM IMPACT SUMMARY *****

3-hour, 8-hour, and 24-hour scaled
 concentrations are equal to the 1-hour concentration as referenced in
 SCREENING PROCEDURES FOR ESTIMATING THE AIR QUALITY
 IMPACT OF STATIONARY SOURCES, REVISED (Section 4.5.4)
 Report number EPA-454/R-92-019
http://www.epa.gov/scram001/guidance_permit.htm
 under Screening Guidance

CALCULATION PROCEDURE	MAXIMUM 1-HOUR CONC (ug/m3)	SCALED 3-HOUR CONC (ug/m3)	SCALED 8-HOUR CONC (ug/m3)	SCALED 24-HOUR CONC (ug/m3)	SCALED ANNUAL CONC (ug/m3)
FLAT TERRAIN	2.280	2.280	2.280	2.280	N/A
DISTANCE FROM SOURCE	100.00 meters				
IMPACT AT THE AMBIENT BOUNDARY	1.803	1.803	1.803	1.803	N/A
DISTANCE FROM SOURCE	1.00 meters				



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Matthew F. Hagemann, P.G., C.Hg.

- **Geologic and Hydrogeologic Characterization, Investigation and Remediation Strategies**
- **Industrial Stormwater Compliance**
- **CEQA Review**
- **Expert Testimony**

Professional Certifications:

California Professional Geologist, P.G.
California Certified Hydrogeologist, C.Hg.

Education:

M.S. Degree, Geology, California State University Los Angeles, Los Angeles, CA, 1984.
B.A. Degree, Geology, Humboldt State University, Arcata, CA, 1982.

Professional Experience:

30 years of experience in environmental policy, contaminant assessment and remediation, stormwater compliance, and CEQA review. Spent nine years with the U.S. EPA in the Resource Conservation Recovery Act (RCRA) and Superfund programs and served as EPA's Senior Science Policy Advisor in the Western Regional Office where I identified emerging threats to groundwater. While with EPA, I served as a Senior Hydrogeologist in the oversight of the assessment of seven major military facilities undergoing base closure. Led numerous enforcement actions under provisions of the Resource Conservation and Recovery Act (RCRA) and directed efforts to improve hydrogeologic characterization and water quality monitoring. For the past 15 years, as a founding partner with SWAPE, I developed extensive client relationships and has managed complex projects that include consultations as an expert witness and a regulatory specialist, and managing projects ranging from industrial stormwater compliance to CEQA review of impacts from hazardous waste, air quality and greenhouse gas emissions.

Positions held include:

Government:

Senior Science Policy Advisor and Hydrogeologist, U.S. Environmental Protection Agency (1989–1998);

Hydrogeologist, National Park Service, Water Resources Division (1998 – 2000);
Geologist, U.S. Forest Service (1986 – 1998).

Educational:

Geology Instructor, Golden West College, 2010 – 2014, 2017;
Adjunct Faculty Member, San Francisco State University, Department of Geosciences (1993 – 1998);
Instructor, College of Marin, Department of Science (1990 – 1995).

Private Sector:

Founding Partner, Soil/Water/Air Protection Enterprise (SWAPE) (2003 – present);
Senior Environmental Analyst, Komex H2O Science, Inc. (2000 -- 2003);
Executive Director, Orange Coast Watch (2001 – 2004);
Geologist, Dames & Moore (1984 – 1986).

Senior Regulatory and Litigation Support Analyst:

With SWAPE, responsibilities have included:

- Lead analyst and testifying expert, for both plaintiffs and defendants, in the review of over 300 environmental impact reports and negative declarations since 2003 under CEQA that identify significant issues with regard to hazardous waste, water resources, water quality, air quality, greenhouse gas emissions, and geologic hazards.
- Recommending additional mitigation measures to lead agencies at the local and county level to include additional characterization of health risks and implementation of protective measures to reduce exposure to hazards from toxins.
- Stormwater analysis, sampling and best management practice evaluation, for both government agencies and corporate clients, at more than 150 industrial facilities.
- Serving as expert witness for both plaintiffs and defendants in cases including contamination of groundwater, CERCLA compliance in assessment and remediation, and industrial stormwater contamination.
- Technical assistance and litigation support for vapor intrusion concerns, for both government agencies and corporate clients.
- Lead analyst and testifying expert in the review of environmental issues in license applications for large solar power plants before the California Energy Commission.
- Manager of a project to evaluate numerous formerly used military sites in the western U.S.
- Manager of a comprehensive evaluation of potential sources of perchlorate contamination in Southern California drinking water wells.
- Manager and designated expert for litigation support under provisions of Proposition 65 in the review of releases of gasoline to sources drinking water at major refineries and hundreds of gas stations throughout California.

With Komex H2O Science Inc., duties included the following:

- Senior author of a report on the extent of perchlorate contamination that was used in testimony by the former U.S. EPA Administrator and General Counsel.
- Senior researcher in the development of a comprehensive, electronically interactive chronology of MTBE use, research, and regulation.
- Senior researcher in the development of a comprehensive, electronically interactive chronology of perchlorate use, research, and regulation.
- Senior researcher in a study that estimates nationwide costs for MTBE remediation and drinking

water treatment, results of which were published in newspapers nationwide and in testimony against provisions of an energy bill that would limit liability for oil companies.

- Research to support litigation to restore drinking water supplies that have been contaminated by MTBE in California and New York.
- Lead author for a multi-volume remedial investigation report for an operating school in Los Angeles that met strict State of California regulatory requirements.
- Development of strategic approaches for cleanup of contaminated sites in consultation with clients and regulators.

Hydrogeology:

As a Senior Hydrogeologist with the U.S. Environmental Protection Agency, led investigations to characterize and cleanup closing military bases, including Mare Island Naval Shipyard, Hunters Point Naval Shipyard, Treasure Island Naval Station, Alameda Naval Station, Moffett Field, Mather Army Airfield, and Sacramento Army Depot. Specific activities included:

- Leading efforts to model groundwater flow and contaminant transport, ensured adequacy of monitoring networks, and assessed cleanup alternatives for contaminated sediment, soil, and groundwater.
- Initiating a regional program for evaluation of groundwater sampling practices and laboratory analysis at military bases.
- Identifying emerging issues, wrote technical guidance, and assisted in policy and regulation development through work on four national U.S. EPA workgroups, including the Superfund Groundwater Technical Forum and the Federal Facilities Forum.

At the request of the State of Hawaii, developed a methodology to determine the vulnerability of groundwater to contamination on the islands of Maui and Oahu. Used analytical models and a GIS to show zones of vulnerability, and the results were adopted and published by the State of Hawaii and County of Maui.

As a hydrogeologist with the EPA Groundwater Protection Section, worked with provisions of the Safe Drinking Water Act and NEPA to prevent drinking water contamination. Specific activities included the following:

- Received an EPA Bronze Medal for contribution to the development of national guidance for the protection of drinking water.
- Managed the Sole Source Aquifer Program and protected the drinking water of two communities through designation under the Safe Drinking Water Act. Prepared geologic reports, conducted hearings, and responded to public comments from residents who were very concerned about the impact of designation.
- Reviewed a number of Environmental Impact Statements for planned major developments, including large hazardous and solid waste disposal facilities, mine reclamation, and water transfer.

Served as a hydrogeologist with the RCRA Hazardous Waste program. Duties included:

- Supervised the hydrogeologic investigation of hazardous waste sites to determine compliance with Subtitle C requirements.
- Reviewed and wrote "part B" permits for the disposal of hazardous waste.
- Conducted RCRA Corrective Action investigations of waste sites and led inspections that formed the basis for significant enforcement actions that were developed in close coordination with U.S. EPA legal counsel.

- Wrote contract specifications and supervised contractor's investigations of waste sites.

With the National Park Service, directed service-wide investigations of contaminant sources to prevent degradation of water quality, including the following:

- Applied pertinent laws and regulations including CERCLA, RCRA, NEPA, NRDA, and the Clean Water Act to control military, mining, and landfill contaminants.
- Conducted watershed-scale investigations of contaminants at parks, including Yellowstone and Olympic National Park.
- Identified high-levels of perchlorate in soil adjacent to a national park in New Mexico and advised park superintendent on appropriate response actions under CERCLA.
- Served as a Park Service representative on the Interagency Perchlorate Steering Committee, a national workgroup.
- Developed a program to conduct environmental compliance audits of all National Parks while serving on a national workgroup.
- Co-authored two papers on the potential for water contamination from the operation of personal watercraft and snowmobiles, these papers serving as the basis for the development of nation-wide policy on the use of these vehicles in National Parks.
- Contributed to the Federal Multi-Agency Source Water Agreement under the Clean Water Action Plan.

Policy:

Served as senior management as the Senior Science Policy Advisor with the U.S. Environmental Protection Agency, Region 9. Activities included the following:

- Advising the Regional Administrator and senior management on emerging issues such as the potential for the gasoline additive MTBE and ammonium perchlorate to contaminate drinking water supplies.
- Shaping EPA's national response to these threats by serving on workgroups and by contributing to guidance, including the Office of Research and Development publication, Oxygenates in Water: Critical Information and Research Needs.
- Improving the technical training of EPA's scientific and engineering staff.
- Earning an EPA Bronze Medal for representing the region's 300 scientists and engineers in negotiations with the Administrator and senior management to better integrate scientific principles into the policy-making process.
- Establishing national protocol for the peer review of scientific documents.

Geology:

With the U.S. Forest Service, led investigations to determine hillslope stability of areas proposed for timber harvest in the central Oregon Coast Range. Specific activities included:

- Mapping geology in the field, and used aerial photographic interpretation and mathematical models to determine slope stability.
- Coordinating research with community stakeholders who were concerned with natural resource protection.
- Characterizing the geology of an aquifer that serves as the sole source of drinking water for the city of Medford, Oregon.

As a consultant with Dames and Moore, led geologic investigations of two contaminated sites (later listed on the Superfund NPL) in the Portland, Oregon, area and a large RCRA hazardous waste site in eastern Oregon.

Duties included the following:

- Supervising year-long effort for soil and groundwater sampling.
- Conducting aquifer tests.
- Investigating active faults beneath sites proposed for hazardous waste disposal.

Teaching:

From 1990 to 1998, taught at least one course per semester at the community college and university levels:

- At San Francisco State University, held an adjunct faculty position and taught courses in environmental geology, oceanography (lab and lecture), hydrogeology, and groundwater contamination.
- Served as a committee member for graduate and undergraduate students.
- Taught courses in environmental geology and oceanography at the College of Marin.
- Part time geology instructor at Golden West College in Huntington Beach, California from 2010 to 2014 and in 2017.

Summary of Testimony Experience Over Past Four Years

In Re New Jersey Department of Environmental Protection et al. vs. E.I. DuPont de Nemours and Company, in the United States District Court, District of New Jersey, Civil Action No. 1:19-cv-14766-RMB-JBC. Deposition in 2025.

Representing Plaintiffs in matters regarding contamination of groundwater, wastewater, soil, and air with per- and poly-fluoroalkyl substances.

In Re Edmond Asher, et al., vs. RTX Corporation (f/k/a Raytheon Technologies Corporation, et al.) in the County of Huntington Superior Court, Indiana, Cause number 35D01-2006-CT-000338. Deposition in 2024. Representing Plaintiffs in matters regarding contamination of groundwater and soil vapor with trichlorethylene.

In Re Wright vs Consolidated Rail Corporation In the Circuit Court of Cook County, Illinois, Case No: 21L3966. Deposition in 2023, Representing Plaintiff in matters involving groundwater and drinking water contamination of perchloroethylene, trichlorethylene, 1,2-dichloroethane, and carbon tetrachloride.

In Re Behr Dayton Thermal Products LLC In the United States District Court for the Southern District of Ohio Western Division at Dayton, Case No: 08-cv-326. Deposition in 2022. Representing Plaintiff in matters regarding contamination of groundwater and indoor air with perchloroethylene and trichloethelene.

Orange County Water District vs. Sabic Innovative Plastics US, LLC, et al. In the Court of Appeal, Fourth District,

Division 1, California, Case No: D070553. Deposition in 2020. Representing Plaintiff in matters involving compliance with The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA).

Los Angeles Waterkeeper vs. AAA Plating and Inspection, Inc. In the United States District Court for the Central District of California, Case No: No. CV 18-5916 PA (GJSx). Deposition in 2019. Expert witness representing Plaintiff in matters involving contaminated stormwater runoff at an industrial facility in Compton, California.

Californians for Alternatives to Toxics vs. Schneider Dock and Intermodal Facility. In the United States District Court for the Northern District of California, Case No: 3:17-cv-05287-JST. Deposition in 2019. Expert witness representing Plaintiff in matters involving contaminated stormwater runoff at an industrial facility in Eureka, California.

Bells et al. vs. The 3M Company et al. In the United States District Court for the District of Colorado, Case No: 1:16-CV-02531-RBJ. Deposition in 2018. Expert witness representing Plaintiff on matters regarding the general hydrogeological conditions present in an area impacted by per- and poly-fluoroalkyl substances.

Ungar vs. Foundation for Affordable Housing. In the Superior Court, State of California, Los Angeles County, Case No. BC628890 Deposition in 2017. Expert witness representing defendant on matters involving alleged drinking water contamination.

Invited Testimony, Reports, Papers and Presentations:

Hagemann, M.F., 2008. Disclosure of Hazardous Waste Issues under CEQA. Presentation to the Public Environmental Law Conference, Eugene, Oregon.

Hagemann, M.F., 2008. Disclosure of Hazardous Waste Issues under CEQA. Invited presentation to U.S.EPA Region 9, San Francisco, California.

Hagemann, M.F., 2005. Use of Electronic Databases in Environmental Regulation, Policy Making and Public Participation. Brownfields 2005, Denver, Colorado.

Hagemann, M.F., 2004. Perchlorate Contamination of the Colorado River and Impacts to Drinking Water in Nevada and the Southwestern U.S. Presentation to a meeting of the American Groundwater Trust, Las Vegas, NV (served on conference organizing committee).

Hagemann, M.F., 2004. Invited testimony to a California Senate committee hearing on air toxins at schools in Southern California, Los Angeles.

Brown, A., Farrow, J., Gray, A. and **Hagemann, M.**, 2004. An Estimate of Costs to Address MTBE Releases from Underground Storage Tanks and the Resulting Impact to Drinking Water Wells.

Presentation to the Ground Water and Environmental Law Conference, National Groundwater Association.

Hagemann, M.F., 2004. Perchlorate Contamination of the Colorado River and Impacts to Drinking Water in Arizona and the Southwestern U.S. Presentation to a meeting of the American Groundwater Trust, Phoenix, AZ (served on conference organizing committee).

Hagemann, M.F., 2003. Perchlorate Contamination of the Colorado River and Impacts to Drinking Water in the Southwestern U.S. Invited presentation to a special committee meeting of the National Academy of Sciences, Irvine, CA.

Hagemann, M.F., 2003. Perchlorate Contamination of the Colorado River. Invited presentation to a tribal EPA meeting, Pechanga, CA.

Hagemann, M.F., 2003. Perchlorate Contamination of the Colorado River. Invited presentation to a meeting of tribal representatives, Parker, AZ.

Hagemann, M.F., 2003. Impact of Perchlorate on the Colorado River and Associated Drinking Water Supplies. Invited presentation to the Inter-Tribal Meeting, Torres Martinez Tribe.

Hagemann, M.F., 2003. The Emergence of Perchlorate as a Widespread Drinking Water Contaminant. Invited presentation to the U.S. EPA Region 9.

Hagemann, M.F., 2003. A Deductive Approach to the Assessment of Perchlorate Contamination. Invited presentation to the California Assembly Natural Resources Committee.

Hagemann, M.F., 2003. Perchlorate: A Cold War Legacy in Drinking Water. Presentation to a meeting of the National Groundwater Association.

Hagemann, M.F., 2002. From Tank to Tap: A Chronology of MTBE in Groundwater. Presentation to a meeting of the National Groundwater Association.

Hagemann, M.F., 2002. A Chronology of MTBE in Groundwater and an Estimate of Costs to Address Impacts to Groundwater. Presentation to the annual meeting of the Society of Environmental Journalists.

Hagemann, M.F., 2002. An Estimate of the Cost to Address MTBE Contamination in Groundwater (and Who Will Pay). Presentation to a meeting of the National Groundwater Association.

Hagemann, M.F., 2002. An Estimate of Costs to Address MTBE Releases from Underground Storage Tanks and the Resulting Impact to Drinking Water Wells. Presentation to a meeting of the U.S. EPA and State Underground Storage Tank Program managers.

Hagemann, M.F., 2001. From Tank to Tap: A Chronology of MTBE in Groundwater. Unpublished report.

Hagemann, M.F., 2001. Estimated Cleanup Cost for MTBE in Groundwater Used as Drinking Water. Unpublished report.

Hagemann, M.F., 2001. Estimated Costs to Address MTBE Releases from Leaking Underground Storage Tanks.

Unpublished report.

Hagemann, M.F., and VanMouwerik, M., 1999. Potential Water Concerns Related to Snowmobile Usage. Water Resources Division, National Park Service, Technical Report.

VanMouwerik, M. and **Hagemann, M.F.** 1999, Water Quality Concerns Related to Personal Watercraft Usage. Water Resources Division, National Park Service, Technical Report.

Hagemann, M.F., 1999, Is Dilution the Solution to Pollution in National Parks? The George Wright Society Biannual Meeting, Asheville, North Carolina.

Hagemann, M.F., 1997, The Potential for MTBE to Contaminate Groundwater. U.S. EPA Superfund Groundwater Technical Forum Annual Meeting, Las Vegas, Nevada.

Hagemann, M.F., and Gill, M., 1996, Impediments to Intrinsic Remediation, Moffett Field Naval Air Station, Conference on Intrinsic Remediation of Chlorinated Hydrocarbons, Salt Lake City.

Hagemann, M.F., Fukunaga, G.L., 1996, The Vulnerability of Groundwater to Anthropogenic Contaminants on the Island of Maui, Hawaii. Hawaii Water Works Association Annual Meeting, Maui, October 1996.

Hagemann, M. F., Fukunaga, G. L., 1996, Ranking Groundwater Vulnerability in Central Oahu, Hawaii. Proceedings, Geographic Information Systems in Environmental Resources Management, Air and Waste Management Association Publication VIP-61.

Hagemann, M.F., 1994. Groundwater Characterization and Cleanup at Closing Military Bases in California. Proceedings, California Groundwater Resources Association Meeting.

Hagemann, M.F. and Sabol, M.A., 1993. Role of the U.S. EPA in the High Plains States Groundwater Recharge Demonstration Program. Proceedings, Sixth Biennial Symposium on the Artificial Recharge of Groundwater.

Hagemann, M.F., 1993. U.S. EPA Policy on the Technical Impracticability of the Cleanup of DNAPL-contaminated Groundwater. California Groundwater Resources Association Meeting.

Hagemann, M.F., 1992. Dense Nonaqueous Phase Liquid Contamination of Groundwater: An Ounce of Prevention... Proceedings, Association of Engineering Geologists Annual Meeting, v. 35.

Other Experience:

Selected as subject matter expert for the California Professional Geologist licensing examinations, 2009-2011.



Technical Consultation, Data Analysis and
Litigation Support for the Environment

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Paul Rosenfeld, Ph.D.

Principal Environmental Chemist

Chemical Fate and Transport & Air Dispersion Modeling

Risk Assessment & Remediation Specialist

Education

Ph.D. Soil Chemistry, University of Washington, 1999. Dissertation on volatile organic compound filtration.

M.S. Environmental Science, U.C. Berkeley, 1995. Thesis on organic waste economics.

B.A. Environmental Studies, U.C. Santa Barbara, 1991. Focus on wastewater treatment.

Professional Experience

Dr. Rosenfeld has over 25 years of experience conducting environmental investigations and risk assessments for evaluating impacts to human health, property, and ecological receptors. His expertise focuses on the fate and transport of environmental contaminants, human health risk, exposure assessment, and ecological restoration. Dr. Rosenfeld has evaluated and modeled emissions from oil spills, landfills, boilers and incinerators, process stacks, storage tanks, confined animal feeding operations, industrial, military and agricultural sources, unconventional oil drilling operations, and locomotive and construction engines. His project experience ranges from monitoring and modeling of pollution sources to evaluating impacts of pollution on workers at industrial facilities and residents in surrounding communities. Dr. Rosenfeld has also successfully modeled exposure to contaminants distributed by water systems and via vapor intrusion.

Dr. Rosenfeld has investigated and designed remediation programs and risk assessments for contaminated sites containing lead, heavy metals, mold, bacteria, particulate matter, petroleum hydrocarbons, chlorinated solvents, pesticides, radioactive waste, dioxins and furans, semi- and volatile organic compounds, PCBs, PAHs, creosote, perchlorate, asbestos, per- and poly-fluoroalkyl substances (PFOA/PFOS), unusual polymers, fuel oxygenates (MTBE), among other pollutants. Dr. Rosenfeld also has experience evaluating greenhouse gas emissions from various projects and is an expert on the assessment of odors from industrial and agricultural sites, as well as the evaluation of odor nuisance impacts and technologies for abatement of odorous emissions. As a principal scientist at SWAPE, Dr. Rosenfeld directs air dispersion modeling and exposure assessments. He has served as an expert witness and testified about pollution sources causing nuisance and/or personal injury at sites and has testified as an expert witness on numerous cases involving exposure to soil, water and air contaminants from industrial, railroad, agricultural, and military sources.

Professional History:

Soil Water Air Protection Enterprise (SWAPE); 2003 to present; Principal and Founding Partner
UCLA School of Public Health; 2007 to 2011; Lecturer (Assistant Researcher)
UCLA School of Public Health; 2003 to 2006; Adjunct Professor
UCLA Environmental Science and Engineering Program; 2002-2004; Doctoral Intern Coordinator
UCLA Institute of the Environment, 2001-2002; Research Associate
Komex H₂O Science, 2001 to 2003; Senior Remediation Scientist
National Groundwater Association, 2002-2004; Lecturer
San Diego State University, 1999-2001; Adjunct Professor
Anteon Corp., San Diego, 2000-2001; Remediation Project Manager
Ogden (now Amec), San Diego, 2000-2000; Remediation Project Manager
Bechtel, San Diego, California, 1999 – 2000; Risk Assessor
King County, Seattle, 1996 – 1999; Scientist
James River Corp., Washington, 1995-96; Scientist
Big Creek Lumber, Davenport, California, 1995; Scientist
Plumas Corp., California and USFS, Tahoe 1993-1995; Scientist
Peace Corps and World Wildlife Fund, St. Kitts, West Indies, 1991-1993; Scientist

Publications:

Rosenfeld, P.E., Spaeth, K.R., McCarthy, S.J. *et al.* Camp Lejeune Marine Cancer Risk Assessment for Exposure to Contaminated Drinking Water From 1955 to 1987. *Water Air Soil Pollut* **235**, 124 (2024).
<https://doi.org/10.1007/s11270-023-06863-y>.

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Rosenfeld, P. E., M. Suffet. (2007). The Anatomy of Odour Wheels for Odours of Drinking Water, Wastewater, Compost And The Urban Environment. *Water Science & Technology* 55(5), 335-344.

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Rosenfeld, P.E., and Suffet I.H. (2004). Control of Compost Odor Using High Carbon Wood Ash. *Water Science and Technology*. 49(9),171-178.

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Rosenfeld, P.E., and Suffet, I.H. (2004). Understanding Odorants Associated with Compost, Biomass Facilities, and the Land Application of Biosolids. *Water Science and Technology*. 49(9), 193-199.

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Rosenfeld, P.E., and C.L. Henry. (2001). Characterization of odor emissions from three different biosolids. *Water Soil and Air Pollution*. 127(1-4), 173-191.

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Chollack, T. and **P. Rosenfeld**. (1998). Compost Amendment Handbook for Landscaping. Prepared for and distributed by the City of Redmond, Washington State.

Rosenfeld, P. E. (1992). The Mount Liamuiga Crater Trail. *Heritage Magazine of St. Kitts*, 3(2).

Rosenfeld, P. E. (1993). High School Biogas Project to Prevent Deforestation on St. Kitts. *Biomass Users Network*, 7(1).

Rosenfeld, P. E. (1998). Characterization, Quantification, and Control of Odor Emissions from Biosolids Application To Forest Soil. Doctoral Thesis. University of Washington College of Forest Resources.

Rosenfeld, P. E. (1994). Potential Utilization of Small Diameter Trees on Sierra County Public Land. Master's thesis reprinted by the Sierra County Economic Council. Sierra County, California.

Rosenfeld, P. E. (1991). How to Build a Small Rural Anaerobic Digester & Uses Of Biogas In The First And Third World. Bachelor's Thesis. University of California.

Presentations:

Rosenfeld, P.E., "The science for Perfluorinated Chemicals (PFAS): What makes remediation so hard?" Law Seminars International, (May 9-10, 2018) 800 Fifth Avenue, Suite 101 Seattle, WA.

Rosenfeld, P.E., Sutherland, A; Hesse, R.; Zapata, A. (October 3-6, 2013). Air dispersion modeling of volatile organic emissions from multiple natural gas wells in Decatur, TX. *44th Western Regional Meeting, American Chemical Society*. Lecture conducted from Santa Clara, CA.

Sok, H.L.; Waller, C.C.; Feng, L.; Gonzalez, J.; Sutherland, A.J.; Wisdom-Stack, T.; Sahai, R.K.; Hesse, R.C.; **Rosenfeld, P.E.** (June 20-23, 2010). Atrazine: A Persistent Pesticide in Urban Drinking Water. *Urban Environmental Pollution*. Lecture conducted from Boston, MA.

Feng, L.; Gonzalez, J.; Sok, H.L.; Sutherland, A.J.; Waller, C.C.; Wisdom-Stack, T.; Sahai, R.K.; La, M.; Hesse, R.C.; **Rosenfeld, P.E.** (June 20-23, 2010). Bringing Environmental Justice to East St. Louis, Illinois. *Urban Environmental Pollution*. Lecture conducted from Boston, MA.

Rosenfeld, P.E. (April 19-23, 2009). Perfluorooctanoic Acid (PFOA) and Perfluorooctane Sulfonate (PFOS) Contamination in Drinking Water From the Use of Aqueous Film Forming Foams (AFFF) at Airports in the United States. *2009 Ground Water Summit and 2009 Ground Water Protection Council Spring Meeting*, Lecture conducted from Tuscon, AZ.

Rosenfeld, P.E. (April 19-23, 2009). Cost to Filter Atrazine Contamination from Drinking Water in the United States” Contamination in Drinking Water From the Use of Aqueous Film Forming Foams (AFFF) at Airports in the United States. *2009 Ground Water Summit and 2009 Ground Water Protection Council Spring Meeting*. Lecture conducted from Tuscon, AZ.

Wu, C., Tam, L., Clark, J., **Rosenfeld, P.** (20-22 July (2009). Dioxin and furan blood lipid concentrations in populations living near four wood treatment facilities in the United States. Brebbia, C.A. and Popov, V., eds., *Air Pollution XVII: Proceedings of the Seventeenth International Conference on Modeling, Monitoring and Management of Air Pollution*. Lecture conducted from Tallinn, Estonia.

Rosenfeld, P. E. (October 15-18, 2007). Moss Point Community Exposure To Contaminants From A Releasing Facility. *The 23rd Annual International Conferences on Soils Sediment and Water*. Platform lecture conducted at University of Massachusetts, Amherst MA.

Rosenfeld, P. E. (October 15-18, 2007). The Repeated Trespass of Tritium-Contaminated Water Into A Surrounding Community Form Repeated Waste Spills From A Nuclear Power Plant. *The 23rd Annual International Conferences on Soils Sediment and Water*. Platform lecture conducted from University of Massachusetts, Amherst MA.

Rosenfeld, P. E. (October 15-18, 2007). Somerville Community Exposure To Contaminants From Wood Treatment Facility Emissions. *The 23rd Annual International Conferences on Soils Sediment and Water*. Lecture conducted from University of Massachusetts, Amherst MA.

Rosenfeld P. E. (March 2007). Production, Chemical Properties, Toxicology, & Treatment Case Studies of 1,2,3-Trichloropropane (TCP). *The Association for Environmental Health and Sciences (AEHS) Annual Meeting*. Lecture conducted from San Diego, CA.

Rosenfeld P. E. (March 2007). Blood and Attic Sampling for Dioxin/Furan, PAH, and Metal Exposure in Florala, Alabama. *The AEHS Annual Meeting*. Lecture conducted from San Diego, CA.

Hensley A.R., Scott, A., **Rosenfeld P.E.**, Clark, J.J.J. (August 21 – 25, 2006). Dioxin Containing Attic Dust And Human Blood Samples Collected Near A Former Wood Treatment Facility. *The 26th International Symposium on Halogenated Persistent Organic Pollutants – DIOXIN2006*. Lecture conducted from Radisson SAS Scandinavia Hotel in Oslo Norway.

Hensley A.R., Scott, A., **Rosenfeld P.E.**, Clark, J.J.J. (November 4-8, 2006). Dioxin Containing Attic Dust And Human Blood Samples Collected Near A Former Wood Treatment Facility. *APHA 134 Annual Meeting & Exposition*. Lecture conducted from Boston Massachusetts.

Paul Rosenfeld Ph.D. (October 24-25, 2005). Fate, Transport and Persistence of PFOA and Related Chemicals. Mealey’s C8/PFOA. *Science, Risk & Litigation Conference*. Lecture conducted from The Rittenhouse Hotel, Philadelphia, PA.

Paul Rosenfeld Ph.D. (September 19, 2005). Brominated Flame Retardants in Groundwater: Pathways to Human Ingestion, *Toxicology and Remediation PEMA Emerging Contaminant Conference*. Lecture conducted from Hilton Hotel, Irvine California.

Paul Rosenfeld Ph.D. (September 19, 2005). Fate, Transport, Toxicity, And Persistence of 1,2,3-TCP. *PEMA Emerging Contaminant Conference*. Lecture conducted from Hilton Hotel in Irvine, California.

Paul Rosenfeld Ph.D. (September 26-27, 2005). Fate, Transport and Persistence of PDBEs. *Mealey’s Groundwater Conference*. Lecture conducted from Ritz Carlton Hotel, Marina Del Ray, California.

Paul Rosenfeld Ph.D. (June 7-8, 2005). Fate, Transport and Persistence of PFOA and Related Chemicals. *International Society of Environmental Forensics: Focus on Emerging Contaminants*. Lecture conducted from Sheraton Oceanfront Hotel, Virginia Beach, Virginia.

Paul Rosenfeld Ph.D. (July 21-22, 2005). Fate Transport, Persistence and Toxicology of PFOA and Related Perfluorochemicals. *2005 National Groundwater Association Ground Water and Environmental Law Conference*. Lecture conducted from Wyndham Baltimore Inner Harbor, Baltimore Maryland.

Paul Rosenfeld Ph.D. (July 21-22, 2005). Brominated Flame Retardants in Groundwater: Pathways to Human Ingestion, Toxicology and Remediation. *2005 National Groundwater Association Ground Water and Environmental Law Conference*. Lecture conducted from Wyndham Baltimore Inner Harbor, Baltimore Maryland.

Paul Rosenfeld, Ph.D. and James Clark Ph.D. and Rob Hesse R.G. (May 5-6, 2004). Tert-butyl Alcohol Liability and Toxicology, A National Problem and Unquantified Liability. *National Groundwater Association. Environmental Law Conference*. Lecture conducted from Congress Plaza Hotel, Chicago Illinois.

Paul Rosenfeld, Ph.D. (March 2004). Perchlorate Toxicology. *Meeting of the American Groundwater Trust*. Lecture conducted from Phoenix Arizona.

Hagemann, M.F., **Paul Rosenfeld, Ph.D.** and Rob Hesse (2004). Perchlorate Contamination of the Colorado River. *Meeting of tribal representatives*. Lecture conducted from Parker, AZ.

Paul Rosenfeld, Ph.D. (April 7, 2004). A National Damage Assessment Model for PCE and Dry Cleaners. *Drycleaner Symposium. California Ground Water Association*. Lecture conducted from Radison Hotel, Sacramento, California.

Rosenfeld, P. E., Grey, M., (June 2003) Two stage biofilter for biosolids composting odor control. *Seventh International In Situ And On Site Bioremediation Symposium Battelle Conference* Orlando, FL.

Paul Rosenfeld, Ph.D. and James Clark Ph.D. (February 20-21, 2003) Understanding Historical Use, Chemical Properties, Toxicity and Regulatory Guidance of 1,4 Dioxane. *National Groundwater Association. Southwest Focus Conference. Water Supply and Emerging Contaminants*. Lecture conducted from Hyatt Regency Phoenix Arizona.

Paul Rosenfeld, Ph.D. (February 6-7, 2003). Underground Storage Tank Litigation and Remediation. *California CUPA Forum*. Lecture conducted from Marriott Hotel, Anaheim California.

Paul Rosenfeld, Ph.D. (October 23, 2002) Underground Storage Tank Litigation and Remediation. *EPA Underground Storage Tank Roundtable*. Lecture conducted from Sacramento California.

Rosenfeld, P.E. and Suffet, M. (October 7- 10, 2002). Understanding Odor from Compost, *Wastewater and Industrial Processes. Sixth Annual Symposium on Off Flavors in the Aquatic Environment. International Water Association*. Lecture conducted from Barcelona Spain.

Rosenfeld, P.E. and Suffet, M. (October 7- 10, 2002). Using High Carbon Wood Ash to Control Compost Odor. *Sixth Annual Symposium on Off Flavors in the Aquatic Environment. International Water Association*. Lecture conducted from Barcelona Spain.

Rosenfeld, P.E. and Grey, M. A. (September 22-24, 2002). Biocycle Composting for Coastal Sage Restoration. *Northwest Biosolids Management Association*. Lecture conducted from Vancouver Washington.

Rosenfeld, P.E. and Grey, M. A. (November 11-14, 2002). Using High-Carbon Wood Ash to Control Odor at a Green Materials Composting Facility. *Soil Science Society Annual Conference*. Lecture conducted from Indianapolis, Maryland.

Rosenfeld, P.E. (September 16, 2000). Two stage biofilter for biosolids composting odor control. *Water Environment Federation*. Lecture conducted from Anaheim California.

Rosenfeld, P.E. (October 16, 2000). Wood ash and biofilter control of compost odor. *Biofest*. Lecture conducted from Ocean Shores, California.

Rosenfeld, P.E. (2000). Bioremediation Using Organic Soil Amendments. *California Resource Recovery Association*. Lecture conducted from Sacramento California.

Rosenfeld, P.E., C.L. Henry, R. Harrison. (1998). Oat and Grass Seed Germination and Nitrogen and Sulfur Emissions Following Biosolids Incorporation with High-Carbon Wood-Ash. *Water Environment Federation 12th Annual Residuals and Biosolids Management Conference Proceedings*. Lecture conducted from Bellevue Washington.

Rosenfeld, P.E., and C.L. Henry. (1999). An evaluation of ash incorporation with biosolids for odor reduction. *Soil Science Society of America*. Lecture conducted from Salt Lake City Utah.

Rosenfeld, P.E., C.L. Henry, R. Harrison. (1998). Comparison of Microbial Activity and Odor Emissions from Three Different Biosolids Applied to Forest Soil. *Brown and Caldwell*. Lecture conducted from Seattle Washington.

Rosenfeld, P.E., C.L. Henry. (1998). Characterization, Quantification, and Control of Odor Emissions from Biosolids Application To Forest Soil. *Biofest*. Lecture conducted from Lake Chelan, Washington.

Rosenfeld, P.E., C.L. Henry, R. Harrison. (1998). Oat and Grass Seed Germination and Nitrogen and Sulfur Emissions Following Biosolids Incorporation with High-Carbon Wood-Ash. *Water Environment Federation 12th Annual Residuals and Biosolids Management Conference Proceedings*. Lecture conducted from Bellevue Washington.

Rosenfeld, P.E., C.L. Henry, R. B. Harrison, and R. Dills. (1997). Comparison of Odor Emissions from Three Different Biosolids Applied to Forest Soil. *Soil Science Society of America*. Lecture conducted from Anaheim California.

Teaching Experience:

UCLA Department of Environmental Health (Summer 2003 through 20010) Taught Environmental Health Science 100 to students, including undergrad, medical doctors, public health professionals and nurses. The course focused on the health effects of environmental contaminants.

National Ground Water Association, Successful Remediation Technologies. Custom Course in Sante Fe, New Mexico. May 21, 2002. Focused on fate and transport of fuel contaminants associated with underground storage tanks.

National Ground Water Association; Successful Remediation Technologies Course in Chicago Illinois. April 1, 2002. Focused on fate and transport of contaminants associated with Superfund and RCRA sites.

California Integrated Waste Management Board, April and May 2001. Alternative Landfill Caps Seminar in San Diego, Ventura, and San Francisco. Focused on both prescriptive and innovative landfill cover design.

UCLA Department of Environmental Engineering, February 5, 2002. Seminar on Successful Remediation Technologies focusing on Groundwater Remediation.

University Of Washington, Soil Science Program, Teaching Assistant for several courses including Soil Chemistry, Organic Soil Amendments, and Soil Stability.

U.C. Berkeley, Environmental Science Program Teaching Assistant for Environmental Science 10.

Academic Grants Awarded:

California Integrated Waste Management Board. \$41,000 grant awarded to UCLA Institute of the Environment. Goal: To investigate the effect of high carbon wood ash on volatile organic emissions from compost. 2001.

Synagro Technologies, Corona California: \$10,000 grant awarded to San Diego State University.
Goal: investigate the effect of biosolids for restoration and remediation of degraded coastal sage soils. 2000.

King County, Department of Research and Technology, Washington State. \$100,000 grant awarded to University of Washington: Goal: To investigate odor emissions from biosolids application and the effect of polymers and ash on VOC emissions. 1998.

Northwest Biosolids Management Association, Washington State. \$20,000 grant awarded to investigate the effect of polymers and ash on VOC emissions from biosolids. 1997.

James River Corporation, Oregon: \$10,000 grant was awarded to investigate the success of genetically engineered Poplar trees with resistance to round-up. 1996.

United State Forest Service, Tahoe National Forest: \$15,000 grant was awarded to investigating fire ecology of the Tahoe National Forest. 1995.

Kellogg Foundation, Washington D.C. \$500 grant was awarded to construct a large anaerobic digester on St. Kitts in West Indies. 1993

Deposition and/or Trial Testimony:

In the District Court of Harris County Texas
Mt Davis Interest, Inc v Sesco Cement Corp
Cause No 2023-26512
Trial 6-6-25

In the United States Southern District of New York
Gallo vs Avon Products Inc., et al
Civil Action No.: 1:23-cv-2023
Deposition 4-24-2025

In Vanderburgh Superior Court 5, County of Vanderburgh, Indiana
Markello v CSX
Civil Action No 82D05-2011-CT-004962
Deposition 3-26-25

In the Circuit Court of Cook County Illinois
Jarosiewicz v Northeast Regional Railroad
Case No 2023 L 002290
Deposition 2-27-25

In the District Court 191st Judicial District Dallas County
Acklin v Poly America International
Cause No DC-22-08610
Deposition 1-8-2025

United States District Court, Norther District of California
Asustin Vs Monsanto
Case No 2:23-cv-272
Deposition 12-20-25

In Jefferson Circuit Court Division One, Louisville, Kentucky
Stafford vs, CSX
Case No. 18-CI-001790

Deposition: 8-27-24

In the Twenty-Second Judicial Circuit of St. Louis. State of Missouri
Patricia Godfrey vs. Amtrak
Case No. 2122-CC-00525
Deposition: 7-17-24

In the Circuit Court of Jefferson County Alabama
Linda Early Vs. CSX
Case number CV-2021-00241
Deposition 6-24-24

In the Court of Common Pleas Lucas County, Ohio
Brenda Conkright vs. CSX
Case No. G-4801-CI-0202102664-000
Deposition: 6-4-24

In the Commonwealth of Kentucky, Greenup Circuit Court
Patsy Sue Napier vs. CSX
Case No. 19-CI-0012
Deposition: 5-8-2-24

In United States District Court of Hawaii
Patrick Feindt, Jr. et al. vs. The United States of America
Case No. 1:22-cv-LEK-KJM
Trial 3-29-24 and 4-5-24

In the District Court of Hood County State of Texas
Artie Gray vs. Exxon Mobil
Case No. C-2018047
Rosenfeld Deposition:4-22-2024

In the Elkhart Superior Court State of Indiana
Estate of Clark Stacy vs. Penn Central Corporation
Cause No 2D01-2001-CT-00007
Rosenfeld Deposition 1-25-2024 and 3-7-2024

In the Circuit Court of Trempealeau County, State of Wisconsin
Michael J. Sylla et al. vs. High-Crush Whitehall LLC
Case No. 2019-CV-63, 2019-CV-64, 2019-CV-65, 2019-CV-66
Rosenfeld Deposition: 3-5-2024

In the Circuit Court of Trempealeau County, State of Wisconsin
Leland Drangstveit vs. High-Crush Blair LLC
Case No. 19-CV-66
Rosenfeld Deposition 3-5-2024

In the Circuit Court of Jefferson County Alabama
Donald Lee Ashworth vs. CSX Transportation Inc.
Case No CV-2021-901261
Rosenfeld Deposition 1-23-2024

In the United States District Court for the Eastern District of Wisconsin
Gary L Siepe vs. Soo Line Railroad
Case No. 2:21-cv-00919
Rosenfeld Deposition 1-19-2024

In the United States District Court for the Western District of Louisiana
Ricky Bush v. Clean Harbors Colfax LLC
Case No. 1:22-cv-02026-DDD-JPM
Rosenfeld Deposition 12-18-2023 and 1-15-2024

In United States District Court of Hawaii
Patrick Feindt, Jr. et al. vs. The United States of America
Case No. 1:22-cv-LEK-KJM
Rosenfeld Deposition 11-29-2023

In the Circuit Court for the Twentieth Judicial Circuit St. Clair County, Illinois
Timothy Gray vs. Rural King et al.
Case No 2022-LA-355
Rosenfeld Deposition 9-26-2023

In United States District Court Eastern District of Wisconsin
Gary L. Siepe vs. Soo Line Railroad Company
Case No. 2:21-cv-00919
Rosenfeld Deposition 9-15-2023

In the Circuit Court of Cook County Illinois
Donald Fox vs. BNSF
Case No. 2021 L12
Rosenfeld Deposition 9-12-2023

In the Court of Common Pleas Cuyahoga County, Ohio
Thomas Schleich vs. Penn Central Corporation
Lead Case No. CV-20-939184
Rosenfeld Deposition 8-27-2023

In the Circuit Court of Jackson County Missouri at Kansas City
Timothy Dalsing vs. BNSF
Case No. No. 2216-cv06539
Rosenfeld Deposition 7-28-2023

In the United States District Court for the Southern District of Texas Houston Division
International Terminals Company LLC Deer Park Fire Litigation
Lead Case No. 4:19-cv-01460
Rosenfeld Deposition 7-25-2023

In the Circuit Court of Livingston County Missouri
Shirley Ralls vs. Canadian Pacific Railway and Soo Lind Railroad
Case No. 28LV-CV0020
Rosenfeld Daubert Hearing 7-18-2023 Trial Testimony 7-19-2023

In the Circuit Court of Cook County Illinois
Brenda Wright vs. Penn Central and Conrail
Case No. No. 2032L003966
Rosenfeld Deposition 6-13-2023

In the Circuit Court Common Pleas Philadelphia of Jefferson County Alabama
Frank Belle vs. Birmingham Southern Railroad Company et al.
Case No. 01-cv-2021-900901.00
Rosenfeld Deposition 4-6-2023

In the Circuit Court of Jefferson County Alabama
Linda De Gregorio vs. Penn Central
Case No. 002278
Rosenfeld Deposition 3-27-20203

In the United States District Court Eastern District of New York
Rosalie Romano et al. vs. Northrup Grumman Corporation
Case No. 16-cv-5760
Rosenfeld Deposition 3-16-2023

In the Superior Court of Washington, Spokane County
Judy Cundy vs. BNSF
Case No. 21-2-03718-32
Rosenfeld Deposition 3-9-2023

In The Court of Common Pleas of Philadelphia County, PA Civil Trial Division
Feaster v Conrail
Case No. 001075
Rosenfeld Deposition 2-1-2023

In United States District Court for the Central District of Illinois
Sherman vs. BNSF
Case No. 3:17-cv-01192
Rosenfeld Deposition 1-18-2023

In United States District Court District of Colorado
Gonzales vs. BNSF
Case No. 1:21-cv-01690
Rosenfeld Deposition 1-17-2023

In United States District Court District of Colorado
Abeyta vs. BNSF
Case No. 1:21-cv-01689-KMT
Rosenfeld Deposition 1-3-2023

In United States District Court For The Easter District of Louisiana
Nathaniel Smith vs. Illinois Central Railroad
Case No. 2:21-cv-01235
Rosenfeld Deposition 11-30-2022

In the Superior Court of the State of California, County of San Bernardino
Billy Wildrick, Plaintiff vs. BNSF Railway Company
Case No. CIVDS1711810
Rosenfeld Deposition 10-17-2022

In the State Court of Bibb County, State of Georgia
Richard Hutcherson, Plaintiff vs Norfolk Southern Railway Company
Case No. 10-SCCV-092007
Rosenfeld Deposition 10-6-2022

In the Civil District Court of the Parish of Orleans, State of Louisiana
Millard Clark, Plaintiff vs. Dixie Carriers, Inc. et al.
Case No. 2020-03891
Rosenfeld Deposition 9-15-2022

In The Circuit Court of Livingston County, State of Missouri, Circuit Civil Division

Shirley Ralls, Plaintiff vs. Canadian Pacific Railway and Soo Line Railroad
Case No. 18-LV-CC0020
Rosenfeld Deposition 9-7-2022

In The Circuit Court of the 13th Judicial Circuit Court, Hillsborough County, Florida Civil Division
Jonny C. Daniels, Plaintiff vs. CSX Transportation Inc.
Case No. 20-CA-5502
Rosenfeld Deposition 9-1-2022

In The Circuit Court of St. Louis County, State of Missouri
Kieth Luke et. al. Plaintiff vs. Monsanto Company et. al.
Case No. 19SL-CC03191
Rosenfeld Deposition 8-25-2022

In The Circuit Court of the 13th Judicial Circuit Court, Hillsborough County, Florida Civil Division
Jeffery S. Lamotte, Plaintiff vs. CSX Transportation Inc.
Case No. NO. 20-CA-0049
Rosenfeld Deposition 8-22-2022

In State of Minnesota District Court, County of St. Louis Sixth Judicial District
Greg Bean, Plaintiff vs. Soo Line Railroad Company
Case No. 69-DU-CV-21-760
Rosenfeld Deposition 8-17-2022

In United States District Court Western District of Washington at Tacoma, Washington
John D. Fitzgerald Plaintiff vs. BNSF
Case No. 3:21-cv-05288-RJB
Rosenfeld Deposition 8-11-2022

In Circuit Court of the Sixth Judicial Circuit, Macon Illinois
Rocky Bennyhoff Plaintiff vs. Norfolk Southern
Case No. 20-L-56
Rosenfeld Deposition 8-3-2022, Trial 1-10-2023

In Court of Common Pleas, Hamilton County Ohio
Joe Briggins Plaintiff vs. CSX
Case No. A2004464
Rosenfeld Deposition 6-17-2022

In the Superior Court of the State of California, County of Kern
George LaFazia vs. BNSF Railway Company.
Case No. BCV-19-103087
Rosenfeld Deposition 5-17-2022

In the Circuit Court of Cook County Illinois
Bobby Earles vs. Penn Central et. al.
Case No. 2020-L-000550
Rosenfeld Deposition 4-16-2022

In United States District Court Easter District of Florida
Albert Hartman Plaintiff vs. Illinois Central
Case No. 2:20-cv-1633
Rosenfeld Deposition 4-4-2022

In the Circuit Court of the 4th Judicial Circuit, in and For Duval County, Florida
Barbara Steele vs. CSX Transportation

Case No.16-219-Ca-008796
Rosenfeld Deposition 3-15-2022

In United States District Court Easter District of New York
Romano et al. vs. Northrup Grumman Corporation
Case No. 16-cv-5760
Rosenfeld Deposition 3-10-2022

In the Circuit Court of Cook County Illinois
Linda Benjamin vs. Illinois Central
Case No. No. 2019 L 007599
Rosenfeld Deposition 1-26-2022

In the Circuit Court of Cook County Illinois
Donald Smith vs. Illinois Central
Case No. No. 2019 L 003426
Rosenfeld Deposition 1-24-2022

In the Circuit Court of Cook County Illinois
Jan Holeman vs. BNSF
Case No. 2019 L 000675
Rosenfeld Deposition 1-18-2022

In the State Court of Bibb County State of Georgia
Dwayne B. Garrett vs. Norfolk Southern
Case No. 20-SCCV-091232
Rosenfeld Deposition 11-10-2021

In the Circuit Court of Cook County Illinois
Joseph Ruepke vs. BNSF
Case No. 2019 L 007730
Rosenfeld Deposition 11-5-2021

In the United States District Court For the District of Nebraska
Steven Gillett vs. BNSF
Case No. 4:20-cv-03120
Rosenfeld Deposition 10-28-2021

In the Montana Thirteenth District Court of Yellowstone County
James Eadus vs. Soo Line Railroad and BNSF
Case No. DV 19-1056
Rosenfeld Deposition 10-21-2021

In the Circuit Court Of The Twentieth Judicial Circuit, St Clair County, Illinois
Martha Custer et al. vs Cerro Flow Products, Inc.
Case No. 0i9-L-2295
Rosenfeld Deposition 5-14-2021
Trial October 8-4-2021

In the Circuit Court of Cook County Illinois
Joseph Rafferty vs. Consolidated Rail Corporation and National Railroad Passenger Corporation d/b/a
AMTRAK,
Case No. 18-L-6845
Rosenfeld Deposition 6-28-2021

In the United States District Court For the Northern District of Illinois

Theresa Romcoe vs. Northeast Illinois Regional Commuter Railroad Corporation d/b/a METRA Rail
Case No. 17-cv-8517
Rosenfeld Deposition 5-25-2021

In the Superior Court of the State of Arizona In and For the County of Maricopa
Mary Tryon et al. vs. The City of Phoenix v. Cox Cactus Farm, L.L.C., Utah Shelter Systems, Inc.
Case No. CV20127-094749
Rosenfeld Deposition 5-7-2021

In the United States District Court for the Eastern District of Texas Beaumont Division
Robinson, Jeremy et al vs. CNA Insurance Company et al.
Case No. 1:17-cv-000508
Rosenfeld Deposition 3-25-2021

In the Superior Court of the State of California, County of San Bernardino
Gary Garner, Personal Representative for the Estate of Melvin Garner vs. BNSF Railway Company.
Case No. 1720288
Rosenfeld Deposition 2-23-2021

In the Superior Court of the State of California, County of Los Angeles, Spring Street Courthouse
Benny M Rodriguez vs. Union Pacific Railroad, A Corporation, et al.
Case No. 18STCV01162
Rosenfeld Deposition 12-23-2020

In the Circuit Court of Jackson County, Missouri
Karen Cornwell, Plaintiff, vs. Marathon Petroleum, LP, Defendant.
Case No. 1716-CV10006
Rosenfeld Deposition 8-30-2019

In the United States District Court For The District of New Jersey
Duarte et al, Plaintiffs, vs. United States Metals Refining Company et. al. Defendant.
Case No. 2:17-cv-01624-ES-SCM
Rosenfeld Deposition 6-7-2019

In the United States District Court of Southern District of Texas Galveston Division
M/T Carla Maersk vs. Conti 168., Schiffahrts-GMBH & Co. Bulker KG MS “Conti Perdido” Defendant.
Case No. 3:15-CV-00106 consolidated with 3:15-CV-00237
Rosenfeld Deposition 5-9-2019

In The Superior Court of the State of California In And For The County Of Los Angeles – Santa Monica
Carole-Taddeo-Bates et al., vs. Ifran Khan et al., Defendants
Case No. BC615636
Rosenfeld Deposition 1-26-2019

In The Superior Court of the State of California In And For The County Of Los Angeles – Santa Monica
The San Gabriel Valley Council of Governments et al. vs El Adobe Apts. Inc. et al., Defendants
Case No. BC646857
Rosenfeld Deposition 10-6-2018; Trial 3-7-19

In United States District Court For The District of Colorado
Bells et al. Plaintiffs vs. The 3M Company et al., Defendants
Case No. 1:16-cv-02531-RBJ
Rosenfeld Deposition 3-15-2018 and 4-3-2018

In The District Court Of Regan County, Texas, 112th Judicial District
Phillip Bales et al., Plaintiff vs. Dow Agrosiences, LLC, et al., Defendants

Cause No. 1923
Rosenfeld Deposition 11-17-2017

In The Superior Court of the State of California In And For The County Of Contra Costa
Simons et al., Plaintiffs vs. Chevron Corporation, et al., Defendants
Cause No. C12-01481
Rosenfeld Deposition 11-20-2017

In The Circuit Court of The Twentieth Judicial Circuit, St Clair County, Illinois
Martha Custer et al., Plaintiff vs. Cerro Flow Products, Inc., Defendants
Case No.: No. 0i9-L-2295
Rosenfeld Deposition 8-23-2017

In United States District Court For The Southern District of Mississippi
Guy Manuel vs. The BP Exploration et al., Defendants
Case No. 1:19-cv-00315-RHW
Rosenfeld Deposition 4-22-2020

In The Superior Court of the State of California, For The County of Los Angeles
Warrn Gilbert and Penny Gilber, Plaintiff vs. BMW of North America LLC
Case No. LC102019 (c/w BC582154)
Rosenfeld Deposition 8-16-2017, Trail 8-28-2018

In the Northern District Court of Mississippi, Greenville Division
Brenda J. Cooper, et al., Plaintiffs, vs. Meritor Inc., et al., Defendants
Case No. 4:16-cv-52-DMB-JVM
Rosenfeld Deposition July 2017

In The Superior Court of the State of Washington, County of Snohomish
Michael Davis and Julie Davis et al., Plaintiff vs. Cedar Grove Composting Inc., Defendants
Case No. 13-2-03987-5
Rosenfeld Deposition, February 2017
Trial March 2017

In The Superior Court of the State of California, County of Alameda
Charles Spain., Plaintiff vs. Thermo Fisher Scientific, et al., Defendants
Case No. RG14711115
Rosenfeld Deposition September 2015

In The Iowa District Court In And For Poweshiek County
Russell D. Winburn, et al., Plaintiffs vs. Doug Hoksbergen, et al., Defendants
Case No. LALA002187
Rosenfeld Deposition August 2015

In The Circuit Court of Ohio County, West Virginia
Robert Andrews, et al. vs. Antero, et al.
Civil Action No. 14-C-30000
Rosenfeld Deposition June 2015

In The Iowa District Court for Muscatine County
Laurie Freeman et. al. Plaintiffs vs. Grain Processing Corporation, Defendant
Case No. 4980
Rosenfeld Deposition May 2015

In the Circuit Court of the 17th Judicial Circuit, in and For Broward County, Florida
Walter Hinton, et. al. Plaintiff, vs. City of Fort Lauderdale, Florida, a Municipality, Defendant.

Case No. CACE07030358 (26)
Rosenfeld Deposition December 2014

In the United States District Court Western District of Oklahoma
Tommy McCarty, et al., Plaintiffs, vs. Oklahoma City Landfill, LLC d/b/a Southeast Oklahoma City
Landfill, et al. Defendants.
Case No. 5:12-cv-01152-C
Rosenfeld Deposition: July 2014

In the County Court of Dallas County Texas
Lisa Parr et al, *Plaintiff*, vs. Aruba et al, *Defendant*.
Case Number cc-11-01650-E
Rosenfeld Deposition: March and September 2013
Rosenfeld Trial: April 2014

In the County of Kern, Unlimited Jurisdiction
Rose Propagation Services vs. Heppe Enterprises
Case No. S-1500-CV-278190, LHB
Rosenfeld Deposition: May 2014

In the Circuit Court of Baltimore County Maryland
Philip E. Cvach, II et al., *Plaintiffs* vs. Two Farms, Inc. d/b/a Royal Farms, Defendants
Case Number: 03-C-12-012487 OT
Rosenfeld Deposition: September 2013

In the Court of Galveston County, Texas 56th Judicial District
MDL Litigation Regarding Texas City Refinery Ultracracker Emission Event Litigation
Cause No. 10-UC-0001
Rosenfeld Deposition: March 2013
Rosenfeld Trial: September 2013

In the United States District Court of Southern District of Texas Galveston Division
Kyle Cannon, Eugene Donovan, Genaro Ramirez, Carol Sassler, and Harvey Walton, each Individually and
on behalf of those similarly situated, *Plaintiffs*, vs. BP Products North America, Inc., *Defendant*.
Case 3:10-cv-00622
Rosenfeld Deposition: February 2012
Rosenfeld Trial: April 2013

In the United States District court of Southern District of California
United States of America, Plaintiff vs. 2,560 Acres of Land, more or less, located in Imperial County, State
of California; and Donald L. Crawford, et. al.
Civil No. 3:11-cv-02258-IEG-RBB
Rosenfeld Deposition: December 2012, January 2013

In the Court of Common Pleas of Tuscarawas County Ohio
John Michael Abicht, et al., Plaintiffs, vs. Republic Services, Inc., et al., Defendants
Case No. 2008 CT 10 0741 (Cons. w/ 2009 CV 10 0987)
Rosenfeld Deposition October 2012

In the Court of Common Pleas of Tuscarawas County Ohio
John Michael Abicht, et al., *Plaintiffs*, vs. Republic Services, Inc., et al., *Defendants*
Case Number: 2008 CT 10 0741 (Cons. w/ 2009 CV 10 0987)
Rosenfeld Deposition: October 2012

In the United States District Court for the Middle District of Alabama, Northern Division
James K. Benefield, et al., Plaintiffs, vs. International Paper Company, Defendant.

Civil Action No. 2:09-cv-232-WHA-TFM
Rosenfeld Deposition July 2010, June 2011

EXHIBIT B



INDOOR ENVIRONMENTAL ENGINEERING



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Subject: Indoor Air Quality: AVA Pacific Beach Project–San Diego, CA
(IEE File Reference: P-4892)

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 San Diego County Air Pollution Control District (SDAPCD, 2021).

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 OEHHA 10 in a million-cancer risk threshold (OEHHA, 2017a).

According to the Final Environmental Impact Report. – AVA Pacific Beach Project, San Diego (City of San Diego, 2025), the Project consists of residential building 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 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 ensure 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 ensure 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 are 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. µg/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 (µg/m³) from Equation 1 by dividing the total formaldehyde emission rates (i.e. µg/h) as determined in Step 4, by the design minimum outdoor air ventilation rate (m³/h) for the IAQ Zone.

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

where:

C_{in} = indoor formaldehyde concentration (µg/m³)

E_{total} = total formaldehyde emission rate (µg/h) into the IAQ Zone.

Q_{oa} = design minimum outdoor air ventilation rate to the IAQ Zone (m³/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 Final Environmental Impact Report. – AVA Pacific Beach Project, San Diego (City of San Diego, 2025) the Project is located close to roads with moderate to high traffic including Pacific Beach Avenue, Jewell Street, Fortuna Avenue, La Playa Avenue, Ingraham Street, etc.

According to the Final Environmental Impact Report. – AVA Pacific Beach Project, San Diego (City of San Diego, 2025), the only acoustic study of the Project ambient noise levels consisted of just four (4) short-term (10 minute) measurements conducted on March 29, 2023. 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 minimum of 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 required. 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 Final Environmental Impact Report. – AVA Pacific Beach Project, San Diego (City of San Diego, 2025) the Project is located in the San Diego Air 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 higher) 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 ensure 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 ensure that the OEHHA cancer risk of 10 per million is met (see Appendix A).

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 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,

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 ensure 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 ensure 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 ensure 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.

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Work Experience

Mr. Offermann PE, CIH, has 36 years experience as an IAQ researcher, technical author, and workshop instructor. He is president of Indoor Environmental Engineering, a San Francisco based IAQ R&D consulting firm. As president of Indoor Environmental Engineering, Mr. Offermann directs an interdisciplinary team of environmental scientists, chemists, and mechanical engineers in indoor air quality building investigations. Under Mr. Offermann's supervision, IEE has developed both pro-active and reactive IAQ measurement methods and diagnostic protocols. He has supervised over 2,000 IAQ investigations in commercial, residential, and institutional buildings and conducted numerous forensic investigations related to IAQ.

Litigation Experience

Mr. Offermann has been qualified numerous times in court as an expert in the field of indoor air quality and ventilation for both plaintiffs and defendants. He has been deposed over 150 times in cases involving indoor air quality/ventilation issues in commercial, residential, and institutional buildings involving construction defects, and/or operation and maintenance problems. Examples of indoor air quality cases he has worked on are alleged personal injury and/or property damages from mold and bacterial contamination/moisture intrusion, building renovation activities, insufficient outdoor air ventilation, off gassing of volatile organic compounds from building materials and coatings, malfunctioning gas heaters and carbon monoxide poisoning, and applications of pesticides. Mr. Offermann has testified with respect to the scientific admissibility of expert testimony regarding indoor air quality issues via Daubert and Kelly-Frye motions.



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