**Justification/Reason for Appeal**

1200 North Cahuenga Boulevard Project

CPC-2021-10170-GPA-ZC-HD; ENV-2021-10171-MND

## I. REASON FOR THE APPEAL

The Initial Study and Mitigated Negative Declaration ("MND") prepared for the 1200 North Cahuenga Boulevard Project (CPC-2021-10170-GPA-ZC-HD; ENV-2021-10171-MND) fails to comply with the California Environmental Quality Act ("CEQA"). Furthermore, the approval of the Site Plan Review entitlements (CPC-2021-10170-GPA-ZC-HD) was in error because (1) the City of Los Angeles ("City") must fully comply with CEQA prior to any approvals in furtherance of the Project and (2) the findings are not supported by substantial evidence. Therefore, the City of Los Angeles ("City") must set aside the Site Plan Review entitlements and prepare circulate an Environmental Impact Report ("EIR") prior to considering approvals for the Project.

## II. SPECIFICALLY THE POINTS AT ISSUE

The specific points at issue are set forth in the attached comment letter dated April 19, 2023. An EIR must be prepared to remedy these issues. Furthermore, proper CEQA review must be complete before the City approves the Project's entitlements. (*Orinda Ass'n. v. Bd. of Supervisors* (1986) 182 Cal.App.3d 1145, 1171 ["No agency may approve a project subject to CEQA until the entire CEQA process is completed and the overall project is lawfully approved."].) As such, the approval of the Project's Site Plan Review entitlements was in error. Additionally, by failing to properly conduct environmental review under CEQA, the City lacks substantial evidence to support its findings for the Site Plan Review entitlements.

## III. HOW YOU ARE AGGRIEVED BY THE DECISION

Members of appellant, SAFER, live and/or work in the vicinity of the proposed Project. They breathe the air, suffer noise impacts, and will suffer other environmental impacts of the Project unless those impacts are properly mitigated.

## IV. WHY YOU BELIEVE THE DECISION-MAKER ERRED OR ABUSED THEIR DISCRETION

The City Planning Commission approved a Site Plan Review (CPC-2021-10170-GPA-ZC-HD) and adopted the MND for the Project, despite expert evidence in the record establishing substantial evidence of a fair argument that the Project will have significant environmental impacts. The Department of City Planning should therefore have prepared an EIR and circulated the document prior to consideration of approvals for the Project. The City is not permitted to approve the Project's entitlements until proper CEQA review has been completed.

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**April 19, 2023**

*Via E-mail*

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**Re: Comment on Mitigated Negative Declaration, 1200 N. Cahuenga Boulevard Project (CPC-2021-10170-GPA-ZC-HD; ENV-2021-10171-MND) (April 20, 2023 Planning Commission Meeting Agenda Item No. 7)**

Dear Honorable President Millman, Vice President Choe, Planning Commissioners Cabildo, Lawshe, Leung, Mack, Perlman, and Zamora, Mr. Truong, and Ms. Lamas:

I am writing on behalf of Supporters Alliance for Environmental Responsibility ("SAFER") regarding the Initial Study and Mitigated Negative Declaration ("IS/MND"), ENV-2021-10171-MND, prepared for the 1200 N. Cahuenga Boulevard Project (Case No. CPC-2021-10170-GPA-ZC-HD), including all actions related or referring to the proposed demolition of an 8,941 square-foot portion of an existing, 28,389 square-foot building and the renovation of the remaining 19,448 square feet for office use, and the construction, use and maintenance of two new office buildings (totaling 55,814 square feet, including a 500 square-foot commercial use), for a total of 75,262 square feet of office space, located at 1200-1210 N Cahuenga Blvd, 6337-6351 W Lexington Ave, and 6332-6356 W La Mirada Ave in the City of Los Angeles ("Project"), to be heard as Agenda Item No. 7 at the April 20, 2023 Planning Commission meeting.

After reviewing the IS/MND, we conclude the IS/MND fails as an informational document, and that there is a fair argument that the Project may have adverse environmental impacts. Therefore, we request that the City of Los Angeles ("City") prepare an environmental impact report ("EIR") for the Project pursuant to the California Environmental Quality Act ("CEQA"), Public Resources Code ("PRC") section 21000, et seq.

This comment has been prepared with the assistance of Certified Industrial Hygienist Francis "Bud" Offerman, PE, CIH, and environmental consulting firm Soil/Water/Air Protection Enterprise ("SWAPE"). Mr. Offermann's comment and curriculum vitae are attached as Exhibit A hereto and is incorporated herein by reference in its entirety. SWAPE's comment and curriculum vitae are attached as Exhibit B hereto and is incorporated herein by reference in its entirety.

## I. PROJECT DESCRIPTION

The proposed 1200 N. Cahuenga Boulevard Project includes the demolition of an 8,941 square-foot portion of an existing, 28,389 square-foot building and the renovation of the remaining 19,448 square feet for office use, and the construction, use and maintenance of two (2), new office buildings (totaling 55,814 square feet, including a 500 square-foot commercial use), for a total of 75,262 square feet of office space. The project would have a maximum building height of 62 feet.

More specifically, the IS/MND states that the Project would replace an existing, vacant private school campus at the Project site with an approximately 75,262 square-foot creative office campus with ground-floor retail uses. The Project would include three buildings, Buildings A, B, and C, with an outdoor courtyard located between the buildings. The Project would demolish the school's subterranean parking lot and access ramp, topped with a recreational field and basketball court, and two playgrounds. The Project would also demolish 8,941 square feet of the existing approximately 28,389 square-foot private school building, but would preserve and upgrade with a few exterior modifications the remaining approximately 19,448 square feet of the building and its subterranean parking garage to be a creative office building.

Building A would be new, 35,000 square-foot four-story building located along the northern border of the Project site, that would be a maximum of 57' 1" in height. Building C would be new, 20,814 square-foot four-story building that would occupy the southwest corner of the site, and would be a maximum of 60' 11" in height. Building B would consist of the remaining 19,448 square feet of the existing two-story, 42' 6" tall school building. All three buildings would provide decks and balconies adjacent to the creative offices, and the buildings themselves would surround an outdoor courtyard for the use of the buildings' tenants. The Project would provide 158 vehicular parking spaces and 22 bicycle spaces within the Project's one-level subterranean parking garage extending under Buildings A and B. Buildings A and C would include a screened at-grade surface parking area on their first floors.

According to IS/MND, construction activities within the Project area will consist of demolition of 8,941 square feet of the existing two-story, approximately 28,389 square-foot, Stratford School Building, a recreational field and court topping a below-grade parking garage, and its access ramp and playground areas; grading, including export of up to an estimated 12,678 cubic yards of material, building construction, paving, and architectural coating.

The 53,557 square-foot Project site is located at 1200 – 1210 N. Cahuenga Boulevard, 6337 – 6357 W. Lexington Avenue, and 6332 – 6356 W. La Mirada Avenue in Los Angeles, California. The Project site is bordered by North Cahuenga Boulevard and residential and commercial uses to the west, by La Mirada Avenue and single-family residences to the north, by multi-family units and commercial uses and ultimately Vine Street to the east, and by Lexington Avenue and multi-family residences and commercial uses to the south. The Project site area is zoned as RD1.5-1XL and designated Low Medium II Residential in the Los Angeles Zone Information and Map Access System (ZIMAS).

The Project applicant Cahuenga Boulevard Owner, LLC is requesting that the Planning Commission approve the following actions:

1. The City Planning Commission shall consider, pursuant to CEQA Guidelines Section 15074(b), the whole of the administrative record, including the Mitigated Negative Declaration, No. ENV-2021-10171-MND ("Mitigated Negative Declaration"), and all comments received.

2. Pursuant to LAMC Section 11.5.6, a General Plan Amendment from Low Medium II to Community Commercial; and

3. Pursuant to LAMC Section 12.32-F, a Zone and Height District from RD1.5-1XL to C2-1.

The City is the lead agency for the proposed Project. An Initial Study was prepared by the City in accordance with CEQA (PRC § 21000 et seq.) and the CEQA Guidelines (Title 14, California Code of Regulations ("CCR"), § 15000 et seq.). Based on its findings, the City incorrectly determined that preparation of an MND would be appropriate under CEQA, rather than an EIR.

## II. LEGAL STANDARD

As the California Supreme Court has held, "[i]f no EIR has been prepared for a nonexempt project, but substantial evidence in the record supports a fair argument that the project may result in significant adverse impacts, the proper remedy is to order preparation of an EIR." (*Communities for a Better Env't v. South Coast Air Quality Mgmt. Dist.* (2010) 48 Cal.4th 310, 319–20 ("*CBE v. SCAQMD*") (citing *No Oil, Inc. v. City of Los Angeles* (1974) 13 Cal.3d 68, 75, 88; *Brentwood Assn. for No Drilling, Inc. v. City of Los Angeles* (1982) 134 Cal.App.3d 491, 504–05).) "Significant environmental effect" is defined very broadly as "a substantial or potentially substantial adverse change in the environment." (PRC § 21068; *see also* 14 CCR § 15382.) An effect on the environment need not be "momentous" to meet the CEQA test for significance; it is enough that the impacts are "not trivial." (*No Oil, Inc.*, 13 Cal.3d at 83.) "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 Env't v. Cal. Res. Agency* (2002) 103

Cal.App.4th 98, 109 ("*CBE v. CRA*").)

The EIR is the very heart of CEQA. (*Bakersfield Citizens for Local Control v. City of Bakersfield* (2004) 124 Cal.App.4th 1184, 1214 ("*Bakersfield Citizens*"); *Pocket Protectors v. City of Sacramento* (2004) 124 Cal.App.4th 903, 927.) The EIR is an "environmental 'alarm bell' whose purpose is to alert the public and its responsible officials to environmental changes before they have reached the ecological points of no return." (*Bakersfield Citizens*, 124 Cal.App.4th at 1220.) The EIR also functions as a "document of accountability," intended to "demonstrate to an apprehensive citizenry that the agency has, in fact, analyzed and considered the ecological implications of its action." (*Laurel Heights Improvements Assn. v. Regents of Univ. of Cal.* (1988) 47 Cal.3d 376, 392.) The EIR process "protects not only the environment but also informed self-government." (*Pocket Protectors*, 124 Cal.App.4th at 927.)

An EIR is required if "there is substantial evidence, in light of the whole record before the lead agency, that the project may have a significant effect on the environment." (PRC § 21080(d); *see also Pocket Protectors*, 124 Cal.App.4th at 927.) In very limited circumstances, an agency may avoid preparing an EIR by issuing a negative declaration, a written statement briefly indicating that a project will have no significant impact thus requiring no EIR (14 CCR § 15371), only if there is not even a "fair argument" that the project will have a significant environmental effect. (PRC §§ 21100, 21064.) Since "[t]he adoption of a negative declaration . . . has a terminal effect on the environmental review process," by allowing the agency "to dispense with the duty [to prepare an EIR]," negative declarations are allowed only in cases where "the proposed project will not affect the environment at all." (*Citizens of Lake Murray v. San Diego* (1989) 129 Cal.App.3d 436, 440.)

Mitigation measures may not be construed as project design elements or features in an environmental document under CEQA. The MND must "separately identify and analyze the significance of the impacts … before proposing mitigation measures…." (*Lotus vs. Department of Transportation* (2014) 223 Cal.App.4th 645, 658.) A "mitigation measure" is a measure designed to minimize a project's significant environmental impacts, (PRC § 21002.1(a)), while a "project" is defined as including "the whole of an action, which has a potential for resulting in either a direct physical change in the environment, or a reasonably foreseeable indirect physical change in the environment." (CEQA Guidelines § 15378(a).) Unlike mitigation measures, project elements are considered prior to making a significance determination. Measures are not technically "mitigation" under CEQA unless they are incorporated to avoid or minimize "significant" impacts. (PRC § 21100(b)(3).)

To ensure that the project's potential environmental impacts are fully analyzed and disclosed, and that the adequacy of proposed mitigation measures is considered in depth, mitigation measures that are not included in the project's design should not be treated as part of the project description. (*Lotus*, 223 Cal.App.4th at 654-55, 656 fn.8.) Mischaracterization of a mitigation measure as a project design element or feature is "significant," and therefore amounts to a material error, "when it precludes or obfuscates required disclosure of the project's environmental impacts and analysis of potential mitigation measures." (*Mission Bay Alliance v. Office of Community Investment & Infrastructure* (2016) 6 Cal.App.5th 160, 185.)

Where an initial study shows that the project may have a significant effect on the environment, a mitigated negative declaration may be appropriate. However, a mitigated negative declaration is proper *only* if the project revisions would avoid or mitigate the potentially significant effects identified in the initial study "to a point where clearly no significant effect on the environment would occur, and…there is no substantial evidence in light of the whole record before the public agency that the project, as revised, may have a significant effect on the environment." (PRC §§ 21064.5, 21080(c)(2); *Mejia v. City of Los Angeles* (2005) 130 Cal.App.4th 322, 331.) In that context, "may" means a reasonable possibility of a significant effect on the environment. (PRC §§ 21082.2(a), 21100, 21151(a); *Pocket Protectors*, 124 Cal.App.4th at 927; *League for Protection of Oakland's etc. Historic Res. v. City of Oakland* (1997) 52 Cal.App.4th 896, 904–05.)

Under the "fair argument" standard, an EIR is required if any substantial evidence in the record indicates that a project may have an adverse environmental effect—even if contrary evidence exists to support the agency's decision. (14 CCR § 15064(f)(1); *Pocket Protectors*, 124 Cal.App.4th at 931; *Stanislaus Audubon Society v. County of Stanislaus* (1995) 33 Cal.App.4th 144, 150-51; *Quail Botanical Gardens Found., Inc. v. City of Encinitas* (1994) 29 Cal.App.4th 1597, 1602.) The "fair argument" standard creates a "low threshold" favoring environmental review through an EIR rather than through issuance of negative declarations or notices of exemption from CEQA. (*Pocket Protectors*, 124 Cal.App.4th at 928.)

The "fair argument" standard is virtually the opposite of the typical deferential standard accorded to agencies. As a leading CEQA treatise explains:

> This 'fair argument' standard is very different from the standard normally followed by public agencies in their decision making. Ordinarily, public agencies weigh the evidence in the record and reach a decision based on a preponderance of the evidence. [Citation]. The fair argument standard, by contrast, prevents the lead agency from weighing competing evidence to determine who has a better argument concerning the likelihood or extent of a potential environmental impact.

(Kostka & Zishcke, *Practice Under the CEQA*, §6.37 (2d ed. Cal. CEB 2021).) The Courts have explained that "it is a question of law, not fact, whether a fair argument exists, and the courts owe no deference to the lead agency's determination. Review is de novo, with *a preference for resolving doubts in favor of environmental review*." (*Pocket Protectors*, 124 Cal.App.4th at 928 (emphasis in original).)

CEQA requires that an environmental document include a description of the project's environmental setting or "baseline." (CEQA Guidelines § 15063(d)(2).) The CEQA "baseline" is the set of environmental conditions against which to compare a project's anticipated impacts. (*CBE v. SCAQMD*, 48 Cal.4th at 321.) CEQA Guidelines section 15125(a) states, in pertinent part, that a lead agency's environmental review under CEQA:

> …must include a description of the physical environmental conditions in the

> vicinity of the project, as they exist at the time [environmental analysis] is commenced, from both a local and regional perspective. This environmental setting will normally constitute the baseline physical conditions by which a Lead Agency determines whether an impact is significant.

(*See Save Our Peninsula Committee v. County of Monterey* (2001) 87 Cal.App.4th 99, 124–25 ("*Save Our Peninsula*").) As the court of appeal has explained, "the impacts of the project must be measured against the 'real conditions on the ground,'" and not against hypothetical permitted levels. (*Id*. at 121–23.)

## III. DISCUSSION

There is a fair argument that the proposed Project may have unmitigated adverse environmental impacts. An EIR is therefore required to adequately analyze and mitigate the impacts of the Project.

### A. There is Substantial Evidence of a Fair Argument that the Project will have a Significant Health Risk Impact from Its Indoor Air Quality Impacts Requiring an EIR.

Certified Industrial Hygienist, Francis "Bud" Offermann, PE, CIH, has conducted a review of the proposed Project and relevant documents regarding the Project's indoor air emissions. Indoor Environmental Engineering Comments (March 14, 2023) (Exhibit A). Mr. Offermann concludes that it is likely that the Project will expose commercial and office employees of the Project to significant impacts related to indoor air quality, and in particular, emissions of the cancer-causing chemical formaldehyde. Mr. Offermann is a leading expert on indoor air quality and has published extensively on the topic. Mr. Offermann's expert comments and curriculum vitae are attached as Exhibit A.

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

Formaldehyde is a known human carcinogen. Mr. Offermann states that there is a fair argument that the employees of the Project's commercial and office spaces are expected to experience significant work-day exposures. (*Id*., pp. 3-5.) This exposure of employees would result in "significant cancer risks resulting from exposures to formaldehyde released by the building materials and furnishing commonly found in offices, warehouses, residences and hotels." (*Id*., p. 4.) Assuming they work eight hour days, five days per week, an employee would be exposed to a cancer risk of approximately 17.7 per million, assuming all materials are compliant with the California Air Resources Board's formaldehyde airborne toxics control measure. (*Id.*, pp. 4-5.) This exceeds the South Coast Air Quality Management District's ("SCAQMD") CEQA significance threshold for airborne cancer risk of 10 per million. (*Id.*, pp. 2, 4.)

Mr. Offermann also notes that the high cancer risk that may be posed by the Project's indoor air emissions likely will be exacerbated by the additional cancer risk that exists as a result of the Project's location near roadways with moderate to high traffic (e.g., North Cahuenga Boulevard, Lexington Avenue, Cole Avenue, Vine Street, Fountain Avenue, Santa Monica Boulevard, etc.) and the high levels of $PM_{2.5}$ already present in the ambient air. (Ex. A, pp. 10-12.) No analysis has been conducted of the significant cumulative health impacts that will result to future residents and employees of the Project.

Mr. Offermann concludes that these significant environmental impacts should be analyzed in an EIR and mitigation measures should be imposed to reduce the risk of formaldehyde exposure. (*Id.*, p. 4.) Mr. Offermann identifies mitigation measures that are available to reduce these significant health risks, including the installation of air filters and a requirement that the applicant 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 or ultra-low emitting formaldehyde (ULEF) resins in the buildings' interiors. (*Id.*, pp. 12-13.)

The City has a duty to investigate issues relating to a project's potential environmental impacts, especially those issues raised by an expert's comments. (*See Cty. Sanitation Dist. No. 2 v. Cty. of Kern*, (2005) 127 Cal.App.4th 1544, 1597–98 ("under CEQA, the lead agency bears a burden to investigate potential environmental impacts").) In addition to assessing the Project's potential health impacts to residents and employees, Mr. Offermann identifies the investigatory path that the City should be following in developing an EIR to more precisely evaluate the Projects' future formaldehyde emissions and establishing mitigation measures that reduce the cancer risk below the SCAQMD level. (Ex. A, pp. 5-10.) Such an analysis would be similar in form to the air quality modeling and traffic modeling typically conducted as part of a CEQA review.

The failure 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*"). At issue in *CBIA* was whether the Air District could enact CEQA guidelines that advised lead agencies that they must analyze the impacts of adjacent environmental conditions on a project. The Supreme Court held that CEQA does not generally require lead agencies to consider the environment's effects on a project. (*CBIA*, 62 Cal.4th at 800-801.) However, to the extent a project may exacerbate existing adverse environmental conditions at or near a project site, those would still have to be considered pursuant to CEQA. (*Id*. at 801 ("CEQA calls upon an agency to evaluate existing conditions in order to assess whether a project could exacerbate hazards that are already present").) 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. Employees of the commercial and office spaces will be users of the Project. Once the project is built, formaldehyde emissions will begin at levels that pose significant health risks. Rather than excusing the City from addressing the impacts of carcinogens emitted into the indoor air from the project, the Supreme Court in *CBIA* expressly finds that this type of effect by the project on the environment and a "project's users" must be addressed in the CEQA process.

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

Because Mr. Offermann's expert review is substantial evidence of a fair argument of a significant environmental impact to future users of the Project, an EIR must be prepared to disclose and mitigate those impacts.

### B. The IS/MND Fails to Adequately Evaluate the Project's Potential Significant Air Quality Impacts.

Air quality experts Matt Hagemann, P.G., C.Hg., and Paul E. Rosenfeld, Ph.D., of the Soil/Water/Air Protection Enterprise ("SWAPE") reviewed the IS/MND and related appendices and found that the IS/MND's conclusions as to the Project's air quality impacts were not supported by substantial evidence. Instead, SWAPE's analysis found that there is substantial evidence of a fair argument that the Project could result in significant adverse air quality impacts from construction and operation. An EIR is therefore required. SWAPE's comment and curriculum vitae are attached as Exhibit B.

1. <u>The IS/MND relied on unsubstantiated input parameters to estimate project emissions and thus failed to adequately analyze the project's air quality impacts.</u>

SWAPE found that the IS/MND incorrectly estimated the Project's operational emissions and therefore cannot be relied upon to determine the significance of the Project's impacts on local and regional air quality. The IS/MND relies on emissions calculated from CalEEMod

2020.4.0. (IS/MND, p. 57; Ex. B, p. 2.) This model, which is used to generate a project's construction and operational emissions, relies on recommended default values based on site specific information related to a number of factors. (Ex. B, p. 2.) CEQA requires any changes to the default values to be justified by substantial evidence. (*Id*.) SWAPE reviewed the Project's CalEEMod output files, provided in the Air Quality, Greenhouse Gas, and Energy Study ("AQ & GHG Study") as Appendix A to the IS/MND, and found that the values input into the model were inconsistent with information provided in the IS/MND, resulting in an underestimation of the Project's operational emissions. (*Id.*, pp. 3-4.) Specifically, SWAPE found that the following values used in the IS/MND's air quality analysis were either inconsistent with information provided in the IS/MND or otherwise unjustified: "***Underestimated Number of Operational Vehicle Trips***." (*Id.*)

Thus, the IS/MND's air quality analysis and subsequent less-than-significant impact conclusion should not be relied upon. An EIR should be prepared that includes an updated air quality analysis.

**C. The IS/MND Fails to Adequately Analyze and Mitigate the Project's Potential Significant Greenhouse Gas Impacts.**

The IS/MND estimates that the Project would generate net annual greenhouse gas ("GHG") emissions of 627.5 metric tons of carbon dioxide equivalents per year ("MT $CO_2$ e/year"), which would not exceed the City's threshold. (Ex. B, p. 4 (citing IS/MND, p. 113, Table 4.9).) Furthermore, the IS/MND relies upon the consistency with CARB's *Scoping Plan*, SCAG's 2020-2045 *RTP/SCS*, and the City's *Green New Deal* in order to conclude that the Project would result in a less-than-significant GHG impact. (*Id*., p. 5 (citing IS/MND, pp. 112, 123).) However, SWAPE concludes that the IS/MND's GHG analysis, as well as its subsequent less-than-significant conclusion, is incorrect for several reasons. (*See* Ex. B, pp. 5-8.)

First, SWAPE points out that the IS/MND's GHG analysis relies upon a flawed air model, as discussed above. (*Id.*, pp. 5-6.) Specifically, "the IS/MND's model relies on underestimated operational vehicle trip rates, and [a]s a result, the model underestimates the Project's operational emissions." (*Id.*, p. 5.) As a result of relying on an incorrect and unsubstantiated air model, the Project's GHG emissions could be underestimated. Therefore, the IS/MND's quantitative GHG analysis should not be relied upon to determine Project significance. SWAPE recommends that "[a]n EIR should be prepared that adequately assesses the potential GHG impacts that operation of the proposed Project may have on the environment." (*Id.*, p. 6.)

Second, SWAPE's updated air model, which "included the correct operational daily vehicle trip rate of 766," indicates a potential significant impact in GHG emissions. (*See* Ex. B, pp. 6-7.) According to SWAPE:

> In an effort to more accurately estimate the Project's operational emissions, we prepared an updated CalEEMod model, using the Project-specific information provided by the IS/MND. In our updated model, we included the correct

> operational daily vehicle trip rate of 766. To quantitatively evaluate the Project's GHG emissions, we applied the SCAQMD 2035 service population efficiency target of 3.0 metric tons of carbon dioxide equivalents per service population per year ("MT $CO2_e$/SP/year"), which was calculated by applying a 40% reduction to the 2020 targets. When applying this threshold, our updated air model indicates a potentially significant GHG impact. (*Id.*, p. 6.)
>
> [T]he Project's service population efficiency value, as estimated by the SWAPE's net annual GHG emissions and SP, exceeds the SCAQMD 2035 efficiency target of 3.0 MT $CO2_e$/SP/year, thus resulting in a potentially significant impact. As such, ***an EIR should be prepared, including an updated GHG analysis and incorporating additional mitigation measures to reduce the Project's GHG emissions to less-than-significant levels***. (*Id.*, p. 7. (emphasis added).)

Thus, an EIR should be prepared to include an updated GHG analysis and incorporate mitigation measures intended to reduce GHG emissions to less-than-significant levels

Third, the IS/MND incorrectly concludes that it is consistent with CARB's 2017 Climate Scoping Plan. (Ex. B, pp. 7-8.) However, as SWAPE points out, the IS/MND fails to consider the performance-based standards underlying CARB's *Scoping Plan*. (*Id.*, p. 7.) Because "the IS/MND fails to evaluate the Project's consistency with the CARB 2017 *Scoping Plan* performance-based daily VMT per capita projections," SWAPE concludes that "the IS/MND's claim that the proposed Project would not conflict with the CARB 2017 *Scoping Plan* is unsupported." (*Id.*, p. 8.) Thus, SWAPE recommends that "[a]n EIR should be prepared for the proposed Project to provide additional information and analysis to conclude less-than-significant GHG impacts." (*Id.*)

Fourth, the IS/MND fails to consider the performance-based standards under SCAG's *RTP/SCS*. (Ex. B, pp. 8-9.) Specifically, SWAPE notes that "the IS/MND fails to consider whether or not the Project meets any of the specific performance-based goals underlying SCAG's *RTP/SCS* and SB 375, such as: i) per capita GHG emission targets, or ii) daily vehicles miles traveled ("VMT") per capita benchmarks." (*Id.*, p. 8.) Based on SWAPE's quantitative consistency evaluation utilizing these standards, SWAPE concludes that the IS/MND's GHG significance determination regarding the Project's consistency with applicable plans and policies should not be relied upon. (*Id.*, pp. 8-9.) Thus, SWAPE recommends that an EIR should be prepared to provide additional analysis and information to conclude less-than-significant GHG impacts as well as adequately support that conclusion.

SWAPE's analysis demonstrated potentially significant air quality and GHG impacts as a result of the Project that necessitate mitigation. SWAPE also proposes several feasible mitigation measures to reduce construction and operational emissions. (*See* Ex. B, pp. 9-12.) In addition to implementing these measures, an EIR should be included with updated air quality and GHG analyses.

**D. There is Substantial Evidence of a Fair Argument that the Project will have Significant Hazards and Hazardous Materials Impacts Requiring .**

The IS/MND contains substantial evidence of a fair argument that the Project may have significant health and environmental impacts due to soil contamination, and the evidence in the record does not support that the potential impacts will be mitigated to a level of significance. (*See* Ex. B, pp. 1-2.)

Specifically, the IS/MND provides evidence that there may be significant impacts from contaminated soil at the Project site, but fails to adequately analyze or mitigate those impacts. The 2022 Vapor Intrusion Assessment Report, included as Appendix H.2 to the IS/MND, states that tetrachloroethylene ("PCE") was detected at significant concentrations in soil vapor and indoor air at the Project site. According to U.S. Centers for Disease Control and Prevention's National Institute for Occupational Safety and Health (NIOSH), "[e]xposure to tetrachloroethylene may cause irritation eyes, skin, nose, throat, and respiratory system. It may also cause liver damage and is a potential occupational carcinogen."[1]

SWAPE notes that "[t]he IS/MND associated the PCE detections with a chlorinated solvent release from the Paragon Cleaners site," which is currently "an open case undergoing soil gas and groundwater remediation under Los Angeles Regional Water Quality Control Board ("RWQCB") oversight."[2] (Ex. B, p. 1.) SWAPE reviewed the IS/MND's Vapor Intrusion Assessment Report and found that the report "concluded that subslab and indoor vapor concentrations of PCE exceed the commercial/industrial vapor intrusion screening levels due to migration of PCE-impacted groundwater from Paragon Cleaners." (*Id.*, p. 2.) In response to the report of soil contamination on the Project site, the IS/MND included mitigation measures ("MM") HAZ-1, HAZ-2, and HAZ-3. (*See* IS/MND, p. 132.) As such, this identification of potentially significant soil contamination impacts as result of the Project is substantial evidence of a fair argument that the Project involves significant risks to public health and the environment from soil contamination. Additionally, the IS/MND's mitigation measures attempting to address the potential significant impacts from the contaminated soil at the Project site, although potentially inadequate, also provide substantial evidence that the Project could cause significant health and environmental impacts.

Moreover, "[n]o mention is made in the IS/MND of any correspondence with the RWQCB regarding the findings of PCE in soil gas and indoor air at the Project site nor of any outreach for regulatory review and approval of the mitigation that is proposed." (Ex. B, p. 2.) As SWAPE points out, "RWQCB review and approval is important to ensure mitigation as proposed in the IS/MND is [protective] of construction worker health and safety as well as the health and safety of future office workers." (*Id.*) Thus, SWAPE concludes that "[a]n EIR should be prepared to include documentation of RWQCB review of the 2022 Vapor Intrusion Assessment

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[1] *See* NOISH, CDC, Tetrachloroethylene (Perchloroethylene): Overview, *available at:* https://www.cdc.gov/niosh/topics/tetrachloro/default.html#Value.
[2] "SNOW WHITE CLEANERS (60000967)" EnviroStor, *available at:* https://www.envirostor.dtsc.ca.gov/public/profile_report?global_id=60000967.

Report and evaluation of the mitigation that is proposed in MM HAZ-1, HAZ-2, and HAZ-3." (*Id.*)

In conclusion, the Project requires an EIR that includes adequate analysis and mitigation measures of soil contamination impacts.

## IV. CONCLUSION

For the foregoing reasons, the IS/MND for the Project should be withdrawn, an EIR should be prepared, and the draft EIR should be circulated for public review and comment in accordance with CEQA. We reserve the right to supplement these comments, including but not limited to at public hearings concerning the Project. (*Galante Vineyards v. Monterey Peninsula Water Management Dist.*, 60 Cal. App. 4th 1109, 1121 (1997).) Thank you for considering these comments.

Sincerely,

Victoria Yundt

Victoria Yundt
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# EXHIBIT A

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Date: March 14, 2023

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From: Francis J. Offermann PE CIH

Subject: Indoor Air Quality: 1200 N. Cahuenga Boulevard Project, Los Angeles, CA
(IEE File Reference: P-4692)

Pages: 19

## 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.

**<u>Indoor Formaldehyde Concentrations Impact</u>**. 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 µg/day. The NSRL concentration of formaldehyde that represents a daily dose of 40 µg is 2 µg/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 µg/m$^3$. The median indoor formaldehyde concentration was 36 µg/m$^3$, and ranged from 4.8 to 136 µg/m$^3$, which corresponds to a median exceedance of the 2 µg/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 µg/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 South Coast Air Quality Management District (SCAQMD, 2015).

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 µg/m$^3$ to 28% for the Acute REL of 55 µg/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 $\mu g/m^3$ (18.2 ppb) as compared to a median of 36 $\mu g/m^3$ 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 $\mu g/m^3$, which is 33% lower than the 36 $\mu g/m^3$ 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).

With respect to 1200 N. Cahuenga Boulevard Project, Los Angeles, CA, the buildings consist of commercial spaces.

The employees of the commercial spaces are expected to experience significant indoor exposures (e.g., 40 hours per week, 50 weeks per year). These exposures for employees are anticipated to result in significant cancer risks resulting from exposures to formaldehyde released by the building materials and furnishing commonly found in offices, warehouses, residences and hotels.

Because the commercial spaces will be constructed with CARB Phase 2 Formaldehyde ATCM materials, and be ventilated with the minimum code required amount of outdoor air, the indoor 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 μg/$m^3$ (Singer et. al., 2020)

Assuming that the employees of commercial spaces work 8 hours per day and inhale 20 $m^3$ of air per day, the formaldehyde dose per work-day at the offices is 161 μg/day.

Assuming that these employees work 5 days per week and 50 weeks per year for 45 years (start at age 20 and retire at age 65) the average 70-year lifetime formaldehyde daily dose is 70.9 μg/day.

This is 1.77 times the NSRL (OEHHA, 2017a) of 40 μg/day and represents a cancer risk of 17.7 per million, which exceeds the CEQA cancer risk of 10 per million. This impact should be analyzed in an environmental impact report ("EIR"), and the agency should impose all feasible mitigation measures to reduce this impact. Several feasible mitigation measures are discussed below and these and other measures should be analyzed in an EIR.

In addition, we note that the average outdoor air concentration of formaldehyde in California is 3 ppb, or 3.7 μg/$m^3$, (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.

Additionally, the SCAQMD's Multiple Air Toxics Exposure Study ("MATES V") identifies an existing cancer risk at the Project site of 1,245 per million due to the site's elevated ambient air contaminant concentrations, which are due to the area's high levels of vehicle traffic. These impacts would further exacerbate the pre-existing cancer risk to the building occupants, which result from exposure to formaldehyde in both indoor and outdoor air.

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

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

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

<u>Pre-Construction Building Material/Furnishing Formaldehyde Emissions Assessment</u>

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 (µg/h) from the product of the area-specific formaldehyde emission rate (µg/$m^2$-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 (µg/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., $\mu g/m^2$-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 $\mu g/m^2$-h, but not the actual measured specific emission rate, which may be 3, 18, or 30 $\mu g/m^2$-h. These area-specific emission rates determined from the product certifications of CDPH, BIFA, and other certification programs can be used as an initial estimate of the formaldehyde emission rate.

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

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

4.) Calculate the Total Formaldehyde Emission Rate. For each IAQ Zone, calculate the total formaldehyde emission rate (i.e. 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/m$^3$) 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 (m$^3$/h) for the IAQ Zone.

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

where:

$C_{in}$ = indoor formaldehyde concentration (µg/m$^3$)

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

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

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

6.) Calculate the Indoor Exposure Cancer and Non-Cancer Health Risks. For each IAQ Zone, calculate the cancer and non-cancer health risks from the indoor formaldehyde concentrations determined in Step 5 and as described in the OEHHA Air Toxics Hot Spots

Program Risk Assessment Guidelines; Guidance Manual for Preparation of Health Risk Assessments (OEHHA, 2015).

7.) <u>Mitigate Indoor Formaldehyde Exposures of exceeding the CEQA Cancer and/or Non-Cancer Health Risks</u>. 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 Initial Study/Mitigated Negative Declaration – 1200 N. Cahuenga Boulevard Project, Los Angeles, CA (EcoTierra, 2022), the Project is close to roads with moderate to high traffic (e.g., North Cahuenga Boulevard, Lexington Avenue, Cole Avenue, Vine Street, Fountain Avenue, Santa Monica Boulevard, etc.).

The Initial Study/Mitigated Negative Declaration – 1200 N. Cahuenga Boulevard Project, Los Angeles, CA (EcoTierra, 2022), states in Table 4.27 that the modeled future traffic noise with the Project will range from 64.6 to 72.8 dBA CNEL. Thus, the Project site is a sound impacted area.

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

**$PM_{2.5}$ Outdoor Concentrations Impact**. An additional impact of the nearby motor vehicle traffic associated with this project, are the outdoor concentrations of $PM_{2.5}$. According to the Initial Study/Mitigated Negative Declaration – 1200 N. Cahuenga Boulevard Project, Los Angeles, CA (EcoTierra, 2022), the Project is located in the South Coast Air Basin, which is a State and Federal non-attainment area for $PM_{2.5}$.

Additionally, the SCAQMD's MATES V study cites an existing cancer risk of 1,245 per million at the Project site due to the site's high concentration of ambient air contaminants resulting from the area's high levels of motor vehicle traffic.

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 $\mu g/m^3$, or the National 24-hour average exceedence concentration of 35 $\mu g/m^3$, 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 insure indoor formaldehyde concentrations that are below the CEQA cancer risk of 10 per million. Only composite wood products manufactured with CARB approved no-added formaldehyde (NAF) resins, such as resins made from soy, polyvinyl acetate, or methylene diisocyanate can insure that the OEHHA cancer risk of 10 per million is met.

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

It is important to note that we are not asking that the builder "speculate" on what and how much composite materials be used, but rather at the design stage to select composite wood materials based on the formaldehyde emission rates that manufacturers routinely conduct using the California Department of Health "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions for Indoor Sources Using Environmental Chambers", (CDPH, 2017), and use the procedure described above (i.e.

Pre-Construction Building Material/Furnishing Formaldehyde Emissions Assessment) to insure that the materials selected achieve acceptable cancer risks from material off gassing of formaldehyde.

Outdoor Air Ventilation Mitigation. Provide each habitable room with a continuous mechanical supply of outdoor air that meets or exceeds the California 2016 Building Energy Efficiency Standards (California Energy Commission, 2015) requirements of the greater of 15 cfm/occupant or 0.15 cfm/ft$^2$ 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.

## References

BIFA. 2018. BIFMA Product Safety and Performance Standards and Guidelines. www.bifma.org/page/standardsoverview

California Air Resources Board. 2009. Airborne Toxic Control Measure to Reduce Formaldehyde Emissions from Composite Wood Products. California Environmental

Protection Agency, Sacramento, CA.
https://www.arb.ca.gov/regact/2007/compwood07/fro-final.pdf

California Air Resources Board. 2011. Toxic Air Contaminant Identification List. California Environmental Protection Agency, Sacramento, CA. https://www.arb.ca.gov/toxics/id/taclist.htm

California Building Code. 2001. California Code of Regulations, Title 24, Part 2 Volume 1, Appendix Chapter 12, Interior Environment, Division 1, Ventilation, Section 1207: 2001 California Building Code, California Building Standards Commission. Sacramento, CA.

California Building Standards Commission (2014). 2013 California Green Building Standards Code. California Code of Regulations, Title 24, Part 11. California Building Standards Commission, Sacramento, CA http://www.bsc.ca.gov/Home/CALGreen.aspx.

California Energy Commission, PIER Program. CEC-500-2007-033. Final Report, ARB Contract 03-326. Available at: www.arb.ca.gov/research/apr/past/03-326.pdf.

California Energy Commission, 2015. 2016 Building Energy Efficiency Standards for Residential and Nonresidential Buildings, California Code of Regulations, Title 24, Part 6. http://www.energy.ca.gov/2015publications/CEC-400-2015-037/CEC-400-2015-037-CMF.pdf

CDPH. 2017. Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions for Indoor Sources Using Environmental Chambers, Version 1.1. California Department of Public Health, Richmond, CA. https://www.cdph.ca.gov/Programs/CCDPHP/ DEODC/EHLB/IAQ/Pages/VOC.aspx.

EcoTierra Consulting. 2022. Initial Study/Mitigated Negative Declaration – 1200 N. Cahuenga Boulevard Project, Los Angeles, CA.

EPA. 2011. Exposure Factors Handbook: 2011 Edition, Chapter 16 – Activity Factors. Report EPA/600/R-09/052F, September 2011. U.S. Environmental Protection Agency, Washington, D.C.

Hodgson, A. T., D. Beal, J.E.R. McIlvaine. 2002. Sources of formaldehyde, other aldehydes and terpenes in a new manufactured house. Indoor Air 12: 235–242.

OEHHA (Office of Environmental Health Hazard Assessment). 2015. Air Toxics Hot Spots Program Risk Assessment Guidelines; Guidance Manual for Preparation of Health Risk Assessments.

OEHHA (Office of Environmental Health Hazard Assessment). 2017a. Proposition 65 Safe Harbor Levels. No Significant Risk Levels for Carcinogens and Maximum Allowable Dose Levels for Chemicals Causing Reproductive Toxicity. Available at: http://www.oehha.ca.gov/prop65/pdf/safeharbor081513.pdf

OEHHA - Office of Environmental Health Hazard Assessment. 2017b. All OEHHA Acute, 8-hour and Chronic Reference Exposure Levels. Available at: http://oehha.ca.gov/air/allrels.html

Offermann, F. J. 2009. Ventilation and Indoor Air Quality in New Homes. California Air Resources Board and California Energy Commission, PIER Energy-Related Environmental Research Program. Collaborative Report. CEC-500-2009-085. https://www.arb.ca.gov/research/apr/past/04-310.pdf

Offermann, F. J. and A. T. Hodgson. 2011. Emission Rates of Volatile Organic Compounds in New Homes. Proceedings Indoor Air 2011 (12th International Conference on Indoor Air Quality and Climate 2011), June 5-10, 2011, Austin, TX.

Singer, B.C, Chan, W.R, Kim, Y., Offermann, F.J., and Walker I.S. 2020. Indoor Air Quality in California Homes with Code-Required Mechanical Ventilation. Indoor Air, Vol 30, Issue 5, 885-899.

South Coast Air Quality Management District (SCAQMD). 2015. California Environmental Quality Act Air Quality Handbook. South Coast Air Quality Management District, Diamond Bar, CA, http://www.aqmd.gov/home/rules-compliance/ceqa/air-quality-analysis-handbook

USGBC. 2014. LEED BD+C Homes v4. U.S. Green Building Council, Washington, D.C. http://www.usgbc.org/credits/homes/v4

## 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 $\mu g/m^3$ (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, Richmond, CA. https://www.cdph.ca.gov/Programs/CCDPHP/DEODC/EHLB/IAQ/Pages/VOC.aspx.

For the outdoor air ventilation rate I used the 2019 Title 24 code required mechanical ventilation rate (ASHRAE 62.2) of 106 cfm (180 $m^3/h$) 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 $ft^2$ (0.7% of the floor area), or
Particle Board – 30 $ft^2$ (1.3% of the floor area), or
Hardwood Plywood – 54 $ft^2$ (2.4% of the floor area), or
Thin MDF – 46 $ft^2$ (2.0 % of the floor area).

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

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

Clearly the CARB ATCM does not regulate the formaldehyde emissions from composite wood products such that the potentially large areas of these products, such as for flooring, baseboards, interior doors, window and door trims, and kitchen and bathroom cabinetry, could be used without causing indoor formaldehyde concentrations that result in CEQA cancer risks that substantially exceed 10 per million for occupants with continuous occupancy.

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

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

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

# EXHIBIT B

**SWAPE** Technical Consultation, Data Analysis and Litigation Support for the Environment

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April 17, 2023

Victoria Yundt
Lozeau | Drury LLP
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**Subject: Comments on the 1200 N. Cahuenga Boulevard Project**

Dear Ms. Yundt,

We have reviewed the January 2023 Initial Study and Mitigated Negative Declaration ("IS/MND") for the 1200 N. Cahuenga Boulevard Project ("Project") located in the City of Los Angeles ("City"). The Project proposes to demolish 8,941-square-feet ("SF") of existing buildings and construct 55,814-SF of office space, and 156 parking spaces, on the 1.23-acre site.

Our review concludes that the IS/MND fails to adequately evaluate the Project's hazards, hazardous materials, air quality, and greenhouse gas impacts. As a result, emissions and health risk impacts associated with construction and operation of the proposed Project are underestimated and inadequately addressed. An Environmental Impact Report ("EIR") should be prepared to adequately assess and mitigate the potential hazards, hazardous materials, air quality, and greenhouse gas impacts that the project may have on the environment.

# Hazards and Hazardous Materials

## Inadequate Disclosure and Analysis of Impacts

Tetrachloroethylene ("PCE") was detected at significant concentrations in soil vapor and indoor air at the Project site according to the 2022 Vapor Intrusion Assessment Report, included as Appendix H.2 to the IS/MND. The IS/MND associated the PCE detections with a chlorinated solvent release from the Paragon Cleaners site, an open case undergoing soil gas and groundwater remediation under Los Angeles Regional Water Quality Control Board ("RWQCB") oversight.[1] The Vapor Intrusion Assessment

[1] "SNOW WHITE CLEANERS (60000967)" EnviroStor, *available at:* https://www.envirostor.dtsc.ca.gov/public/profile_report?global_id=60000967

Report concluded that subslab and indoor vapor concentrations of PCE exceed the commercial/industrial vapor intrusion screening levels due to migration of PCE-impacted groundwater from Paragon Cleaners. In response, the IS/MND calls for the following mitigation (see excerpt below) (p. 132):

> **MM HAZ-1:** A vapor barrier shall be installed along the base and walls all subterranean garages. The vapor barrier shall be installed to include a sub-slab collection and ventilation system during construction. Based on guidance from the regulatory agency, the vapor barrier shall be operated as an active or passive system.
>
> **MM HAZ-2:** Ongoing annual monitoring and reporting shall occur after construction and during occupancy to evaluate the efficiency of the vapor barriers and to confirm that indoor air is safe for occupants. Monitoring shall include a combination of indoor air sampling, subslab sampling, and/or differential pressure monitoring. Regulatory oversight, monitoring, and reporting shall be required for 10 years.
>
> **MM HAZ-3:** All elevators running from the parking lots up into the overlying spaces shall be monitored during occupancy to confirm that indoor air is safe for occupants. Monitoring shall include a combination of indoor air sampling, and/or differential pressure monitoring.

No mention is made in the IS/MND of any correspondence with the RWQCB regarding the findings of PCE in soil gas and indoor air at the Project site nor of any outreach for regulatory review and approval of the mitigation that is proposed. An EIR should be prepared to include documentation of RWQCB review of the 2022 Vapor Intrusion Assessment Report and evaluation of the mitigation that is proposed in MM HAZ-1, HAZ-2, and HAZ-3. RWQCB review and approval is important to ensure mitigation as proposed in the IS/MND is projective of construction worker health and safety as well as the health and safety of future office workers.

## Air Quality

### Unsubstantiated Input Parameters Used to Estimate Project Emissions

The IS/MND's air quality analysis relies on emissions calculated with the California Emissions Estimator Model ("CalEEMod") Version 2020.4.0 (p. 57).[2] CalEEMod provides recommended default values based on site-specific information, such as land use type, meteorological data, total lot acreage, project type and typical equipment associated with project type. If more specific project information is known, the user can change the default values and input project-specific values, but the California Environmental Quality Act ("CEQA") requires that such changes be justified by substantial evidence. Once all of the values are inputted into the model, the Project's construction and operational emissions are calculated, and "output files" are generated. These output files disclose to the reader what parameters are utilized in calculating the Project's air pollutant emissions and make known which default values are changed as well as provide justification for the values selected.

[2] "CalEEMod Version 2020.4.0." California Air Pollution Control Officers Association (CAPCOA), May 2021, *available at:* https://www.aqmd.gov/caleemod/download-model.

When reviewing the Project's CalEEMod output files, provided in the Air Quality, Greenhouse Gas, and Energy Study ("AQ & GHG Study") as Appendix A to the IS/MND, we found that the model inputs were not consistent with information disclosed in the IS/MND. As a result, the Project's construction and operational emissions are underestimated. An EIR should be prepared to include an updated air quality analysis that adequately evaluates the impacts that construction and operation of the Project will have on local and regional air quality.

### *Underestimated Number of Operational Vehicle Trips*

According to the Traffic Assessment ("TA"), provided as Appendix K.1 to the IS/MND, the proposed Project is expected to generate 344 net daily operational vehicle trips (see excerpt below) (p. 26, Table 3).

| ITE Code | Description | Size | Daily Traffic | AM Peak Hour Total | AM Peak Hour In | AM Peak Hour Out | PM Peak Hour Total | PM Peak Hour In | PM Peak Hour Out |
|---|---|---|---|---|---|---|---|---|---|
| | **Proposed Project** | | | | | | | | |
| 710 | Creative Office | 74,762 sf | 810 | 114 | 100 | 14 | 108 | 19 | 89 |
| | Transit Trips | 15% | (122) | (17) | (15) | (2) | (16) | (3) | (13) |
| | Subtotal Creative Office | | 688 | 97 | 85 | 12 | 92 | 16 | 76 |
| 936 | Small Retail/Restaurant* | 500 sf | 313 | 47 | 24 | 23 | 16 | 8 | 8 |
| | Internal Trips | 75% | (235) | (35) | (18) | (17) | (12) | (6) | (6) |
| | Subtotal Small Retail/Restaurant | | 78 | 12 | 6 | 6 | 4 | 2 | 2 |
| | **Subtotal Proposed (Office + Retail)** | 75,262 sf | **766** | **109** | **91** | **18** | **96** | **18** | **78** |
| | **Existing to be removed** | | | | | | | | |
| 532 | Private School | 200 students | 496 | 158 | 100 | 58 | 34 | 15 | 19 |
| | Transit Trips | 15% | (74) | (24) | (15) | (9) | (5) | (2) | (3) |
| | **Subtotal Existing** | | **422** | **134** | **85** | **49** | **29** | **13** | **16** |
| | **NET TRIPS (PROPOSED-EXISTING)** | | **344** | **(25)** | **6** | **(31)** | **67** | **5** | **62** |

As demonstrated above, the TA estimates that the Project would result in 344 net daily trips, after subtracting 422 existing daily trips from 766 new daily trips. Furthermore, review of the CalEEMod output files demonstrates that the "1200 Cahuenga Project" model reflects these estimated trip rates (see excerpt below) (Appendix A, pp. 94, 122, 152)

| | Average Daily Trip Rate | | |
|---|---|---|---|
| Land Use | Weekday | Saturday | Sunday |
| General Office Building | 344.03 | 344.03 | 344.03 |
| Parking Lot | 0.00 | 0.00 | 0.00 |
| Strip Mall | 0.00 | 0.00 | 0.00 |
| Total | 344.03 | 344.03 | 344.03 |

However, the operational daily trip rates included in the model are underestimated. According to CEQA Guidelines § 15125:

> "An EIR must include a description of the physical environmental conditions in the vicinity of the project, as they exist at the time the notice of preparation is published, or if no notice of

preparation is published, ***at the time environmental analysis is commenced***, from both a local and regional perspective. This environmental setting will normally constitute the baseline physical conditions by which a lead agency determines whether an impact is significant" (emphasis added).[3]

As demonstrated above, the existing conditions of the Project site should be evaluated at the time that a Notice of Intent ("NOI") is released, or when the environmental analysis is commenced. As no record of an NOI exists, the existing conditions should be evaluated based on the date of the earliest environmental analysis. According to the Los Angeles City Planning website, the earliest environmental analyses for this Project were not prepared until 2021.[4] However, according to the IS/MND:

> "The Arshag Dickranian School closed its doors on June 30, 2015. The property was later acquired by the Stratford School, a private school serving students in the pre-kindergarten through fifth grades, and the site reopened as the Stratford School's Melrose Campus for the 2016-2017 school year.
>
> The Stratford School subsequently closed its Melrose campus, and in December 2021 it was announced that the property would be redeveloped as an office complex." (p. 89, 90).

As the Project site became vacant at least 4 years prior to any environmental analysis, the existing conditions of the Project site should be considered as vacant. Thus, the TA incorrectly subtracts trip rates from prior uses of Project site from the total net daily trip rates of the proposed Project. Instead, the TA, as well as the IS/MND's CalEEMod model, should have accounted for zero existing vehicle trips. As such, the IS/MND's model relies on an underestimated operational daily trip rate.

This present an issue, as CalEEMod uses the operational vehicle trip rates to calculate the emissions associated with the operational on-road vehicles.[5] By including underestimated weekday, Saturday, and Sunday operational vehicle trips, the model underestimates the Project's mobile-source operational emissions and should not be relied upon to determine Project significance.

## Greenhouse Gas

### Failure to Adequately Evaluate Greenhouse Gas Impacts

The IS/MND estimates that the Project would generate net annual greenhouse gas ("GHG") emissions of 627.5 metric tons of carbon dioxide equivalents per year ("MT $CO_2e$/year") (see excerpt below) (p. 113, Table 4.9).

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[3] "Title 14. Natural Resources Division 6. Resources Agency Chapter 3. Guidelines for Implementation of the California Environmental Quality Act Article 5. Preliminary Review of Projects and Conduct of Initial Study." CEQA Guidelines, *available at:* https://resources.ca.gov/CNRALegacyFiles/ceqa/docs/FINAL_Text_of_Proposed_Amendemts.pdf, pp. 14.
[4] "Environmental Notices." Los Angeles City Planning, January 2023, *available at:* https://planning.lacity.org/odocument/5b989406-f182-48da-b7ca-a1d0d3446c1c/Publication_Daily_News_MND.htm.
[5] "CalEEMod User's Guide." California Air Pollution Control Officers Association (CAPCOA), May 2021, *available at:* https://www.aqmd.gov/caleemod/user's-guide, p. 36.

| Emission Source | Emissions ($MTCO_2e$) with Regulation[1] |
|---|---|
| Area Source | 0.0 |
| Energy Source | 159.0 |
| Mobile Source | 375.7 |
| Waste | 26.1 |
| Water | 48.3 |
| *Subtotal (Operation)* | 609.2 |
| *Subtotal Construction (averaged over 30 years)* | 18.3 |
| **Total Annual Emissions** | **627.5** |
| *Notes:* [1] *$MTCO_2e$ = metric tons of carbon dioxide equivalents* *Source: MD Acoustics, 2022.* | |

However, the IS/MND does not rely on a quantitative GHG analysis, stating:

> "Although GHG emissions can be quantified, CARB, SCAQMD and the City of Los Angeles have yet to adopt project-level numeric significance thresholds for GHG emissions that would be applicable to the Project […] In the absence of any applicable adopted numeric threshold, the significance of the Project's GHG emissions is evaluated consistent with CEQA Guidelines Section 15064.4(b)(2) by considering whether the Project complies with applicable plans, policies, regulations and requirements adopted to implement a statewide, regional, or local plan for the reduction or mitigation of GHG emissions. This evaluation of consistency with such plans is the sole basis for determining the significance of the Project's GHG-related impacts on the environment" (p. 112).

The IS/MND continues, stating:

> "In conclusion, the Project would be consistent with the CARB's Scoping Plan, SCAG's 2020–2045 RTP/SCS and the City's Green New Deal and, therefore, would neither generate GHG emissions that may have a significant impact on the environment nor conflict with an applicable plan, policy or regulation adopted for the purpose of reducing GHG emissions" (p. 123).

As demonstrated above, the IS/MND relies on consistency with CARB's *Scoping Plan,* SCAG's *RTP/SCS,* and the City's *Green New Deal* to conclude a less-than-significant GHG emissions impact. However, the IS/MND's analysis, as well as the subsequent less-than-significant impact conclusion, is incorrect for four reasons.

(1) The IS/MND's quantitative analysis relies upon a flawed air model;
(2) SWAPE's updated air model indicates a potentially significant GHG impact;
(3) The IS/MND fails to consider performance-based standards under CARB's *Scoping Plan*; and
(4) The IS/MND fails to consider performance-based standards under SCAG's *RTP/SCS*;

### *1) Incorrect and Unsubstantiated Quantitative Analysis of Emissions*

As previously stated, the IS/MND estimates that the Project would generate net annual GHG emissions of 627.5 $MTCO_2e$ (p. 113, Table 4.9). However, the IS/MND's quantitative analysis is unsubstantiated. As previously discussed, when reviewing the Project's CalEEMod models, provided in the AQ & GHG Study, we found that the IS/MND's model relies on underestimated operational vehicle trip rates. As a result, the model underestimates the Project's operational emissions, and the IS/MND's quantitative analysis should not be relied upon to determine Project significance. An EIR should be prepared that adequately assesses the potential GHG impacts that operation of the proposed Project may have on the environment.

### *2) Updated Greenhouse Gas Analysis Indicates a Potentially Significant Impact*

In an effort to more accurately estimate the Project's operational emissions, we prepared an updated CalEEMod model, using the Project-specific information provided by the IS/MND. In our updated model, we included the correct operational daily vehicle trip rate of 766.[6] To quantitatively evaluate the Project's GHG emissions, we applied the SCAQMD 2035 service population efficiency target of 3.0 metric tons of carbon dioxide equivalents per service population per year ("MT $CO_2e$/SP/year"), which was calculated by applying a 40% reduction to the 2020 targets.[7] When applying this threshold, our updated air model indicates a potentially significant GHG impact.

SWAPE's CalEEMod output files disclose the Project's mitigated GHG emissions, which include approximately 549.89 MT $CO_2e$/year of total construction emissions (sum of 2022, 2023, and 2024) and approximately 1,069.97 MT $CO_2e$/year of net annual operational emissions (sum of area-, energy-, mobile-, waste, and water-related emissions).[8] When amortizing the Project's construction-related GHG emissions over a period of 30 years and summing them with the Project's operational GHG emissions, we estimate net annual GHG emissions of approximately 1,088.30 MT $CO_2e$/year. Furthermore, according to CAPCOA's *CEQA & Climate Change* report, a service population ("SP") is defined as "the sum of the number of residents and the number of jobs supported by the project."[9] According to the IS/MND, the project would support 301 employees (p. 191). As the project is not expected to support any residential land uses, we estimate an SP of 301 people. When dividing the Project's total GHG emissions by an SP value of 301 people, we find that the Project would emit approximately 3.62 MT $CO_2e$/SP/year (see table below).[10]

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[6] See Attachment A for updated modeling.

[7] "Minutes for the GHG CEQA Significance Threshold Stakeholder Working Group #15." SCAQMD, September 2010, *available at:* http://www.aqmd.gov/docs/default-source/ceqa/handbook/greenhouse-gases-(ghg)-ceqa-significance-thresholds/year-2008-2009/ghg-meeting-15/ghg-meeting-15-minutes.pdf, p. 2.

[8] See Attachment A for CalEEMod output files.

[9] CAPCOA *(*Jan. 2008) CEQA & Climate Change, p. 71-72, http://www.capcoa.org/wp-content/uploads/2012/03/CAPCOA-White-Paper.pdf.

[10] Calculated: (1,088.30 MT $CO_2e$/year) / (301 service population) = (3.62 MT $CO_2e$/SP/year).

| SWAPE Annual Greenhouse Gas Emissions | |
|---|---|
| **Project Phase** | **Proposed Project** |
| *Total Construction* | *549.89* |
| Construction (amortized over 30 years) | 18.33 |
| *Area* | *0.01* |
| *Energy* | *158.97* |
| *Mobile* | *836.55* |
| *Waste* | *26.14* |
| *Water* | *48.31* |
| Annual Operational | 1,069.97 |
| Total Net Annual GHG Emissions (MT $CO_2$e/year) | 1,088.30 |
| Service Population | 301 |
| Service Population Efficiency (MT $CO_2$e/SP/year) | 3.62 |
| **SCAQMD Threshold** | **3.0** |
| *Exceeds?* | ***Yes*** |

As demonstrated above, the Project's service population efficiency value, as estimated by the SWAPE's net annual GHG emissions and SP, exceeds the SCAQMD 2035 efficiency target of 3.0 MT $CO_2$e/SP/year, thus resulting in a potentially significant impact. As such, an EIR should be prepared, including an updated GHG analysis and incorporating additional mitigation measures to reduce the Project's GHG emissions to less-than-significant levels.

### *3) Failure to Demonstrate Consistency with CARB's 2017 Scoping Plan*

The IS/MND concludes that the Project would be consistent with CARB's 2017 Climate Change Scoping Plan (p. 123). However, this is incorrect, as the IS/MND fails to consider the following performance-based measures proposed by CARB.

#### ***i. Passenger & Light Duty VMT Per Capita Benchmarks per SB 375***

In reaching the State's long-term GHG emission reduction goals, CARB's 2017 *Scoping Plan* explicitly cites to SB 375 and the VMT reductions anticipated under the implementation of Sustainable Community Strategies.[11] CARB has identified the population and daily VMT from passenger autos and light-duty vehicles at the state and county level for each year between 2010 to 2050 under a "baseline scenario" that includes "current projections of VMT included in the existing Regional Transportation Plans/Sustainable Communities Strategies (RTP/SCSs) adopted by the State's 18 Metropolitan Planning Organizations (MPOs) pursuant to SB 375 as of 2015."[12] By dividing the projected daily VMT by the

[11] "California's 2017 Climate Change Scoping Plan." CARB, November 2017, *available at*: https://ww3.arb.ca.gov/cc/scopingplan/scoping_plan_2017.pdf, p. 25, 98, 101-103.
[12] "Supporting Calculations for 2017 Scoping Plan-Identified VMT Reductions," California Air Resources Board (CARB), January 2019, *available at*: https://ww2.arb.ca.gov/resources/documents/carb-2017-scoping-plan-

population, we calculated the daily VMT per capita for each year at the state and county level for 2010 (baseline year), 2024 (Project operational year), and 2030 (target years under SB 32) (see table below).

| 2017 Scoping Plan Daily VMT Per Capita | | | |
|---|---|---|---|
| Year | Population | LDV VMT Baseline | VMT Per Capita |
| **Los Angeles County** | | | |
| **2010** | 9,838,771 | 216,979,221.64 | 22.05 |
| **2024** | 10,627,846 | 219,237,756.72 | 20.63 |
| **2030** | 10,868,614 | 215,539,586.12 | 19.83 |
| **State** | | | |
| **2010** | 37,335,085 | 836,463,980.46 | 22.40 |
| **2024** | 41,994,283 | 926,776,780.89 | 22.07 |
| **2030** | 43,939,250 | 957,178,153.19 | 21.78 |

As the IS/MND fails to evaluate the Project's consistency with the CARB 2017 *Scoping Plan* performance-based daily VMT per capita projections, the IS/MND's claim that the proposed Project would not conflict with the CARB 2017 *Scoping Plan* is unsupported. An EIR should be prepared for the proposed Project to provide additional information and analysis to conclude less-than-significant GHG impacts.

### *4) Failure to Consider Performance-based Standards under SCAG's RTP/SCS*

As previously discussed, the IS/MND concludes that the Project would be consistent with SCAG's *RTP/SCS* (p. 123). However, the IS/MND fails to consider whether or not the Project meets any of the specific performance-based goals underlying SCAG's *RTP/SCS* and SB 375, such as: i) per capita GHG emission targets, or ii) daily vehicles miles traveled ("VMT") per capita benchmarks.

#### ***i. SB 375 Per Capita GHG Emission Goals***

SB 375 was signed into law in September 2008 to enhance the state's ability to reach AB 32 goals by directing CARB to develop regional 2020 and 2035 GHG emission reduction targets for passenger vehicles (autos and light-duty trucks). In March 2018, CARB adopted updated regional targets requiring a 19 percent decrease in VMT for the SCAG region by 2035. This goal is reflected in SCAG's 2020 RTP/SCS Program Environmental Impact Report ("PEIR"), in which the 2020 RTP/SCS PEIR updates the per capita emissions to 18.8 lbs/day in 2035 (see excerpt below).[13]

identified-vmt-reductions-and-relationship-state-climate; *see also:* https://ww2.arb.ca.gov/sites/default/files/2019-01/sp_mss_vmt_calculations_jan19_0.xlsx.

[13] "Connect SoCal Certified Final Program Environmental Impact Report." SCAG, May 2020, *available at*: https://scag.ca.gov/sites/main/files/file-attachments/fpeir_connectsocal_complete.pdf?1607981618, p. 3.8-74.

**Table 3.8-10**
**SB 375 Analysis**

| | 2005 (Baseline) | 2020 (Plan) | 2035 (Plan) |
|---|---|---|---|
| Resident population (per 1,000) | 17,161 | 19,194 | 21,110 |
| CO2 emissions (per 1,000 tons) | 204.0/a/ | 204.5/b/ | 198.6/b/ |
| Per capita emissions (pounds/day) | 23.8 | 21.3 | 18.8 |
| % difference from Plan (2020) to Baseline (2005) | | | –8% |
| % difference from Plan (2035) to Baseline (2005) | | | –19%/c/ |

*Note:*
*/a/ Based on EMFAC2007*
*/b/Based on EMFAC2014 and SCAG modeling, 2019.*
*/c/ Includes off-model adjustments for 2035 and 2045*
*Source: SCAG modeling, 2019.*
*http://www.scag.ca.gov/committees/CommitteeDocLibrary/jointRCPC110515fullagn.pdf*

As the IS/MND fails to evaluate the Project's consistency with the SCAG's per capita emissions, the IS/MND's claim that the proposed Project would be consistent with SCAG's *RTP/SCS* is unsupported. An EIR should be prepared for the proposed Project to provide additional information and analysis to conclude less-than-significant GHG impacts.

***ii. SB 375 RTP/SCS Daily VMT Per Capita Target***

Under the SCAG's 2020 *RTP/SCS*, daily VMT per capita in the SCAG region should decrease from 23.2 VMT in 2016 to 20.7 VMT by 2045.[14] Daily VMT per capita in Los Angeles County should decrease from 22.2 to 19.2 VMT during that same period.[15] Here, however, the IS/MND fails to consider any of the above-mentioned performance-based VMT targets. As the IS/MND fails to evaluate the Project's consistency with the SCAG's performance-based daily VMT per capita projections, the IS/MND's claim that the proposed Project would not conflict with SCAG's *RTP/SCS* is unsupported. An EIR should be prepared to provide additional analysis to adequately support the less-than-significant GHG impact conclusion.

## Mitigation

### Feasible Mitigation Measures Available to Reduce Emissions

Our analysis demonstrates that the Project would result in potentially significant GHG impacts that should be mitigated further. In an effort to reduce the Project's emissions, we recommend consideration of SCAG's 2020 *RTP/SCS* PEIR's Greenhouse Gas Project Level Mitigation Measures ("PMM-GHG-1"), as described below: [16]

[14] "Connect SoCal." SCAG, September 2020, *available at*: https://scag.ca.gov/sites/main/files/file-attachments/0903fconnectsocal-plan_0.pdf?1606001176, pp. 138.
[15] "Connect SoCal." SCAG, September 2020, *available at*: https://scag.ca.gov/sites/main/files/file-attachments/0903fconnectsocal-plan_0.pdf?1606001176, pp. 138.
[16] "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_connectsocal_addendum_4_mitigationmeasures.pdf?1606004420, p. 4.0-2 – 4.0-10; 4.0-19 –

| **Greenhouse Gas Project Level Mitigation Measures – PMM-GHG-1**<br>In accordance with provisions of sections 15091(a)(2) and 15126.4(a)(1)(B) of the *State CEQA Guidelines*, a Lead Agency for a project can and should consider mitigation measures to reduce substantial adverse effects related to violating air quality standards. Such measures may include the following or other comparable measures identified by the Lead Agency: |
| --- |
| b) Reduce emissions resulting from projects through implementation of project features, project design, or other measures, such as those described in Appendix F of the State CEQA Guidelines. |
| c) Include off-site measures to mitigate a project's emissions. |
| d) Measures that consider incorporation of Best Available Control Technology (BACT) during design, construction and operation of projects to minimize GHG emissions, including but not limited to:<br>i. Use energy and fuel-efficient vehicles and equipment;<br>ii. Deployment of zero- and/or near zero emission technologies;<br>iii. Use lighting systems that are energy efficient, such as LED technology;<br>iv. Use the minimum feasible amount of GHG-emitting construction materials;<br>v. Use cement blended with the maximum feasible amount of flash or other materials that reduce GHG emissions from cement production;<br>vi. Incorporate design measures to reduce GHG emissions from solid waste management through encouraging solid waste recycling and reuse;<br>vii. Incorporate design measures to reduce energy consumption and increase use of renewable energy;<br>viii. Incorporate design measures to reduce water consumption;<br>ix. Use lighter-colored pavement where feasible;<br>x. Recycle construction debris to maximum extent feasible;<br>xi. Plant shade trees in or near construction projects where feasible; and<br>xii. Solicit bids that include concepts listed above. |
| e) Measures that encourage transit use, carpooling, bike-share and car-share programs, active transportation, and parking strategies, including, but not limited to the following:<br>i. Promote transit-active transportation coordinated strategies;<br>ii. Increase bicycle carrying capacity on transit and rail vehicles;<br>iii. Improve or increase access to transit;<br>iv. Increase access to common goods and services, such as groceries, schools, and day care;<br>v. Incorporate affordable housing into the project;<br>vi. Incorporate the neighborhood electric vehicle network;<br>vii. Orient the project toward transit, bicycle and pedestrian facilities;<br>viii. Improve pedestrian or bicycle networks, or transit service;<br>ix. Provide traffic calming measures;<br>x. Provide bicycle parking;<br>xi. Limit or eliminate park supply;<br>xii. Unbundle parking costs;<br>xiii. Provide parking cash-out programs;<br>xiv. Implement or provide access to commute reduction program; |

4.0-23; See also: "Certified Final Connect SoCal Program Environmental Impact Report." Southern California Association of Governments (SCAG), May 2020, *available at:* https://scag.ca.gov/peir.

| |
|---|
| f) Incorporate bicycle and pedestrian facilities into project designs, maintaining these facilities, and providing amenities incentivizing their use; and planning for and building local bicycle projects that connect with the regional network; |
| g) Improving transit access to rail and bus routes by incentives for construction and transit facilities within developments, and/or providing dedicated shuttle service to transit stations; and |
| h) Adopting employer trip reduction measures to reduce employee trips such as vanpool and carpool programs, providing end-of-trip facilities, and telecommuting programs including but not limited to measures that:<br>i. Provide car-sharing, bike sharing, and ride-sharing programs;<br>ii. Provide transit passes;<br>iii. Shift single occupancy vehicle trips to carpooling or vanpooling, for example providing ride-matching services;<br>iv. Provide incentives or subsidies that increase that use of modes other than single-occupancy vehicle;<br>v. Provide on-site amenities at places of work, such as priority parking for carpools and vanpools, secure bike parking, and showers and locker rooms;<br>vi. Provide employee transportation coordinators at employment sites;<br>vii. Provide a guaranteed ride home service to users of non-auto modes. |
| i) Designate a percentage of parking spaces for ride-sharing vehicles or high-occupancy vehicles, and provide adequate passenger loading and unloading for those vehicles; |
| j) Land use siting and design measures that reduce GHG emissions, including:<br>i. Developing on infill and brownfields sites;<br>ii. Building compact and mixed-use developments near transit;<br>iii. Retaining on-site mature trees and vegetation, and planting new canopy trees;<br>iv. Measures that increase vehicle efficiency, encourage use of zero and low emissions vehicles, or reduce the carbon content of fuels, including constructing or encouraging construction of electric vehicle charging stations or neighborhood electric vehicle networks, or charging for electric bicycles; and<br>v. Measures to reduce GHG emissions from solid waste management through encouraging solid waste recycling and reuse. |
| k) Consult the SCAG Environmental Justice Toolbox for potential measures to address impacts to low-income and/or minority communities. The measures provided above are also intended to be applied in low income and minority communities as applicable and feasible. |
| l) Require at least five percent of all vehicle parking spaces include electric vehicle charging stations, or at a minimum, require the appropriate infrastructure to facilitate sufficient electric charging for passenger vehicles and trucks to plug-in. |
| m) Encourage telecommuting and alternative work schedules, such as:<br>i. Staggered starting times<br>ii. Flexible schedules<br>iii. Compressed work weeks |
| n) Implement commute trip reduction marketing, such as:<br>i. New employee orientation of trip reduction and alternative mode options<br>ii. Event promotions<br>iii. Publications |
| o) Implement preferential parking permit program |
| p) Implement school pool and bus programs |

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 and operation.

Furthermore, as it is policy of the State that eligible renewable energy resources and zero-carbon resources supply 100% of retail sales of electricity to California end-use customers by December 31, 2045, we emphasize the applicability of incorporating solar power system into the Project design. Until the feasibility of incorporating on-site renewable energy production is considered, the Project should not be approved.

An EIR should be prepared to include all feasible mitigation measures, as well as include an updated GHG analysis, to ensure that the necessary mitigation measures are implemented to reduce emissions to below thresholds. The EIR should also demonstrate a commitment to the implementation of these measures prior to Project approval, to ensure that the Project's 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.

Sincerely,

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

Paul E. Rosenfeld, Ph.D.

Attachment A: Updated CalEEMod Output Files
Attachment B: Matt Hagemann CV
Attachment C: Paul Rosenfeld CV

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied**

# 1200 Cahuenga Project

**Los Angeles-South Coast County, Annual**

## 1.0 Project Characteristics

### 1.1 Land Usage

| Land Uses | Size | Metric | Lot Acreage | Floor Surface Area | Population |
|---|---|---|---|---|---|
| General Office Building | 55.31 | 1000sqft | 1.22 | 55,314.00 | 0 |
| Parking Lot | 156.00 | Space | 0.00 | 62,400.00 | 0 |
| Strip Mall | 0.50 | 1000sqft | 0.01 | 500.00 | 0 |

### 1.2 Other Project Characteristics

| | | | | | |
|---|---|---|---|---|---|
| **Urbanization** | Urban | **Wind Speed (m/s)** | 2.2 | **Precipitation Freq (Days)** | 33 |
| **Climate Zone** | 11 | | | **Operational Year** | 2024 |
| **Utility Company** | Southern California Edison | | | | |
| **CO2 Intensity (lb/MWhr)** | 390.98 | **CH4 Intensity (lb/MWhr)** | 0.033 | **N2O Intensity (lb/MWhr)** | 0.004 |

### 1.3 User Entered Comments & Non-Default Data

Project Characteristics - Consistent with the IS/MND's model.

Land Use - Consistent with the IS/MND's model.

Construction Phase - Consistent with the IS/MND's model.

Trips and VMT - See SWAPE's comment on "Underestimated Number of Operational Vehicle Trips"

Grading - Consistent with the IS/MND's model.

Vehicle Trips - See SWAPE's comment on "Underestimated Number of Operational Vehicle Trips".

Construction Off-road Equipment Mitigation - Consistent with the IS/MND's model.

Demolition -

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied**

| Table Name | Column Name | Default Value | New Value |
|---|---|---|---|
| tblConstructionPhase | NumDays | 10.00 | 17.00 |
| tblConstructionPhase | NumDays | 200.00 | 336.00 |
| tblConstructionPhase | NumDays | 20.00 | 34.00 |
| tblConstructionPhase | NumDays | 4.00 | 7.00 |
| tblConstructionPhase | NumDays | 10.00 | 17.00 |
| tblGrading | MaterialExported | 0.00 | 12,678.00 |
| tblLandUse | LandUseSquareFeet | 55,310.00 | 55,314.00 |
| tblLandUse | LotAcreage | 1.27 | 1.22 |
| tblLandUse | LotAcreage | 1.40 | 0.00 |
| tblVehicleTrips | ST_TR | 2.21 | 13.85 |
| tblVehicleTrips | ST_TR | 42.04 | 0.00 |
| tblVehicleTrips | SU_TR | 0.70 | 13.85 |
| tblVehicleTrips | SU_TR | 20.43 | 0.00 |
| tblVehicleTrips | WD_TR | 9.74 | 13.85 |
| tblVehicleTrips | WD_TR | 44.32 | 0.00 |

## 2.0 Emissions Summary

## 2.1 Overall Construction

**Unmitigated Construction**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Year | tons/yr | | | | | | | | | | MT/yr | | | | | |
| 2022 | 0.0814 | 0.8140 | 0.6521 | 1.7600e-003 | 0.0797 | 0.0318 | 0.1115 | 0.0242 | 0.0301 | 0.0543 | 0.0000 | 159.0582 | 159.0582 | 0.0220 | 0.0103 | 162.6738 |
| 2023 | 0.2190 | 1.6363 | 1.8721 | 3.8700e-003 | 0.0783 | 0.0678 | 0.1460 | 0.0211 | 0.0654 | 0.0865 | 0.0000 | 331.5067 | 331.5067 | 0.0429 | 7.7600e-003 | 334.8926 |
| 2024 | 0.2983 | 0.2396 | 0.3093 | 6.0000e-004 | 0.0111 | 9.7800e-003 | 0.0209 | 2.9800e-003 | 9.3500e-003 | 0.0123 | 0.0000 | 51.8509 | 51.8509 | 8.1800e-003 | 9.1000e-004 | 52.3279 |
| **Maximum** | **0.2983** | **1.6363** | **1.8721** | **3.8700e-003** | **0.0797** | **0.0678** | **0.1460** | **0.0242** | **0.0654** | **0.0865** | **0.0000** | **331.5067** | **331.5067** | **0.0429** | **0.0103** | **334.8926** |

**Mitigated Construction**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Year | tons/yr | | | | | | | | | | MT/yr | | | | | |
| 2022 | 0.0814 | 0.8140 | 0.6521 | 1.7600e-003 | 0.0797 | 0.0318 | 0.1115 | 0.0242 | 0.0301 | 0.0543 | 0.0000 | 159.0581 | 159.0581 | 0.0220 | 0.0103 | 162.6737 |
| 2023 | 0.2190 | 1.6363 | 1.8721 | 3.8700e-003 | 0.0783 | 0.0678 | 0.1460 | 0.0211 | 0.0654 | 0.0865 | 0.0000 | 331.5064 | 331.5064 | 0.0429 | 7.7600e-003 | 334.8923 |
| 2024 | 0.2983 | 0.2396 | 0.3093 | 6.0000e-004 | 0.0111 | 9.7800e-003 | 0.0209 | 2.9800e-003 | 9.3500e-003 | 0.0123 | 0.0000 | 51.8509 | 51.8509 | 8.1800e-003 | 9.1000e-004 | 52.3278 |
| **Maximum** | **0.2983** | **1.6363** | **1.8721** | **3.8700e-003** | **0.0797** | **0.0678** | **0.1460** | **0.0242** | **0.0654** | **0.0865** | **0.0000** | **331.5064** | **331.5064** | **0.0429** | **0.0103** | **334.8923** |

## EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio-CO2 | Total CO2 | CH4 | N20 | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Percent Reduction | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

| Quarter | Start Date | End Date | Maximum Unmitigated ROG + NOX (tons/quarter) | Maximum Mitigated ROG + NOX (tons/quarter) |
|---|---|---|---|---|
| 1 | 9-1-2022 | 11-30-2022 | 0.7112 | 0.7112 |
| 2 | 12-1-2022 | 2-28-2023 | 0.4718 | 0.4718 |
| 3 | 3-1-2023 | 5-31-2023 | 0.4680 | 0.4680 |
| 4 | 6-1-2023 | 8-31-2023 | 0.4674 | 0.4674 |
| 5 | 9-1-2023 | 11-30-2023 | 0.4635 | 0.4635 |
| 6 | 12-1-2023 | 2-29-2024 | 0.3978 | 0.3978 |
| 7 | 3-1-2024 | 5-31-2024 | 0.2820 | 0.2820 |
| | | Highest | 0.7112 | 0.7112 |

## 2.2 Overall Operational

### Unmitigated Operational

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Area | 0.2327 | 2.0000e-005 | 2.7000e-003 | 0.0000 | | 1.0000e-005 | 1.0000e-005 | | 1.0000e-005 | 1.0000e-005 | 0.0000 | 5.2600e-003 | 5.2600e-003 | 1.0000e-005 | 0.0000 | 5.6000e-003 |
| Energy | 3.0800e-003 | 0.0280 | 0.0235 | 1.7000e-004 | | 2.1300e-003 | 2.1300e-003 | | 2.1300e-003 | 2.1300e-003 | 0.0000 | 158.1295 | 158.1295 | 0.0114 | 1.8600e-003 | 158.9692 |
| Mobile | 0.3938 | 0.4464 | 4.0499 | 8.7700e-003 | 0.9272 | 6.4600e-003 | 0.9336 | 0.2474 | 6.0000e-003 | 0.2534 | 0.0000 | 824.6739 | 824.6739 | 0.0563 | 0.0355 | 836.6698 |
| Waste | | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 10.5494 | 0.0000 | 10.5494 | 0.6235 | 0.0000 | 26.1358 |
| Water | | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 3.1305 | 34.7022 | 37.8327 | 0.3245 | 7.9500e-003 | 48.3125 |
| **Total** | **0.6295** | **0.4744** | **4.0761** | **8.9400e-003** | **0.9272** | **8.6000e-003** | **0.9358** | **0.2474** | **8.1400e-003** | **0.2555** | **13.6799** | **1,017.5109** | **1,031.1908** | **1.0156** | **0.0453** | **1,070.0928** |

## 2.2 Overall Operational

**Mitigated Operational**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Area | 0.2327 | 2.0000e-005 | 2.7000e-003 | 0.0000 | | 1.0000e-005 | 1.0000e-005 | | 1.0000e-005 | 1.0000e-005 | 0.0000 | 5.2600e-003 | 5.2600e-003 | 1.0000e-005 | 0.0000 | 5.6000e-003 |
| Energy | 3.0800e-003 | 0.0280 | 0.0235 | 1.7000e-004 | | 2.1300e-003 | 2.1300e-003 | | 2.1300e-003 | 2.1300e-003 | 0.0000 | 158.1295 | 158.1295 | 0.0114 | 1.8600e-003 | 158.9692 |
| Mobile | 0.3938 | 0.4464 | 4.0499 | 8.7700e-003 | 0.9272 | 6.4600e-003 | 0.9336 | 0.2474 | 6.0000e-003 | 0.2534 | 0.0000 | 824.6739 | 824.6739 | 0.0563 | 0.0355 | 836.6698 |
| Waste | | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 10.5494 | 0.0000 | 10.5494 | 0.6235 | 0.0000 | 26.1358 |
| Water | | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 3.1305 | 34.7022 | 37.8327 | 0.3245 | 7.9500e-003 | 48.3125 |
| **Total** | **0.6295** | **0.4744** | **4.0761** | **8.9400e-003** | **0.9272** | **8.6000e-003** | **0.9358** | **0.2474** | **8.1400e-003** | **0.2555** | **13.6799** | **1,017.5109** | **1,031.1908** | **1.0156** | **0.0453** | **1,070.0928** |

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio-CO2 | Total CO2 | CH4 | N20 | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Percent Reduction** | **0.00** | **0.00** | **0.00** | **0.00** | **0.00** | **0.00** | **0.00** | **0.00** | **0.00** | **0.00** | **0.00** | **0.00** | **0.00** | **0.00** | **0.00** | **0.00** |

# 3.0 Construction Detail

**Construction Phase**

| Phase Number | Phase Name | Phase Type | Start Date | End Date | Num Days Week | Num Days | Phase Description |
|---|---|---|---|---|---|---|---|
| 1 | Demolition | Demolition | 9/1/2022 | 10/18/2022 | 5 | 34 | |
| 2 | Grading | Grading | 10/19/2022 | 10/27/2022 | 5 | 7 | |
| 3 | Building Construction | Building Construction | 10/28/2022 | 2/9/2024 | 5 | 336 | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 4 | Paving | Paving | 2/10/2024 | 3/5/2024 | 5 | 17 | |
| 5 | Architectural Coating | Architectural Coating | 3/6/2024 | 3/28/2024 | 5 | 17 | |

**Acres of Grading (Site Preparation Phase): 0**

**Acres of Grading (Grading Phase): 7**

**Acres of Paving: 0**

**Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 83,721; Non-Residential Outdoor: 27,907; Striped Parking Area: 3,744 (Architectural Coating – sqft)**

## OffRoad Equipment

| Phase Name | Offroad Equipment Type | Amount | Usage Hours | Horse Power | Load Factor |
|---|---|---|---|---|---|
| Demolition | Concrete/Industrial Saws | 1 | 8.00 | 81 | 0.73 |
| Demolition | Rubber Tired Dozers | 1 | 8.00 | 247 | 0.40 |
| Demolition | Tractors/Loaders/Backhoes | 3 | 8.00 | 97 | 0.37 |
| Grading | Graders | 1 | 8.00 | 187 | 0.41 |
| Grading | Rubber Tired Dozers | 1 | 8.00 | 247 | 0.40 |
| Grading | Tractors/Loaders/Backhoes | 2 | 7.00 | 97 | 0.37 |
| Building Construction | Cranes | 1 | 6.00 | 231 | 0.29 |
| Building Construction | Forklifts | 1 | 6.00 | 89 | 0.20 |
| Building Construction | Generator Sets | 1 | 8.00 | 84 | 0.74 |
| Building Construction | Tractors/Loaders/Backhoes | 1 | 6.00 | 97 | 0.37 |
| Building Construction | Welders | 3 | 8.00 | 46 | 0.45 |
| Paving | Cement and Mortar Mixers | 1 | 6.00 | 9 | 0.56 |
| Paving | Pavers | 1 | 6.00 | 130 | 0.42 |
| Paving | Paving Equipment | 1 | 8.00 | 132 | 0.36 |
| Paving | Rollers | 1 | 7.00 | 80 | 0.38 |
| Paving | Tractors/Loaders/Backhoes | 1 | 8.00 | 97 | 0.37 |
| Architectural Coating | Air Compressors | 1 | 6.00 | 78 | 0.48 |

**Trips and VMT**

| Phase Name | Offroad Equipment Count | Worker Trip Number | Vendor Trip Number | Hauling Trip Number | Worker Trip Length | Vendor Trip Length | Hauling Trip Length | Worker Vehicle Class | Vendor Vehicle Class | Hauling Vehicle Class |
|---|---|---|---|---|---|---|---|---|---|---|
| Demolition | 5 | 13.00 | 0.00 | 205.00 | 14.70 | 6.90 | 20.00 | LD_Mix | HDT_Mix | HHDT |
| Grading | 4 | 10.00 | 0.00 | 1,585.00 | 14.70 | 6.90 | 20.00 | LD_Mix | HDT_Mix | HHDT |
| Building Construction | 7 | 44.00 | 19.00 | 0.00 | 14.70 | 6.90 | 20.00 | LD_Mix | HDT_Mix | HHDT |
| Paving | 5 | 13.00 | 0.00 | 0.00 | 14.70 | 6.90 | 20.00 | LD_Mix | HDT_Mix | HHDT |
| Architectural Coating | 1 | 9.00 | 0.00 | 0.00 | 14.70 | 6.90 | 20.00 | LD_Mix | HDT_Mix | HHDT |

## 3.1 Mitigation Measures Construction

Water Exposed Area

## 3.2 Demolition - 2022

**Unmitigated Construction On-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Fugitive Dust | | | | | 0.0222 | 0.0000 | 0.0222 | 3.3500e-003 | 0.0000 | 3.3500e-003 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Off-Road | 0.0287 | 0.2826 | 0.2373 | 4.1000e-004 | | 0.0142 | 0.0142 | | 0.0133 | 0.0133 | 0.0000 | 35.8321 | 35.8321 | 9.1300e-003 | 0.0000 | 36.0603 |
| **Total** | **0.0287** | **0.2826** | **0.2373** | **4.1000e-004** | **0.0222** | **0.0142** | **0.0364** | **3.3500e-003** | **0.0133** | **0.0167** | **0.0000** | **35.8321** | **35.8321** | **9.1300e-003** | **0.0000** | **36.0603** |

## 3.2 Demolition - 2022

**Unmitigated Construction Off-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Hauling | 4.7000e-004 | 0.0181 | 4.0400e-003 | 6.0000e-005 | 1.7600e-003 | 1.3000e-004 | 1.8900e-003 | 4.8000e-004 | 1.2000e-004 | 6.1000e-004 | 0.0000 | 6.3311 | 6.3311 | 3.4000e-004 | 1.0000e-003 | 6.6388 |
| Vendor | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Worker | 7.6000e-004 | 6.3000e-004 | 8.2000e-003 | 2.0000e-005 | 2.4200e-003 | 2.0000e-005 | 2.4400e-003 | 6.4000e-004 | 1.0000e-005 | 6.6000e-004 | 0.0000 | 2.0046 | 2.0046 | 6.0000e-005 | 5.0000e-005 | 2.0223 |
| **Total** | **1.2300e-003** | **0.0188** | **0.0122** | **8.0000e-005** | **4.1800e-003** | **1.5000e-004** | **4.3300e-003** | **1.1200e-003** | **1.3000e-004** | **1.2700e-003** | **0.0000** | **8.3357** | **8.3357** | **4.0000e-004** | **1.0500e-003** | **8.6611** |

**Mitigated Construction On-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Fugitive Dust | | | | | 0.0222 | 0.0000 | 0.0222 | 3.3500e-003 | 0.0000 | 3.3500e-003 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Off-Road | 0.0287 | 0.2826 | 0.2373 | 4.1000e-004 | | 0.0142 | 0.0142 | | 0.0133 | 0.0133 | 0.0000 | 35.8320 | 35.8320 | 9.1300e-003 | 0.0000 | 36.0603 |
| **Total** | **0.0287** | **0.2826** | **0.2373** | **4.1000e-004** | **0.0222** | **0.0142** | **0.0364** | **3.3500e-003** | **0.0133** | **0.0167** | **0.0000** | **35.8320** | **35.8320** | **9.1300e-003** | **0.0000** | **36.0603** |

## 3.2 Demolition - 2022

**Mitigated Construction Off-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Hauling | 4.7000e-004 | 0.0181 | 4.0400e-003 | 6.0000e-005 | 1.7600e-003 | 1.3000e-004 | 1.8900e-003 | 4.8000e-004 | 1.2000e-004 | 6.1000e-004 | 0.0000 | 6.3311 | 6.3311 | 3.4000e-004 | 1.0000e-003 | 6.6388 |
| Vendor | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Worker | 7.6000e-004 | 6.3000e-004 | 8.2000e-003 | 2.0000e-005 | 2.4200e-003 | 2.0000e-005 | 2.4400e-003 | 6.4000e-004 | 1.0000e-005 | 6.6000e-004 | 0.0000 | 2.0046 | 2.0046 | 6.0000e-005 | 5.0000e-005 | 2.0223 |
| **Total** | **1.2300e-003** | **0.0188** | **0.0122** | **8.0000e-005** | **4.1800e-003** | **1.5000e-004** | **4.3300e-003** | **1.1200e-003** | **1.3000e-004** | **1.2700e-003** | **0.0000** | **8.3357** | **8.3357** | **4.0000e-004** | **1.0500e-003** | **8.6611** |

## 3.3 Grading - 2022

**Unmitigated Construction On-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Fugitive Dust | | | | | 0.0255 | 0.0000 | 0.0255 | 0.0121 | 0.0000 | 0.0121 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Off-Road | 5.3900e-003 | 0.0594 | 0.0323 | 7.0000e-005 | | 2.6000e-003 | 2.6000e-003 | | 2.3900e-003 | 2.3900e-003 | 0.0000 | 6.3360 | 6.3360 | 2.0500e-003 | 0.0000 | 6.3872 |
| **Total** | **5.3900e-003** | **0.0594** | **0.0323** | **7.0000e-005** | **0.0255** | **2.6000e-003** | **0.0281** | **0.0121** | **2.3900e-003** | **0.0145** | **0.0000** | **6.3360** | **6.3360** | **2.0500e-003** | **0.0000** | **6.3872** |

## 3.3 Grading - 2022

**Unmitigated Construction Off-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Hauling | 3.6500e-003 | 0.1402 | 0.0313 | 4.9000e-004 | 0.0136 | 9.9000e-004 | 0.0146 | 3.7500e-003 | 9.5000e-004 | 4.6900e-003 | 0.0000 | 48.9500 | 48.9500 | 2.6000e-003 | 7.7700e-003 | 51.3294 |
| Vendor | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Worker | 1.2000e-004 | 1.0000e-004 | 1.3000e-003 | 0.0000 | 3.8000e-004 | 0.0000 | 3.9000e-004 | 1.0000e-004 | 0.0000 | 1.0000e-004 | 0.0000 | 0.3175 | 0.3175 | 1.0000e-005 | 1.0000e-005 | 0.3203 |
| **Total** | **3.7700e-003** | **0.1403** | **0.0326** | **4.9000e-004** | **0.0140** | **9.9000e-004** | **0.0150** | **3.8500e-003** | **9.5000e-004** | **4.7900e-003** | **0.0000** | **49.2674** | **49.2674** | **2.6100e-003** | **7.7800e-003** | **51.6497** |

**Mitigated Construction On-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Fugitive Dust | | | | | 0.0255 | 0.0000 | 0.0255 | 0.0121 | 0.0000 | 0.0121 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Off-Road | 5.3900e-003 | 0.0594 | 0.0323 | 7.0000e-005 | | 2.6000e-003 | 2.6000e-003 | | 2.3900e-003 | 2.3900e-003 | 0.0000 | 6.3359 | 6.3359 | 2.0500e-003 | 0.0000 | 6.3872 |
| **Total** | **5.3900e-003** | **0.0594** | **0.0323** | **7.0000e-005** | **0.0255** | **2.6000e-003** | **0.0281** | **0.0121** | **2.3900e-003** | **0.0145** | **0.0000** | **6.3359** | **6.3359** | **2.0500e-003** | **0.0000** | **6.3872** |

## 3.3 Grading - 2022

**Mitigated Construction Off-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Hauling | 3.6500e-003 | 0.1402 | 0.0313 | 4.9000e-004 | 0.0136 | 9.9000e-004 | 0.0146 | 3.7500e-003 | 9.5000e-004 | 4.6900e-003 | 0.0000 | 48.9500 | 48.9500 | 2.6000e-003 | 7.7700e-003 | 51.3294 |
| Vendor | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Worker | 1.2000e-004 | 1.0000e-004 | 1.3000e-003 | 0.0000 | 3.8000e-004 | 0.0000 | 3.9000e-004 | 1.0000e-004 | 0.0000 | 1.0000e-004 | 0.0000 | 0.3175 | 0.3175 | 1.0000e-005 | 1.0000e-005 | 0.3203 |
| **Total** | **3.7700e-003** | **0.1403** | **0.0326** | **4.9000e-004** | **0.0140** | **9.9000e-004** | **0.0150** | **3.8500e-003** | **9.5000e-004** | **4.7900e-003** | **0.0000** | **49.2674** | **49.2674** | **2.6100e-003** | **7.7800e-003** | **51.6497** |

## 3.4 Building Construction - 2022

**Unmitigated Construction On-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Off-Road | 0.0379 | 0.2876 | 0.2927 | 5.1000e-004 | | 0.0135 | 0.0135 | | 0.0131 | 0.0131 | 0.0000 | 41.7627 | 41.7627 | 7.2700e-003 | 0.0000 | 41.9445 |
| **Total** | **0.0379** | **0.2876** | **0.2927** | **5.1000e-004** | | **0.0135** | **0.0135** | | **0.0131** | **0.0131** | **0.0000** | **41.7627** | **41.7627** | **7.2700e-003** | **0.0000** | **41.9445** |

## 3.4 Building Construction - 2022

**Unmitigated Construction Off-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Hauling | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Vendor | 8.5000e-004 | 0.0225 | 7.4500e-003 | 9.0000e-005 | 2.7500e-003 | 2.0000e-004 | 2.9600e-003 | 7.9000e-004 | 2.0000e-004 | 9.9000e-004 | 0.0000 | 8.3449 | 8.3449 | 2.8000e-004 | 1.2000e-003 | 8.7105 |
| Worker | 3.4700e-003 | 2.8900e-003 | 0.0376 | 1.0000e-004 | 0.0111 | 7.0000e-005 | 0.0112 | 2.9500e-003 | 7.0000e-005 | 3.0100e-003 | 0.0000 | 9.1796 | 9.1796 | 2.6000e-004 | 2.5000e-004 | 9.2604 |
| **Total** | **4.3200e-003** | **0.0254** | **0.0450** | **1.9000e-004** | **0.0138** | **2.7000e-004** | **0.0141** | **3.7400e-003** | **2.7000e-004** | **4.0000e-003** | **0.0000** | **17.5244** | **17.5244** | **5.4000e-004** | **1.4500e-003** | **17.9709** |

**Mitigated Construction On-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Off-Road | 0.0379 | 0.2876 | 0.2927 | 5.1000e-004 | | 0.0135 | 0.0135 | | 0.0131 | 0.0131 | 0.0000 | 41.7626 | 41.7626 | 7.2700e-003 | 0.0000 | 41.9445 |
| **Total** | **0.0379** | **0.2876** | **0.2927** | **5.1000e-004** | | **0.0135** | **0.0135** | | **0.0131** | **0.0131** | **0.0000** | **41.7626** | **41.7626** | **7.2700e-003** | **0.0000** | **41.9445** |

## 3.4 Building Construction - 2022

**Mitigated Construction Off-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Hauling | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Vendor | 8.5000e-004 | 0.0225 | 7.4500e-003 | 9.0000e-005 | 2.7500e-003 | 2.0000e-004 | 2.9600e-003 | 7.9000e-004 | 2.0000e-004 | 9.9000e-004 | 0.0000 | 8.3449 | 8.3449 | 2.8000e-004 | 1.2000e-003 | 8.7105 |
| Worker | 3.4700e-003 | 2.8900e-003 | 0.0376 | 1.0000e-004 | 0.0111 | 7.0000e-005 | 0.0112 | 2.9500e-003 | 7.0000e-005 | 3.0100e-003 | 0.0000 | 9.1796 | 9.1796 | 2.6000e-004 | 2.5000e-004 | 9.2604 |
| **Total** | **4.3200e-003** | **0.0254** | **0.0450** | **1.9000e-004** | **0.0138** | **2.7000e-004** | **0.0141** | **3.7400e-003** | **2.7000e-004** | **4.0000e-003** | **0.0000** | **17.5244** | **17.5244** | **5.4000e-004** | **1.4500e-003** | **17.9709** |

## 3.4 Building Construction - 2023

**Unmitigated Construction On-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Off-Road | 0.1980 | 1.5224 | 1.6394 | 2.8700e-003 | | 0.0669 | 0.0669 | | 0.0646 | 0.0646 | 0.0000 | 236.0789 | 236.0789 | 0.0401 | 0.0000 | 237.0811 |
| **Total** | **0.1980** | **1.5224** | **1.6394** | **2.8700e-003** | | **0.0669** | **0.0669** | | **0.0646** | **0.0646** | **0.0000** | **236.0789** | **236.0789** | **0.0401** | **0.0000** | **237.0811** |

## 3.4 Building Construction - 2023

**Unmitigated Construction Off-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Hauling | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Vendor | 2.7900e-003 | 0.0995 | 0.0373 | 4.6000e-004 | 0.0156 | 4.8000e-004 | 0.0160 | 4.4900e-003 | 4.6000e-004 | 4.9500e-003 | 0.0000 | 44.9101 | 44.9101 | 1.5000e-003 | 6.4600e-003 | 46.8737 |
| Worker | 0.0182 | 0.0144 | 0.1954 | 5.4000e-004 | 0.0627 | 3.9000e-004 | 0.0631 | 0.0167 | 3.6000e-004 | 0.0170 | 0.0000 | 50.5177 | 50.5177 | 1.3300e-003 | 1.3000e-003 | 50.9379 |
| **Total** | **0.0210** | **0.1140** | **0.2327** | **1.0000e-003** | **0.0783** | **8.7000e-004** | **0.0791** | **0.0211** | **8.2000e-004** | **0.0220** | **0.0000** | **95.4278** | **95.4278** | **2.8300e-003** | **7.7600e-003** | **97.8115** |

**Mitigated Construction On-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Off-Road | 0.1980 | 1.5224 | 1.6394 | 2.8700e-003 | | 0.0669 | 0.0669 | | 0.0646 | 0.0646 | 0.0000 | 236.0786 | 236.0786 | 0.0401 | 0.0000 | 237.0808 |
| **Total** | **0.1980** | **1.5224** | **1.6394** | **2.8700e-003** | | **0.0669** | **0.0669** | | **0.0646** | **0.0646** | **0.0000** | **236.0786** | **236.0786** | **0.0401** | **0.0000** | **237.0808** |

## 3.4 Building Construction - 2023

**Mitigated Construction Off-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Hauling | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Vendor | 2.7900e-003 | 0.0995 | 0.0373 | 4.6000e-004 | 0.0156 | 4.8000e-004 | 0.0160 | 4.4900e-003 | 4.6000e-004 | 4.9500e-003 | 0.0000 | 44.9101 | 44.9101 | 1.5000e-003 | 6.4600e-003 | 46.8737 |
| Worker | 0.0182 | 0.0144 | 0.1954 | 5.4000e-004 | 0.0627 | 3.9000e-004 | 0.0631 | 0.0167 | 3.6000e-004 | 0.0170 | 0.0000 | 50.5177 | 50.5177 | 1.3300e-003 | 1.3000e-003 | 50.9379 |
| **Total** | **0.0210** | **0.1140** | **0.2327** | **1.0000e-003** | **0.0783** | **8.7000e-004** | **0.0791** | **0.0211** | **8.2000e-004** | **0.0220** | **0.0000** | **95.4278** | **95.4278** | **2.8300e-003** | **7.7600e-003** | **97.8115** |

## 3.4 Building Construction - 2024

**Unmitigated Construction On-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Off-Road | 0.0213 | 0.1660 | 0.1878 | 3.3000e-004 | | 6.7600e-003 | 6.7600e-003 | | 6.5200e-003 | 6.5200e-003 | 0.0000 | 27.2417 | 27.2417 | 4.5400e-003 | 0.0000 | 27.3551 |
| **Total** | **0.0213** | **0.1660** | **0.1878** | **3.3000e-004** | | **6.7600e-003** | **6.7600e-003** | | **6.5200e-003** | **6.5200e-003** | **0.0000** | **27.2417** | **27.2417** | **4.5400e-003** | **0.0000** | **27.3551** |

## 3.4 Building Construction - 2024

**Unmitigated Construction Off-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Hauling | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Vendor | 3.1000e-004 | 0.0115 | 4.2100e-003 | 5.0000e-005 | 1.8000e-003 | 6.0000e-005 | 1.8500e-003 | 5.2000e-004 | 5.0000e-005 | 5.7000e-004 | 0.0000 | 5.1042 | 5.1042 | 1.7000e-004 | 7.4000e-004 | 5.3277 |
| Worker | 1.9600e-003 | 1.4900e-003 | 0.0210 | 6.0000e-005 | 7.2300e-003 | 4.0000e-005 | 7.2700e-003 | 1.9200e-003 | 4.0000e-005 | 1.9600e-003 | 0.0000 | 5.7092 | 5.7092 | 1.4000e-004 | 1.4000e-004 | 5.7542 |
| **Total** | **2.2700e-003** | **0.0130** | **0.0252** | **1.1000e-004** | **9.0300e-003** | **1.0000e-004** | **9.1200e-003** | **2.4400e-003** | **9.0000e-005** | **2.5300e-003** | **0.0000** | **10.8134** | **10.8134** | **3.1000e-004** | **8.8000e-004** | **11.0818** |

**Mitigated Construction On-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Off-Road | 0.0213 | 0.1660 | 0.1878 | 3.3000e-004 | | 6.7600e-003 | 6.7600e-003 | | 6.5200e-003 | 6.5200e-003 | 0.0000 | 27.2417 | 27.2417 | 4.5400e-003 | 0.0000 | 27.3551 |
| **Total** | **0.0213** | **0.1660** | **0.1878** | **3.3000e-004** | | **6.7600e-003** | **6.7600e-003** | | **6.5200e-003** | **6.5200e-003** | **0.0000** | **27.2417** | **27.2417** | **4.5400e-003** | **0.0000** | **27.3551** |

## 3.4 Building Construction - 2024

**Mitigated Construction Off-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Hauling | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Vendor | 3.1000e-004 | 0.0115 | 4.2100e-003 | 5.0000e-005 | 1.8000e-003 | 6.0000e-005 | 1.8500e-003 | 5.2000e-004 | 5.0000e-005 | 5.7000e-004 | 0.0000 | 5.1042 | 5.1042 | 1.7000e-004 | 7.4000e-004 | 5.3277 |
| Worker | 1.9600e-003 | 1.4900e-003 | 0.0210 | 6.0000e-005 | 7.2300e-003 | 4.0000e-005 | 7.2700e-003 | 1.9200e-003 | 4.0000e-005 | 1.9600e-003 | 0.0000 | 5.7092 | 5.7092 | 1.4000e-004 | 1.4000e-004 | 5.7542 |
| **Total** | **2.2700e-003** | **0.0130** | **0.0252** | **1.1000e-004** | **9.0300e-003** | **1.0000e-004** | **9.1200e-003** | **2.4400e-003** | **9.0000e-005** | **2.5300e-003** | **0.0000** | **10.8134** | **10.8134** | **3.1000e-004** | **8.8000e-004** | **11.0818** |

## 3.5 Paving - 2024

**Unmitigated Construction On-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Off-Road | 5.2500e-003 | 0.0498 | 0.0750 | 1.2000e-004 | | 2.3900e-003 | 2.3900e-003 | | 2.2100e-003 | 2.2100e-003 | 0.0000 | 10.0080 | 10.0080 | 3.1700e-003 | 0.0000 | 10.0873 |
| Paving | 0.0000 | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| **Total** | **5.2500e-003** | **0.0498** | **0.0750** | **1.2000e-004** | | **2.3900e-003** | **2.3900e-003** | | **2.2100e-003** | **2.2100e-003** | **0.0000** | **10.0080** | **10.0080** | **3.1700e-003** | **0.0000** | **10.0873** |

## 3.5 Paving - 2024

**Unmitigated Construction Off-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Hauling | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Vendor | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Worker | 3.3000e-004 | 2.5000e-004 | 3.5200e-003 | 1.0000e-005 | 1.2100e-003 | 1.0000e-005 | 1.2200e-003 | 3.2000e-004 | 1.0000e-005 | 3.3000e-004 | 0.0000 | 0.9559 | 0.9559 | 2.0000e-005 | 2.0000e-005 | 0.9634 |
| **Total** | **3.3000e-004** | **2.5000e-004** | **3.5200e-003** | **1.0000e-005** | **1.2100e-003** | **1.0000e-005** | **1.2200e-003** | **3.2000e-004** | **1.0000e-005** | **3.3000e-004** | **0.0000** | **0.9559** | **0.9559** | **2.0000e-005** | **2.0000e-005** | **0.9634** |

**Mitigated Construction On-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Off-Road | 5.2500e-003 | 0.0498 | 0.0750 | 1.2000e-004 | | 2.3900e-003 | 2.3900e-003 | | 2.2100e-003 | 2.2100e-003 | 0.0000 | 10.0080 | 10.0080 | 3.1700e-003 | 0.0000 | 10.0873 |
| Paving | 0.0000 | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| **Total** | **5.2500e-003** | **0.0498** | **0.0750** | **1.2000e-004** | | **2.3900e-003** | **2.3900e-003** | | **2.2100e-003** | **2.2100e-003** | **0.0000** | **10.0080** | **10.0080** | **3.1700e-003** | **0.0000** | **10.0873** |

## 3.5 Paving - 2024

**Mitigated Construction Off-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Hauling | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Vendor | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Worker | 3.3000e-004 | 2.5000e-004 | 3.5200e-003 | 1.0000e-005 | 1.2100e-003 | 1.0000e-005 | 1.2200e-003 | 3.2000e-004 | 1.0000e-005 | 3.3000e-004 | 0.0000 | 0.9559 | 0.9559 | 2.0000e-005 | 2.0000e-005 | 0.9634 |
| **Total** | **3.3000e-004** | **2.5000e-004** | **3.5200e-003** | **1.0000e-005** | **1.2100e-003** | **1.0000e-005** | **1.2200e-003** | **3.2000e-004** | **1.0000e-005** | **3.3000e-004** | **0.0000** | **0.9559** | **0.9559** | **2.0000e-005** | **2.0000e-005** | **0.9634** |

## 3.6 Architectural Coating - 2024

**Unmitigated Construction On-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Archit. Coating | 0.2674 | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Off-Road | 1.5400e-003 | 0.0104 | 0.0154 | 3.0000e-005 | | 5.2000e-004 | 5.2000e-004 | | 5.2000e-004 | 5.2000e-004 | 0.0000 | 2.1703 | 2.1703 | 1.2000e-004 | 0.0000 | 2.1733 |
| **Total** | **0.2689** | **0.0104** | **0.0154** | **3.0000e-005** | | **5.2000e-004** | **5.2000e-004** | | **5.2000e-004** | **5.2000e-004** | **0.0000** | **2.1703** | **2.1703** | **1.2000e-004** | **0.0000** | **2.1733** |

## 3.6 Architectural Coating - 2024

**Unmitigated Construction Off-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Hauling | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Vendor | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Worker | 2.3000e-004 | 1.7000e-004 | 2.4300e-003 | 1.0000e-005 | 8.4000e-004 | 0.0000 | 8.4000e-004 | 2.2000e-004 | 0.0000 | 2.3000e-004 | 0.0000 | 0.6618 | 0.6618 | 2.0000e-005 | 2.0000e-005 | 0.6670 |
| **Total** | **2.3000e-004** | **1.7000e-004** | **2.4300e-003** | **1.0000e-005** | **8.4000e-004** | **0.0000** | **8.4000e-004** | **2.2000e-004** | **0.0000** | **2.3000e-004** | **0.0000** | **0.6618** | **0.6618** | **2.0000e-005** | **2.0000e-005** | **0.6670** |

**Mitigated Construction On-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Archit. Coating | 0.2674 | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Off-Road | 1.5400e-003 | 0.0104 | 0.0154 | 3.0000e-005 | | 5.2000e-004 | 5.2000e-004 | | 5.2000e-004 | 5.2000e-004 | 0.0000 | 2.1703 | 2.1703 | 1.2000e-004 | 0.0000 | 2.1733 |
| **Total** | **0.2689** | **0.0104** | **0.0154** | **3.0000e-005** | | **5.2000e-004** | **5.2000e-004** | | **5.2000e-004** | **5.2000e-004** | **0.0000** | **2.1703** | **2.1703** | **1.2000e-004** | **0.0000** | **2.1733** |

## 3.6 Architectural Coating - 2024

**Mitigated Construction Off-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Hauling | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Vendor | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Worker | 2.3000e-004 | 1.7000e-004 | 2.4300e-003 | 1.0000e-005 | 8.4000e-004 | 0.0000 | 8.4000e-004 | 2.2000e-004 | 0.0000 | 2.3000e-004 | 0.0000 | 0.6618 | 0.6618 | 2.0000e-005 | 2.0000e-005 | 0.6670 |
| **Total** | **2.3000e-004** | **1.7000e-004** | **2.4300e-003** | **1.0000e-005** | **8.4000e-004** | **0.0000** | **8.4000e-004** | **2.2000e-004** | **0.0000** | **2.3000e-004** | **0.0000** | **0.6618** | **0.6618** | **2.0000e-005** | **2.0000e-005** | **0.6670** |

# 4.0 Operational Detail - Mobile

## 4.1 Mitigation Measures Mobile

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Mitigated | 0.3938 | 0.4464 | 4.0499 | 8.7700e-003 | 0.9272 | 6.4600e-003 | 0.9336 | 0.2474 | 6.0000e-003 | 0.2534 | 0.0000 | 824.6739 | 824.6739 | 0.0563 | 0.0355 | 836.6698 |
| Unmitigated | 0.3938 | 0.4464 | 4.0499 | 8.7700e-003 | 0.9272 | 6.4600e-003 | 0.9336 | 0.2474 | 6.0000e-003 | 0.2534 | 0.0000 | 824.6739 | 824.6739 | 0.0563 | 0.0355 | 836.6698 |

## 4.2 Trip Summary Information

| | Average Daily Trip Rate | | | Unmitigated | Mitigated |
|---|---|---|---|---|---|
| Land Use | Weekday | Saturday | Sunday | Annual VMT | Annual VMT |
| General Office Building | 766.04 | 766.04 | 766.04 | 2,467,779 | 2,467,779 |
| Parking Lot | 0.00 | 0.00 | 0.00 | | |
| Strip Mall | 0.00 | 0.00 | 0.00 | | |
| Total | 766.04 | 766.04 | 766.04 | 2,467,779 | 2,467,779 |

## 4.3 Trip Type Information

| | Miles | | | Trip % | | | Trip Purpose % | | |
|---|---|---|---|---|---|---|---|---|---|
| Land Use | H-W or C-W | H-S or C-C | H-O or C-NW | H-W or C-W | H-S or C-C | H-O or C-NW | Primary | Diverted | Pass-by |
| General Office Building | 16.60 | 8.40 | 6.90 | 33.00 | 48.00 | 19.00 | 77 | 19 | 4 |
| Parking Lot | 16.60 | 8.40 | 6.90 | 0.00 | 0.00 | 0.00 | 0 | 0 | 0 |
| Strip Mall | 16.60 | 8.40 | 6.90 | 16.60 | 64.40 | 19.00 | 45 | 40 | 15 |

## 4.4 Fleet Mix

| Land Use | LDA | LDT1 | LDT2 | MDV | LHD1 | LHD2 | MHD | HHD | OBUS | UBUS | MCY | SBUS | MH |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| General Office Building | 0.542464 | 0.063735 | 0.188241 | 0.126899 | 0.023249 | 0.006239 | 0.010717 | 0.008079 | 0.000923 | 0.000604 | 0.024795 | 0.000702 | 0.003352 |
| Parking Lot | 0.542464 | 0.063735 | 0.188241 | 0.126899 | 0.023249 | 0.006239 | 0.010717 | 0.008079 | 0.000923 | 0.000604 | 0.024795 | 0.000702 | 0.003352 |

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied**

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Strip Mall | 0.542464 | 0.063735 | 0.188241 | 0.126899 | 0.023249 | 0.006239 | 0.010717 | 0.008079 | 0.000923 | 0.000604 | 0.024795 | 0.000702 | 0.003352 |

## 5.0 Energy Detail

Historical Energy Use: N

### 5.1 Mitigation Measures Energy

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Electricity Mitigated | | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 127.6533 | 127.6533 | 0.0108 | 1.3100e-003 | 128.3119 |
| Electricity Unmitigated | | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 127.6533 | 127.6533 | 0.0108 | 1.3100e-003 | 128.3119 |
| NaturalGas Mitigated | 3.0800e-003 | 0.0280 | 0.0235 | 1.7000e-004 | | 2.1300e-003 | 2.1300e-003 | | 2.1300e-003 | 2.1300e-003 | 0.0000 | 30.4762 | 30.4762 | 5.8000e-004 | 5.6000e-004 | 30.6573 |
| NaturalGas Unmitigated | 3.0800e-003 | 0.0280 | 0.0235 | 1.7000e-004 | | 2.1300e-003 | 2.1300e-003 | | 2.1300e-003 | 2.1300e-003 | 0.0000 | 30.4762 | 30.4762 | 5.8000e-004 | 5.6000e-004 | 30.6573 |

## 5.2 Energy by Land Use - NaturalGas

**Unmitigated**

| | NaturalGas Use | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Land Use | kBTU/yr | tons/yr | | | | | | | | | | MT/yr | | | | | |
| General Office Building | 570287 | 3.0800e-003 | 0.0280 | 0.0235 | 1.7000e-004 | | 2.1200e-003 | 2.1200e-003 | | 2.1200e-003 | 2.1200e-003 | 0.0000 | 30.4327 | 30.4327 | 5.8000e-004 | 5.6000e-004 | 30.6136 |
| Parking Lot | 0 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Strip Mall | 815 | 0.0000 | 4.0000e-005 | 3.0000e-005 | 0.0000 | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0435 | 0.0435 | 0.0000 | 0.0000 | 0.0438 |
| **Total** | | **3.0800e-003** | **0.0280** | **0.0235** | **1.7000e-004** | | **2.1200e-003** | **2.1200e-003** | | **2.1200e-003** | **2.1200e-003** | **0.0000** | **30.4762** | **30.4762** | **5.8000e-004** | **5.6000e-004** | **30.6573** |

## 5.2 Energy by Land Use - NaturalGas

**Mitigated**

| | NaturalGas Use | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Land Use | kBTU/yr | tons/yr | | | | | | | | | | MT/yr | | | | | |
| General Office Building | 570287 | 3.0800e-003 | 0.0280 | 0.0235 | 1.7000e-004 | | 2.1200e-003 | 2.1200e-003 | | 2.1200e-003 | 2.1200e-003 | 0.0000 | 30.4327 | 30.4327 | 5.8000e-004 | 5.6000e-004 | 30.6136 |
| Parking Lot | 0 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Strip Mall | 815 | 0.0000 | 4.0000e-005 | 3.0000e-005 | 0.0000 | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0435 | 0.0435 | 0.0000 | 0.0000 | 0.0438 |
| **Total** | | **3.0800e-003** | **0.0280** | **0.0235** | **1.7000e-004** | | **2.1200e-003** | **2.1200e-003** | | **2.1200e-003** | **2.1200e-003** | **0.0000** | **30.4762** | **30.4762** | **5.8000e-004** | **5.6000e-004** | **30.6573** |

## 5.3 Energy by Land Use - Electricity

**Unmitigated**

| | Electricity Use | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|
| Land Use | kWh/yr | MT/yr | | | |
| General Office Building | 691425 | 122.6211 | 0.0104 | 1.2500e-003 | 123.2537 |
| Parking Lot | 21840 | 3.8732 | 3.3000e-004 | 4.0000e-005 | 3.8932 |
| Strip Mall | 6535 | 1.1590 | 1.0000e-004 | 1.0000e-005 | 1.1649 |
| **Total** | | **127.6533** | **0.0108** | **1.3000e-003** | **128.3119** |

## 5.3 Energy by Land Use - Electricity

**Mitigated**

| | Electricity Use | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|
| Land Use | kWh/yr | MT/yr | | | |
| General Office Building | 691425 | 122.6211 | 0.0104 | 1.2500e-003 | 123.2537 |
| Parking Lot | 21840 | 3.8732 | 3.3000e-004 | 4.0000e-005 | 3.8932 |
| Strip Mall | 6535 | 1.1590 | 1.0000e-004 | 1.0000e-005 | 1.1649 |
| **Total** | | **127.6533** | **0.0108** | **1.3000e-003** | **128.3119** |

# 6.0 Area Detail

## 6.1 Mitigation Measures Area

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Mitigated | 0.2327 | 2.0000e-005 | 2.7000e-003 | 0.0000 | | 1.0000e-005 | 1.0000e-005 | | 1.0000e-005 | 1.0000e-005 | 0.0000 | 5.2600e-003 | 5.2600e-003 | 1.0000e-005 | 0.0000 | 5.6000e-003 |
| Unmitigated | 0.2327 | 2.0000e-005 | 2.7000e-003 | 0.0000 | | 1.0000e-005 | 1.0000e-005 | | 1.0000e-005 | 1.0000e-005 | 0.0000 | 5.2600e-003 | 5.2600e-003 | 1.0000e-005 | 0.0000 | 5.6000e-003 |

## 6.2 Area by SubCategory

**Unmitigated**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SubCategory | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Architectural Coating | 0.0267 | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Consumer Products | 0.2057 | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Landscaping | 2.5000e-004 | 2.0000e-005 | 2.7000e-003 | 0.0000 | | 1.0000e-005 | 1.0000e-005 | | 1.0000e-005 | 1.0000e-005 | 0.0000 | 5.2600e-003 | 5.2600e-003 | 1.0000e-005 | 0.0000 | 5.6000e-003 |
| **Total** | **0.2327** | **2.0000e-005** | **2.7000e-003** | **0.0000** | | **1.0000e-005** | **1.0000e-005** | | **1.0000e-005** | **1.0000e-005** | **0.0000** | **5.2600e-003** | **5.2600e-003** | **1.0000e-005** | **0.0000** | **5.6000e-003** |

## 6.2 Area by SubCategory

**Mitigated**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SubCategory | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Architectural Coating | 0.0267 | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Consumer Products | 0.2057 | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Landscaping | 2.5000e-004 | 2.0000e-005 | 2.7000e-003 | 0.0000 | | 1.0000e-005 | 1.0000e-005 | | 1.0000e-005 | 1.0000e-005 | 0.0000 | 5.2600e-003 | 5.2600e-003 | 1.0000e-005 | 0.0000 | 5.6000e-003 |
| **Total** | **0.2327** | **2.0000e-005** | **2.7000e-003** | **0.0000** | | **1.0000e-005** | **1.0000e-005** | | **1.0000e-005** | **1.0000e-005** | **0.0000** | **5.2600e-003** | **5.2600e-003** | **1.0000e-005** | **0.0000** | **5.6000e-003** |

# 7.0 Water Detail

## 7.1 Mitigation Measures Water

| | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|
| Category | MT/yr | | | |
| Mitigated | 37.8327 | 0.3245 | 7.9500e-003 | 48.3125 |
| Unmitigated | 37.8327 | 0.3245 | 7.9500e-003 | 48.3125 |

## 7.2 Water by Land Use

**Unmitigated**

| | Indoor/Outdoor Use | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|
| Land Use | Mgal | MT/yr | | | |
| General Office Building | 9.83045 / 6.02512 | 37.6907 | 0.3232 | 7.9200e-003 | 48.1312 |
| Parking Lot | 0 / 0 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Strip Mall | 0.0370363 / 0.0226996 | 0.1420 | 1.2200e-003 | 3.0000e-005 | 0.1813 |
| **Total** | | **37.8327** | **0.3245** | **7.9500e-003** | **48.3125** |

### 7.2 Water by Land Use

**Mitigated**

| | Indoor/Outdoor Use | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|
| Land Use | Mgal | MT/yr | | | |
| General Office Building | 9.83045 / 6.02512 | 37.6907 | 0.3232 | 7.9200e-003 | 48.1312 |
| Parking Lot | 0 / 0 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Strip Mall | 0.0370363 / 0.0226996 | 0.1420 | 1.2200e-003 | 3.0000e-005 | 0.1813 |
| **Total** | | **37.8327** | **0.3245** | **7.9500e-003** | **48.3125** |

## 8.0 Waste Detail

### 8.1 Mitigation Measures Waste

**Category/Year**

| | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|
| | MT/yr | | | |
| Mitigated | 10.5494 | 0.6235 | 0.0000 | 26.1358 |
| Unmitigated | 10.5494 | 0.6235 | 0.0000 | 26.1358 |

## 8.2 Waste by Land Use

**Unmitigated**

| | Waste Disposed | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|
| Land Use | tons | MT/yr | | | |
| General Office Building | 51.44 | 10.4419 | 0.6171 | 0.0000 | 25.8693 |
| Parking Lot | 0 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Strip Mall | 0.53 | 0.1076 | 6.3600e-003 | 0.0000 | 0.2665 |
| **Total** | | **10.5495** | **0.6235** | **0.0000** | **26.1358** |

## 8.2 Waste by Land Use

**Mitigated**

| | Waste Disposed | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|
| Land Use | tons | MT/yr | | | |
| General Office Building | 51.44 | 10.4419 | 0.6171 | 0.0000 | 25.8693 |
| Parking Lot | 0 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Strip Mall | 0.53 | 0.1076 | 6.3600e-003 | 0.0000 | 0.2665 |
| **Total** | | **10.5495** | **0.6235** | **0.0000** | **26.1358** |

# 9.0 Operational Offroad

| Equipment Type | Number | Hours/Day | Days/Year | Horse Power | Load Factor | Fuel Type |
|---|---|---|---|---|---|---|

# 10.0 Stationary Equipment

**Fire Pumps and Emergency Generators**

| Equipment Type | Number | Hours/Day | Hours/Year | Horse Power | Load Factor | Fuel Type |
|---|---|---|---|---|---|---|

**Boilers**

| Equipment Type | Number | Heat Input/Day | Heat Input/Year | Boiler Rating | Fuel Type |
|---|---|---|---|---|---|

**User Defined Equipment**

| Equipment Type | Number |
|---|---|

## 11.0 Vegetation

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied**

# 1200 Cahuenga Project

**Los Angeles-South Coast County, Summer**

## 1.0 Project Characteristics

### 1.1 Land Usage

| Land Uses | Size | Metric | Lot Acreage | Floor Surface Area | Population |
|---|---|---|---|---|---|
| General Office Building | 55.31 | 1000sqft | 1.22 | 55,314.00 | 0 |
| Parking Lot | 156.00 | Space | 0.00 | 62,400.00 | 0 |
| Strip Mall | 0.50 | 1000sqft | 0.01 | 500.00 | 0 |

### 1.2 Other Project Characteristics

| | | | | | |
|---|---|---|---|---|---|
| **Urbanization** | Urban | **Wind Speed (m/s)** | 2.2 | **Precipitation Freq (Days)** | 33 |
| **Climate Zone** | 11 | | | **Operational Year** | 2024 |
| **Utility Company** | Southern California Edison | | | | |
| **CO2 Intensity (lb/MWhr)** | 390.98 | **CH4 Intensity (lb/MWhr)** | 0.033 | **N2O Intensity (lb/MWhr)** | 0.004 |

### 1.3 User Entered Comments & Non-Default Data

Project Characteristics - Consistent with the IS/MND's model.

Land Use - Consistent with the IS/MND's model.

Construction Phase - Consistent with the IS/MND's model.

Trips and VMT - See SWAPE's comment on "Underestimated Number of Operational Vehicle Trips"

Grading - Consistent with the IS/MND's model.

Vehicle Trips - See SWAPE's comment on "Underestimated Number of Operational Vehicle Trips".

Construction Off-road Equipment Mitigation - Consistent with the IS/MND's model.

Demolition -

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied**

| Table Name | Column Name | Default Value | New Value |
|---|---|---|---|
| tblConstructionPhase | NumDays | 10.00 | 17.00 |
| tblConstructionPhase | NumDays | 200.00 | 336.00 |
| tblConstructionPhase | NumDays | 20.00 | 34.00 |
| tblConstructionPhase | NumDays | 4.00 | 7.00 |
| tblConstructionPhase | NumDays | 10.00 | 17.00 |
| tblGrading | MaterialExported | 0.00 | 12,678.00 |
| tblLandUse | LandUseSquareFeet | 55,310.00 | 55,314.00 |
| tblLandUse | LotAcreage | 1.27 | 1.22 |
| tblLandUse | LotAcreage | 1.40 | 0.00 |
| tblVehicleTrips | ST_TR | 2.21 | 13.85 |
| tblVehicleTrips | ST_TR | 42.04 | 0.00 |
| tblVehicleTrips | SU_TR | 0.70 | 13.85 |
| tblVehicleTrips | SU_TR | 20.43 | 0.00 |
| tblVehicleTrips | WD_TR | 9.74 | 13.85 |
| tblVehicleTrips | WD_TR | 44.32 | 0.00 |

## 2.0 Emissions Summary

## 2.1 Overall Construction (Maximum Daily Emission)

**Unmitigated Construction**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Year | lb/day | | | | | | | | | | lb/day | | | | | |
| 2022 | 2.6299 | 55.0373 | 18.4811 | 0.1623 | 11.3625 | 1.0255 | 12.3880 | 4.5720 | 0.9539 | 5.5259 | 0.0000 | 17,514.1997 | 17,514.1997 | 1.4669 | 2.4482 | 18,280.4497 |
| 2023 | 1.6860 | 12.5379 | 14.4880 | 0.0300 | 0.6135 | 0.5211 | 1.1346 | 0.1655 | 0.5031 | 0.6685 | 0.0000 | 2,827.8740 | 2,827.8740 | 0.3638 | 0.0649 | 2,856.2980 |
| 2024 | 31.6635 | 11.8823 | 14.2778 | 0.0298 | 0.6135 | 0.4571 | 1.0706 | 0.1655 | 0.4409 | 0.6064 | 0.0000 | 2,813.1083 | 2,813.1083 | 0.4144 | 0.0634 | 2,840.9042 |
| **Maximum** | **31.6635** | **55.0373** | **18.4811** | **0.1623** | **11.3625** | **1.0255** | **12.3880** | **4.5720** | **0.9539** | **5.5259** | **0.0000** | **17,514.1997** | **17,514.1997** | **1.4669** | **2.4482** | **18,280.4497** |

**Mitigated Construction**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Year | lb/day | | | | | | | | | | lb/day | | | | | |
| 2022 | 2.6299 | 55.0373 | 18.4811 | 0.1623 | 11.3625 | 1.0255 | 12.3880 | 4.5720 | 0.9539 | 5.5259 | 0.0000 | 17,514.1997 | 17,514.1997 | 1.4669 | 2.4482 | 18,280.4497 |
| 2023 | 1.6860 | 12.5379 | 14.4880 | 0.0300 | 0.6135 | 0.5211 | 1.1346 | 0.1655 | 0.5031 | 0.6685 | 0.0000 | 2,827.8740 | 2,827.8740 | 0.3638 | 0.0649 | 2,856.2980 |
| 2024 | 31.6635 | 11.8823 | 14.2778 | 0.0298 | 0.6135 | 0.4571 | 1.0706 | 0.1655 | 0.4409 | 0.6064 | 0.0000 | 2,813.1083 | 2,813.1083 | 0.4144 | 0.0634 | 2,840.9042 |
| **Maximum** | **31.6635** | **55.0373** | **18.4811** | **0.1623** | **11.3625** | **1.0255** | **12.3880** | **4.5720** | **0.9539** | **5.5259** | **0.0000** | **17,514.1997** | **17,514.1997** | **1.4669** | **2.4482** | **18,280.4497** |

## EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio-CO2 | Total CO2 | CH4 | N20 | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Percent Reduction | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

## 2.2 Overall Operational

**Unmitigated Operational**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Area | 1.2757 | 2.0000e-004 | 0.0216 | 0.0000 | | 8.0000e-005 | 8.0000e-005 | | 8.0000e-005 | 8.0000e-005 | | 0.0464 | 0.0464 | 1.2000e-004 | | 0.0494 |
| Energy | 0.0169 | 0.1534 | 0.1289 | 9.2000e-004 | | 0.0117 | 0.0117 | | 0.0117 | 0.0117 | | 184.0781 | 184.0781 | 3.5300e-003 | 3.3700e-003 | 185.1720 |
| Mobile | 2.2415 | 2.2403 | 22.5245 | 0.0498 | 5.1956 | 0.0355 | 5.2311 | 1.3839 | 0.0330 | 1.4169 | | 5,161.0702 | 5,161.0702 | 0.3334 | 0.2049 | 5,230.4538 |
| **Total** | **3.5341** | **2.3939** | **22.6750** | **0.0507** | **5.1956** | **0.0473** | **5.2428** | **1.3839** | **0.0447** | **1.4287** | | **5,345.1947** | **5,345.1947** | **0.3370** | **0.2082** | **5,415.6752** |

**Mitigated Operational**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Area | 1.2757 | 2.0000e-004 | 0.0216 | 0.0000 | | 8.0000e-005 | 8.0000e-005 | | 8.0000e-005 | 8.0000e-005 | | 0.0464 | 0.0464 | 1.2000e-004 | | 0.0494 |
| Energy | 0.0169 | 0.1534 | 0.1289 | 9.2000e-004 | | 0.0117 | 0.0117 | | 0.0117 | 0.0117 | | 184.0781 | 184.0781 | 3.5300e-003 | 3.3700e-003 | 185.1720 |
| Mobile | 2.2415 | 2.2403 | 22.5245 | 0.0498 | 5.1956 | 0.0355 | 5.2311 | 1.3839 | 0.0330 | 1.4169 | | 5,161.0702 | 5,161.0702 | 0.3334 | 0.2049 | 5,230.4538 |
| **Total** | **3.5341** | **2.3939** | **22.6750** | **0.0507** | **5.1956** | **0.0473** | **5.2428** | **1.3839** | **0.0447** | **1.4287** | | **5,345.1947** | **5,345.1947** | **0.3370** | **0.2082** | **5,415.6752** |

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio-CO2 | Total CO2 | CH4 | N20 | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Percent Reduction | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

## 3.0 Construction Detail

### Construction Phase

| Phase Number | Phase Name | Phase Type | Start Date | End Date | Num Days Week | Num Days | Phase Description |
|---|---|---|---|---|---|---|---|
| 1 | Demolition | Demolition | 9/1/2022 | 10/18/2022 | 5 | 34 | |
| 2 | Grading | Grading | 10/19/2022 | 10/27/2022 | 5 | 7 | |
| 3 | Building Construction | Building Construction | 10/28/2022 | 2/9/2024 | 5 | 336 | |
| 4 | Paving | Paving | 2/10/2024 | 3/5/2024 | 5 | 17 | |
| 5 | Architectural Coating | Architectural Coating | 3/6/2024 | 3/28/2024 | 5 | 17 | |

**Acres of Grading (Site Preparation Phase): 0**

**Acres of Grading (Grading Phase): 7**

**Acres of Paving: 0**

**Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 83,721; Non-Residential Outdoor: 27,907; Striped Parking Area: 3,744 (Architectural Coating – sqft)**

### OffRoad Equipment

| Phase Name | Offroad Equipment Type | Amount | Usage Hours | Horse Power | Load Factor |
|---|---|---|---|---|---|
| Demolition | Concrete/Industrial Saws | 1 | 8.00 | 81 | 0.73 |
| Demolition | Rubber Tired Dozers | 1 | 8.00 | 247 | 0.40 |
| Demolition | Tractors/Loaders/Backhoes | 3 | 8.00 | 97 | 0.37 |
| Grading | Graders | 1 | 8.00 | 187 | 0.41 |
| Grading | Rubber Tired Dozers | 1 | 8.00 | 247 | 0.40 |
| Grading | Tractors/Loaders/Backhoes | 2 | 7.00 | 97 | 0.37 |

| | | | | | |
|---|---|---|---|---|---|
| Building Construction | Cranes | 1 | 6.00 | 231 | 0.29 |
| Building Construction | Forklifts | 1 | 6.00 | 89 | 0.20 |
| Building Construction | Generator Sets | 1 | 8.00 | 84 | 0.74 |
| Building Construction | Tractors/Loaders/Backhoes | 1 | 6.00 | 97 | 0.37 |
| Building Construction | Welders | 3 | 8.00 | 46 | 0.45 |
| Paving | Cement and Mortar Mixers | 1 | 6.00 | 9 | 0.56 |
| Paving | Pavers | 1 | 6.00 | 130 | 0.42 |
| Paving | Paving Equipment | 1 | 8.00 | 132 | 0.36 |
| Paving | Rollers | 1 | 7.00 | 80 | 0.38 |
| Paving | Tractors/Loaders/Backhoes | 1 | 8.00 | 97 | 0.37 |
| Architectural Coating | Air Compressors | 1 | 6.00 | 78 | 0.48 |

**Trips and VMT**

| Phase Name | Offroad Equipment Count | Worker Trip Number | Vendor Trip Number | Hauling Trip Number | Worker Trip Length | Vendor Trip Length | Hauling Trip Length | Worker Vehicle Class | Vendor Vehicle Class | Hauling Vehicle Class |
|---|---|---|---|---|---|---|---|---|---|---|
| Demolition | 5 | 13.00 | 0.00 | 205.00 | 14.70 | 6.90 | 20.00 | LD_Mix | HDT_Mix | HHDT |
| Grading | 4 | 10.00 | 0.00 | 1,585.00 | 14.70 | 6.90 | 20.00 | LD_Mix | HDT_Mix | HHDT |
| Building Construction | 7 | 44.00 | 19.00 | 0.00 | 14.70 | 6.90 | 20.00 | LD_Mix | HDT_Mix | HHDT |
| Paving | 5 | 13.00 | 0.00 | 0.00 | 14.70 | 6.90 | 20.00 | LD_Mix | HDT_Mix | HHDT |
| Architectural Coating | 1 | 9.00 | 0.00 | 0.00 | 14.70 | 6.90 | 20.00 | LD_Mix | HDT_Mix | HHDT |

## 3.1 Mitigation Measures Construction

Water Exposed Area

## 3.2 Demolition - 2022

### Unmitigated Construction On-Site

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Fugitive Dust | | | | | 1.3028 | 0.0000 | 1.3028 | 0.1973 | 0.0000 | 0.1973 | | | 0.0000 | | | 0.0000 |
| Off-Road | 1.6889 | 16.6217 | 13.9605 | 0.0241 | | 0.8379 | 0.8379 | | 0.7829 | 0.7829 | | 2,323.4168 | 2,323.4168 | 0.5921 | | 2,338.2191 |
| **Total** | **1.6889** | **16.6217** | **13.9605** | **0.0241** | **1.3028** | **0.8379** | **2.1407** | **0.1973** | **0.7829** | **0.9801** | | **2,323.4168** | **2,323.4168** | **0.5921** | | **2,338.2191** |

### Unmitigated Construction Off-Site

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Hauling | 0.0281 | 1.0126 | 0.2361 | 3.7500e-003 | 0.1055 | 7.5200e-003 | 0.1131 | 0.0289 | 7.2000e-003 | 0.0361 | | 410.4676 | 410.4676 | 0.0218 | 0.0651 | 430.4202 |
| Vendor | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Worker | 0.0450 | 0.0329 | 0.5124 | 1.3300e-003 | 0.1453 | 9.3000e-004 | 0.1462 | 0.0385 | 8.6000e-004 | 0.0394 | | 135.2165 | 135.2165 | 3.6600e-003 | 3.2500e-003 | 136.2774 |
| **Total** | **0.0731** | **1.0455** | **0.7485** | **5.0800e-003** | **0.2509** | **8.4500e-003** | **0.2593** | **0.0675** | **8.0600e-003** | **0.0755** | | **545.6842** | **545.6842** | **0.0255** | **0.0684** | **566.6976** |

## 3.2 Demolition - 2022

### Mitigated Construction On-Site

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Fugitive Dust | | | | | 1.3028 | 0.0000 | 1.3028 | 0.1973 | 0.0000 | 0.1973 | | | 0.0000 | | | 0.0000 |
| Off-Road | 1.6889 | 16.6217 | 13.9605 | 0.0241 | | 0.8379 | 0.8379 | | 0.7829 | 0.7829 | 0.0000 | 2,323.4168 | 2,323.4168 | 0.5921 | | 2,338.2191 |
| **Total** | **1.6889** | **16.6217** | **13.9605** | **0.0241** | **1.3028** | **0.8379** | **2.1407** | **0.1973** | **0.7829** | **0.9801** | **0.0000** | **2,323.4168** | **2,323.4168** | **0.5921** | | **2,338.2191** |

### Mitigated Construction Off-Site

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Hauling | 0.0281 | 1.0126 | 0.2361 | 3.7500e-003 | 0.1055 | 7.5200e-003 | 0.1131 | 0.0289 | 7.2000e-003 | 0.0361 | | 410.4676 | 410.4676 | 0.0218 | 0.0651 | 430.4202 |
| Vendor | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Worker | 0.0450 | 0.0329 | 0.5124 | 1.3300e-003 | 0.1453 | 9.3000e-004 | 0.1462 | 0.0385 | 8.6000e-004 | 0.0394 | | 135.2165 | 135.2165 | 3.6600e-003 | 3.2500e-003 | 136.2774 |
| **Total** | **0.0731** | **1.0455** | **0.7485** | **5.0800e-003** | **0.2509** | **8.4500e-003** | **0.2593** | **0.0675** | **8.0600e-003** | **0.0755** | | **545.6842** | **545.6842** | **0.0255** | **0.0684** | **566.6976** |

## 3.3 Grading - 2022

### Unmitigated Construction On-Site

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Fugitive Dust | | | | | 7.2874 | 0.0000 | 7.2874 | 3.4558 | 0.0000 | 3.4558 | | | 0.0000 | | | 0.0000 |
| Off-Road | 1.5403 | 16.9836 | 9.2202 | 0.0206 | | 0.7423 | 0.7423 | | 0.6829 | 0.6829 | | 1,995.4825 | 1,995.4825 | 0.6454 | | 2,011.6169 |
| **Total** | **1.5403** | **16.9836** | **9.2202** | **0.0206** | **7.2874** | **0.7423** | **8.0297** | **3.4558** | **0.6829** | **4.1387** | | **1,995.4825** | **1,995.4825** | **0.6454** | | **2,011.6169** |

### Unmitigated Construction Off-Site

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Hauling | 1.0549 | 38.0284 | 8.8668 | 0.1407 | 3.9633 | 0.2825 | 4.2459 | 1.0866 | 0.2703 | 1.3569 | | 15,414.7045 | 15,414.7045 | 0.8187 | 2.4457 | 16,164.0039 |
| Vendor | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Worker | 0.0346 | 0.0253 | 0.3941 | 1.0200e-003 | 0.1118 | 7.2000e-004 | 0.1125 | 0.0296 | 6.6000e-004 | 0.0303 | | 104.0127 | 104.0127 | 2.8200e-003 | 2.5000e-003 | 104.8288 |
| **Total** | **1.0895** | **38.0537** | **9.2609** | **0.1417** | **4.0751** | **0.2833** | **4.3584** | **1.1163** | **0.2710** | **1.3872** | | **15,518.7173** | **15,518.7173** | **0.8216** | **2.4482** | **16,268.8327** |

## 3.3 Grading - 2022

**Mitigated Construction On-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Fugitive Dust | | | | | 7.2874 | 0.0000 | 7.2874 | 3.4558 | 0.0000 | 3.4558 | | | 0.0000 | | | 0.0000 |
| Off-Road | 1.5403 | 16.9836 | 9.2202 | 0.0206 | | 0.7423 | 0.7423 | | 0.6829 | 0.6829 | 0.0000 | 1,995.482 5 | 1,995.482 5 | 0.6454 | | 2,011.616 9 |
| **Total** | **1.5403** | **16.9836** | **9.2202** | **0.0206** | **7.2874** | **0.7423** | **8.0297** | **3.4558** | **0.6829** | **4.1387** | **0.0000** | **1,995.482 5** | **1,995.482 5** | **0.6454** | | **2,011.616 9** |

**Mitigated Construction Off-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Hauling | 1.0549 | 38.0284 | 8.8668 | 0.1407 | 3.9633 | 0.2825 | 4.2459 | 1.0866 | 0.2703 | 1.3569 | | 15,414.70 45 | 15,414.70 45 | 0.8187 | 2.4457 | 16,164.00 39 |
| Vendor | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Worker | 0.0346 | 0.0253 | 0.3941 | 1.0200e-003 | 0.1118 | 7.2000e-004 | 0.1125 | 0.0296 | 6.6000e-004 | 0.0303 | | 104.0127 | 104.0127 | 2.8200e-003 | 2.5000e-003 | 104.8288 |
| **Total** | **1.0895** | **38.0537** | **9.2609** | **0.1417** | **4.0751** | **0.2833** | **4.3584** | **1.1163** | **0.2710** | **1.3872** | | **15,518.71 73** | **15,518.71 73** | **0.8216** | **2.4482** | **16,268.83 27** |

## 3.4 Building Construction - 2022

**Unmitigated Construction On-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Off-Road | 1.6487 | 12.5031 | 12.7264 | 0.0221 | | 0.5889 | 0.5889 | | 0.5689 | 0.5689 | | 2,001.5429 | 2,001.5429 | 0.3486 | | 2,010.2581 |
| **Total** | **1.6487** | **12.5031** | **12.7264** | **0.0221** | | **0.5889** | **0.5889** | | **0.5689** | **0.5689** | | **2,001.5429** | **2,001.5429** | **0.3486** | | **2,010.2581** |

**Unmitigated Construction Off-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Hauling | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Vendor | 0.0374 | 0.9307 | 0.3191 | 3.7200e-003 | 0.1217 | 8.8700e-003 | 0.1306 | 0.0350 | 8.4800e-003 | 0.0435 | | 399.8770 | 399.8770 | 0.0134 | 0.0576 | 417.3828 |
| Worker | 0.1523 | 0.1112 | 1.7342 | 4.5000e-003 | 0.4918 | 3.1500e-003 | 0.4950 | 0.1304 | 2.9000e-003 | 0.1333 | | 457.6559 | 457.6559 | 0.0124 | 0.0110 | 461.2466 |
| **Total** | **0.1897** | **1.0419** | **2.0533** | **8.2200e-003** | **0.6135** | **0.0120** | **0.6255** | **0.1655** | **0.0114** | **0.1769** | | **857.5329** | **857.5329** | **0.0258** | **0.0686** | **878.6294** |

## 3.4 Building Construction - 2022

### Mitigated Construction On-Site

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Off-Road | 1.6487 | 12.5031 | 12.7264 | 0.0221 | | 0.5889 | 0.5889 | | 0.5689 | 0.5689 | 0.0000 | 2,001.5429 | 2,001.5429 | 0.3486 | | 2,010.2581 |
| **Total** | **1.6487** | **12.5031** | **12.7264** | **0.0221** | | **0.5889** | **0.5889** | | **0.5689** | **0.5689** | **0.0000** | **2,001.5429** | **2,001.5429** | **0.3486** | | **2,010.2581** |

### Mitigated Construction Off-Site

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Hauling | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Vendor | 0.0374 | 0.9307 | 0.3191 | 3.7200e-003 | 0.1217 | 8.8700e-003 | 0.1306 | 0.0350 | 8.4800e-003 | 0.0435 | | 399.8770 | 399.8770 | 0.0134 | 0.0576 | 417.3828 |
| Worker | 0.1523 | 0.1112 | 1.7342 | 4.5000e-003 | 0.4918 | 3.1500e-003 | 0.4950 | 0.1304 | 2.9000e-003 | 0.1333 | | 457.6559 | 457.6559 | 0.0124 | 0.0110 | 461.2466 |
| **Total** | **0.1897** | **1.0419** | **2.0533** | **8.2200e-003** | **0.6135** | **0.0120** | **0.6255** | **0.1655** | **0.0114** | **0.1769** | | **857.5329** | **857.5329** | **0.0258** | **0.0686** | **878.6294** |

## 3.4 Building Construction - 2023

**Unmitigated Construction On-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Off-Road | 1.5233 | 11.7104 | 12.6111 | 0.0221 | | 0.5145 | 0.5145 | | 0.4968 | 0.4968 | | 2,001.787 7 | 2,001.787 7 | 0.3399 | | 2,010.285 8 |
| **Total** | **1.5233** | **11.7104** | **12.6111** | **0.0221** | | **0.5145** | **0.5145** | | **0.4968** | **0.4968** | | **2,001.787 7** | **2,001.787 7** | **0.3399** | | **2,010.285 8** |

**Unmitigated Construction Off-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Hauling | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Vendor | 0.0219 | 0.7293 | 0.2825 | 3.5400e-003 | 0.1217 | 3.6700e-003 | 0.1254 | 0.0350 | 3.5100e-003 | 0.0386 | | 380.5367 | 380.5367 | 0.0128 | 0.0547 | 397.1591 |
| Worker | 0.1409 | 0.0982 | 1.5944 | 4.3500e-003 | 0.4918 | 2.9700e-003 | 0.4948 | 0.1304 | 2.7300e-003 | 0.1332 | | 445.5496 | 445.5496 | 0.0111 | 0.0102 | 448.8532 |
| **Total** | **0.1628** | **0.8275** | **1.8770** | **7.8900e-003** | **0.6135** | **6.6400e-003** | **0.6202** | **0.1655** | **6.2400e-003** | **0.1717** | | **826.0863** | **826.0863** | **0.0239** | **0.0649** | **846.0123** |

## 3.4 Building Construction - 2023

**Mitigated Construction On-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Off-Road | 1.5233 | 11.7104 | 12.6111 | 0.0221 | | 0.5145 | 0.5145 | | 0.4968 | 0.4968 | 0.0000 | 2,001.7877 | 2,001.7877 | 0.3399 | | 2,010.2858 |
| **Total** | **1.5233** | **11.7104** | **12.6111** | **0.0221** | | **0.5145** | **0.5145** | | **0.4968** | **0.4968** | **0.0000** | **2,001.7877** | **2,001.7877** | **0.3399** | | **2,010.2858** |

**Mitigated Construction Off-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Hauling | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Vendor | 0.0219 | 0.7293 | 0.2825 | 3.5400e-003 | 0.1217 | 3.6700e-003 | 0.1254 | 0.0350 | 3.5100e-003 | 0.0386 | | 380.5367 | 380.5367 | 0.0128 | 0.0547 | 397.1591 |
| Worker | 0.1409 | 0.0982 | 1.5944 | 4.3500e-003 | 0.4918 | 2.9700e-003 | 0.4948 | 0.1304 | 2.7300e-003 | 0.1332 | | 445.5496 | 445.5496 | 0.0111 | 0.0102 | 448.8532 |
| **Total** | **0.1628** | **0.8275** | **1.8770** | **7.8900e-003** | **0.6135** | **6.6400e-003** | **0.6202** | **0.1655** | **6.2400e-003** | **0.1717** | | **826.0863** | **826.0863** | **0.0239** | **0.0649** | **846.0123** |

## 3.4 Building Construction - 2024

### Unmitigated Construction On-Site

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Off-Road | 1.4200 | 11.0639 | 12.5172 | 0.0221 | | 0.4506 | 0.4506 | | 0.4348 | 0.4348 | | 2,001.9214 | 2,001.9214 | 0.3334 | | 2,010.2563 |
| **Total** | **1.4200** | **11.0639** | **12.5172** | **0.0221** | | **0.4506** | **0.4506** | | **0.4348** | **0.4348** | | **2,001.9214** | **2,001.9214** | **0.3334** | | **2,010.2563** |

### Unmitigated Construction Off-Site

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Hauling | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Vendor | 0.0212 | 0.7308 | 0.2765 | 3.4800e-003 | 0.1217 | 3.6900e-003 | 0.1254 | 0.0350 | 3.5300e-003 | 0.0386 | | 374.8218 | 374.8218 | 0.0128 | 0.0540 | 391.2176 |
| Worker | 0.1313 | 0.0877 | 1.4841 | 4.2300e-003 | 0.4918 | 2.8500e-003 | 0.4947 | 0.1304 | 2.6200e-003 | 0.1331 | | 436.3652 | 436.3652 | 0.0100 | 9.4400e-003 | 439.4304 |
| **Total** | **0.1525** | **0.8185** | **1.7606** | **7.7100e-003** | **0.6135** | **6.5400e-003** | **0.6201** | **0.1655** | **6.1500e-003** | **0.1716** | | **811.1869** | **811.1869** | **0.0228** | **0.0634** | **830.6480** |

## 3.4 Building Construction - 2024

**Mitigated Construction On-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Off-Road | 1.4200 | 11.0639 | 12.5172 | 0.0221 | | 0.4506 | 0.4506 | | 0.4348 | 0.4348 | 0.0000 | 2,001.9214 | 2,001.9214 | 0.3334 | | 2,010.2563 |
| **Total** | **1.4200** | **11.0639** | **12.5172** | **0.0221** | | **0.4506** | **0.4506** | | **0.4348** | **0.4348** | **0.0000** | **2,001.9214** | **2,001.9214** | **0.3334** | | **2,010.2563** |

**Mitigated Construction Off-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Hauling | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Vendor | 0.0212 | 0.7308 | 0.2765 | 3.4800e-003 | 0.1217 | 3.6900e-003 | 0.1254 | 0.0350 | 3.5300e-003 | 0.0386 | | 374.8218 | 374.8218 | 0.0128 | 0.0540 | 391.2176 |
| Worker | 0.1313 | 0.0877 | 1.4841 | 4.2300e-003 | 0.4918 | 2.8500e-003 | 0.4947 | 0.1304 | 2.6200e-003 | 0.1331 | | 436.3652 | 436.3652 | 0.0100 | 9.4400e-003 | 439.4304 |
| **Total** | **0.1525** | **0.8185** | **1.7606** | **7.7100e-003** | **0.6135** | **6.5400e-003** | **0.6201** | **0.1655** | **6.1500e-003** | **0.1716** | | **811.1869** | **811.1869** | **0.0228** | **0.0634** | **830.6480** |

## 3.5 Paving - 2024

**Unmitigated Construction On-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Off-Road | 0.6180 | 5.8607 | 8.8253 | 0.0136 | | 0.2810 | 0.2810 | | 0.2594 | 0.2594 | | 1,297.8688 | 1,297.8688 | 0.4114 | | 1,308.1547 |
| Paving | 0.0000 | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | | | 0.0000 | | | 0.0000 |
| **Total** | **0.6180** | **5.8607** | **8.8253** | **0.0136** | | **0.2810** | **0.2810** | | **0.2594** | **0.2594** | | **1,297.8688** | **1,297.8688** | **0.4114** | | **1,308.1547** |

**Unmitigated Construction Off-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Hauling | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Vendor | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Worker | 0.0388 | 0.0259 | 0.4385 | 1.2500e-003 | 0.1453 | 8.4000e-004 | 0.1462 | 0.0385 | 7.7000e-004 | 0.0393 | | 128.9261 | 128.9261 | 2.9700e-003 | 2.7900e-003 | 129.8317 |
| **Total** | **0.0388** | **0.0259** | **0.4385** | **1.2500e-003** | **0.1453** | **8.4000e-004** | **0.1462** | **0.0385** | **7.7000e-004** | **0.0393** | | **128.9261** | **128.9261** | **2.9700e-003** | **2.7900e-003** | **129.8317** |

## 3.5 Paving - 2024

**Mitigated Construction On-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Off-Road | 0.6180 | 5.8607 | 8.8253 | 0.0136 | | 0.2810 | 0.2810 | | 0.2594 | 0.2594 | 0.0000 | 1,297.868 8 | 1,297.868 8 | 0.4114 | | 1,308.154 7 |
| Paving | 0.0000 | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | | | 0.0000 | | | 0.0000 |
| **Total** | **0.6180** | **5.8607** | **8.8253** | **0.0136** | | **0.2810** | **0.2810** | | **0.2594** | **0.2594** | **0.0000** | **1,297.868 8** | **1,297.868 8** | **0.4114** | | **1,308.154 7** |

**Mitigated Construction Off-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Hauling | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Vendor | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Worker | 0.0388 | 0.0259 | 0.4385 | 1.2500e-003 | 0.1453 | 8.4000e-004 | 0.1462 | 0.0385 | 7.7000e-004 | 0.0393 | | 128.9261 | 128.9261 | 2.9700e-003 | 2.7900e-003 | 129.8317 |
| **Total** | **0.0388** | **0.0259** | **0.4385** | **1.2500e-003** | **0.1453** | **8.4000e-004** | **0.1462** | **0.0385** | **7.7000e-004** | **0.0393** | | **128.9261** | **128.9261** | **2.9700e-003** | **2.7900e-003** | **129.8317** |

## 3.6 Architectural Coating - 2024

### Unmitigated Construction On-Site

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Archit. Coating | 31.4558 | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | | | 0.0000 | | | 0.0000 |
| Off-Road | 0.1808 | 1.2188 | 1.8101 | 2.9700e-003 | | 0.0609 | 0.0609 | | 0.0609 | 0.0609 | | 281.4481 | 281.4481 | 0.0159 | | 281.8443 |
| **Total** | **31.6366** | **1.2188** | **1.8101** | **2.9700e-003** | | **0.0609** | **0.0609** | | **0.0609** | **0.0609** | | **281.4481** | **281.4481** | **0.0159** | | **281.8443** |

### Unmitigated Construction Off-Site

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Hauling | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Vendor | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Worker | 0.0269 | 0.0179 | 0.3036 | 8.7000e-004 | 0.1006 | 5.8000e-004 | 0.1012 | 0.0267 | 5.4000e-004 | 0.0272 | | 89.2565 | 89.2565 | 2.0500e-003 | 1.9300e-003 | 89.8835 |
| **Total** | **0.0269** | **0.0179** | **0.3036** | **8.7000e-004** | **0.1006** | **5.8000e-004** | **0.1012** | **0.0267** | **5.4000e-004** | **0.0272** | | **89.2565** | **89.2565** | **2.0500e-003** | **1.9300e-003** | **89.8835** |

## 3.6 Architectural Coating - 2024

**Mitigated Construction On-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Archit. Coating | 31.4558 | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | | | 0.0000 | | | 0.0000 |
| Off-Road | 0.1808 | 1.2188 | 1.8101 | 2.9700e-003 | | 0.0609 | 0.0609 | | 0.0609 | 0.0609 | 0.0000 | 281.4481 | 281.4481 | 0.0159 | | 281.8443 |
| **Total** | **31.6366** | **1.2188** | **1.8101** | **2.9700e-003** | | **0.0609** | **0.0609** | | **0.0609** | **0.0609** | **0.0000** | **281.4481** | **281.4481** | **0.0159** | | **281.8443** |

**Mitigated Construction Off-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Hauling | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Vendor | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Worker | 0.0269 | 0.0179 | 0.3036 | 8.7000e-004 | 0.1006 | 5.8000e-004 | 0.1012 | 0.0267 | 5.4000e-004 | 0.0272 | | 89.2565 | 89.2565 | 2.0500e-003 | 1.9300e-003 | 89.8835 |
| **Total** | **0.0269** | **0.0179** | **0.3036** | **8.7000e-004** | **0.1006** | **5.8000e-004** | **0.1012** | **0.0267** | **5.4000e-004** | **0.0272** | | **89.2565** | **89.2565** | **2.0500e-003** | **1.9300e-003** | **89.8835** |

# 4.0 Operational Detail - Mobile

## 4.1 Mitigation Measures Mobile

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Mitigated | 2.2415 | 2.2403 | 22.5245 | 0.0498 | 5.1956 | 0.0355 | 5.2311 | 1.3839 | 0.0330 | 1.4169 | | 5,161.0702 | 5,161.0702 | 0.3334 | 0.2049 | 5,230.4538 |
| Unmitigated | 2.2415 | 2.2403 | 22.5245 | 0.0498 | 5.1956 | 0.0355 | 5.2311 | 1.3839 | 0.0330 | 1.4169 | | 5,161.0702 | 5,161.0702 | 0.3334 | 0.2049 | 5,230.4538 |

## 4.2 Trip Summary Information

| | Average Daily Trip Rate | | | Unmitigated | Mitigated |
|---|---|---|---|---|---|
| Land Use | Weekday | Saturday | Sunday | Annual VMT | Annual VMT |
| General Office Building | 766.04 | 766.04 | 766.04 | 2,467,779 | 2,467,779 |
| Parking Lot | 0.00 | 0.00 | 0.00 | | |
| Strip Mall | 0.00 | 0.00 | 0.00 | | |
| Total | 766.04 | 766.04 | 766.04 | 2,467,779 | 2,467,779 |

## 4.3 Trip Type Information

| | Miles | | | Trip % | | | Trip Purpose % | | |
|---|---|---|---|---|---|---|---|---|---|
| Land Use | H-W or C-W | H-S or C-C | H-O or C-NW | H-W or C-W | H-S or C-C | H-O or C-NW | Primary | Diverted | Pass-by |
| General Office Building | 16.60 | 8.40 | 6.90 | 33.00 | 48.00 | 19.00 | 77 | 19 | 4 |
| Parking Lot | 16.60 | 8.40 | 6.90 | 0.00 | 0.00 | 0.00 | 0 | 0 | 0 |
| Strip Mall | 16.60 | 8.40 | 6.90 | 16.60 | 64.40 | 19.00 | 45 | 40 | 15 |

### 4.4 Fleet Mix

| Land Use | LDA | LDT1 | LDT2 | MDV | LHD1 | LHD2 | MHD | HHD | OBUS | UBUS | MCY | SBUS | MH |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| General Office Building | 0.542464 | 0.063735 | 0.188241 | 0.126899 | 0.023249 | 0.006239 | 0.010717 | 0.008079 | 0.000923 | 0.000604 | 0.024795 | 0.000702 | 0.003352 |
| Parking Lot | 0.542464 | 0.063735 | 0.188241 | 0.126899 | 0.023249 | 0.006239 | 0.010717 | 0.008079 | 0.000923 | 0.000604 | 0.024795 | 0.000702 | 0.003352 |
| Strip Mall | 0.542464 | 0.063735 | 0.188241 | 0.126899 | 0.023249 | 0.006239 | 0.010717 | 0.008079 | 0.000923 | 0.000604 | 0.024795 | 0.000702 | 0.003352 |

## 5.0 Energy Detail

Historical Energy Use: N

### 5.1 Mitigation Measures Energy

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| NaturalGas Mitigated | 0.0169 | 0.1534 | 0.1289 | 9.2000e-004 | | 0.0117 | 0.0117 | | 0.0117 | 0.0117 | | 184.0781 | 184.0781 | 3.5300e-003 | 3.3700e-003 | 185.1720 |
| NaturalGas Unmitigated | 0.0169 | 0.1534 | 0.1289 | 9.2000e-004 | | 0.0117 | 0.0117 | | 0.0117 | 0.0117 | | 184.0781 | 184.0781 | 3.5300e-003 | 3.3700e-003 | 185.1720 |

## 5.2 Energy by Land Use - NaturalGas

**Unmitigated**

| | NaturalGas Use | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Land Use | kBTU/yr | lb/day | | | | | | | | | | lb/day | | | | | |
| General Office Building | 1562.43 | 0.0169 | 0.1532 | 0.1287 | 9.2000e-004 | | 0.0116 | 0.0116 | | 0.0116 | 0.0116 | | 183.8154 | 183.8154 | 3.5200e-003 | 3.3700e-003 | 184.9077 |
| Parking Lot | 0 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Strip Mall | 2.23288 | 2.0000e-005 | 2.2000e-004 | 1.8000e-004 | 0.0000 | | 2.0000e-005 | 2.0000e-005 | | 2.0000e-005 | 2.0000e-005 | | 0.2627 | 0.2627 | 1.0000e-005 | 0.0000 | 0.2643 |
| **Total** | | **0.0169** | **0.1534** | **0.1289** | **9.2000e-004** | | **0.0117** | **0.0117** | | **0.0117** | **0.0117** | | **184.0781** | **184.0781** | **3.5300e-003** | **3.3700e-003** | **185.1720** |

## 5.2 Energy by Land Use - NaturalGas

**Mitigated**

| | NaturalGas Use | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Land Use | kBTU/yr | lb/day | | | | | | | | | | lb/day | | | | | |
| General Office Building | 1.56243 | 0.0169 | 0.1532 | 0.1287 | 9.2000e-004 | | 0.0116 | 0.0116 | | 0.0116 | 0.0116 | | 183.8154 | 183.8154 | 3.5200e-003 | 3.3700e-003 | 184.9077 |
| Parking Lot | 0 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Strip Mall | 0.00223288 | 2.0000e-005 | 2.2000e-004 | 1.8000e-004 | 0.0000 | | 2.0000e-005 | 2.0000e-005 | | 2.0000e-005 | 2.0000e-005 | | 0.2627 | 0.2627 | 1.0000e-005 | 0.0000 | 0.2643 |
| **Total** | | **0.0169** | **0.1534** | **0.1289** | **9.2000e-004** | | **0.0117** | **0.0117** | | **0.0117** | **0.0117** | | **184.0781** | **184.0781** | **3.5300e-003** | **3.3700e-003** | **185.1720** |

# 6.0 Area Detail

## 6.1 Mitigation Measures Area

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Mitigated | 1.2757 | 2.0000e-004 | 0.0216 | 0.0000 | | 8.0000e-005 | 8.0000e-005 | | 8.0000e-005 | 8.0000e-005 | | 0.0464 | 0.0464 | 1.2000e-004 | | 0.0494 |
| Unmitigated | 1.2757 | 2.0000e-004 | 0.0216 | 0.0000 | | 8.0000e-005 | 8.0000e-005 | | 8.0000e-005 | 8.0000e-005 | | 0.0464 | 0.0464 | 1.2000e-004 | | 0.0494 |

## 6.2 Area by SubCategory

**Unmitigated**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SubCategory | lb/day | | | | | | | | | | lb/day | | | | | |
| Architectural Coating | 0.1465 | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | | | 0.0000 | | | 0.0000 |
| Consumer Products | 1.1272 | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | | | 0.0000 | | | 0.0000 |
| Landscaping | 1.9900e-003 | 2.0000e-004 | 0.0216 | 0.0000 | | 8.0000e-005 | 8.0000e-005 | | 8.0000e-005 | 8.0000e-005 | | 0.0464 | 0.0464 | 1.2000e-004 | | 0.0494 |
| **Total** | **1.2757** | **2.0000e-004** | **0.0216** | **0.0000** | | **8.0000e-005** | **8.0000e-005** | | **8.0000e-005** | **8.0000e-005** | | **0.0464** | **0.0464** | **1.2000e-004** | | **0.0494** |

## 6.2 Area by SubCategory

**Mitigated**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SubCategory | lb/day | | | | | | | | | | lb/day | | | | | |
| Architectural Coating | 0.1465 | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | | | 0.0000 | | | 0.0000 |
| Consumer Products | 1.1272 | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | | | 0.0000 | | | 0.0000 |
| Landscaping | 1.9900e-003 | 2.0000e-004 | 0.0216 | 0.0000 | | 8.0000e-005 | 8.0000e-005 | | 8.0000e-005 | 8.0000e-005 | | 0.0464 | 0.0464 | 1.2000e-004 | | 0.0494 |
| **Total** | **1.2757** | **2.0000e-004** | **0.0216** | **0.0000** | | **8.0000e-005** | **8.0000e-005** | | **8.0000e-005** | **8.0000e-005** | | **0.0464** | **0.0464** | **1.2000e-004** | | **0.0494** |

# 7.0 Water Detail

## 7.1 Mitigation Measures Water

## 8.0 Waste Detail

### 8.1 Mitigation Measures Waste

## 9.0 Operational Offroad

| Equipment Type | Number | Hours/Day | Days/Year | Horse Power | Load Factor | Fuel Type |
|---|---|---|---|---|---|---|

## 10.0 Stationary Equipment

**Fire Pumps and Emergency Generators**

| Equipment Type | Number | Hours/Day | Hours/Year | Horse Power | Load Factor | Fuel Type |
|---|---|---|---|---|---|---|

**Boilers**

| Equipment Type | Number | Heat Input/Day | Heat Input/Year | Boiler Rating | Fuel Type |
|---|---|---|---|---|---|

**User Defined Equipment**

| Equipment Type | Number |
|---|---|

## 11.0 Vegetation

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied**

# 1200 Cahuenga Project

**Los Angeles-South Coast County, Winter**

## 1.0 Project Characteristics

### 1.1 Land Usage

| Land Uses | Size | Metric | Lot Acreage | Floor Surface Area | Population |
|---|---|---|---|---|---|
| General Office Building | 55.31 | 1000sqft | 1.22 | 55,314.00 | 0 |
| Parking Lot | 156.00 | Space | 0.00 | 62,400.00 | 0 |
| Strip Mall | 0.50 | 1000sqft | 0.01 | 500.00 | 0 |

### 1.2 Other Project Characteristics

| | | | | | |
|---|---|---|---|---|---|
| **Urbanization** | Urban | **Wind Speed (m/s)** | 2.2 | **Precipitation Freq (Days)** | 33 |
| **Climate Zone** | 11 | | | **Operational Year** | 2024 |
| **Utility Company** | Southern California Edison | | | | |
| **CO2 Intensity (lb/MWhr)** | 390.98 | **CH4 Intensity (lb/MWhr)** | 0.033 | **N2O Intensity (lb/MWhr)** | 0.004 |

### 1.3 User Entered Comments & Non-Default Data

Project Characteristics - Consistent with the IS/MND's model.

Land Use - Consistent with the IS/MND's model.

Construction Phase - Consistent with the IS/MND's model.

Trips and VMT - See SWAPE's comment on "Underestimated Number of Operational Vehicle Trips"

Grading - Consistent with the IS/MND's model.

Vehicle Trips - See SWAPE's comment on "Underestimated Number of Operational Vehicle Trips".

Construction Off-road Equipment Mitigation - Consistent with the IS/MND's model.

Demolition -

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied**

| Table Name | Column Name | Default Value | New Value |
|---|---|---|---|
| tblConstructionPhase | NumDays | 10.00 | 17.00 |
| tblConstructionPhase | NumDays | 200.00 | 336.00 |
| tblConstructionPhase | NumDays | 20.00 | 34.00 |
| tblConstructionPhase | NumDays | 4.00 | 7.00 |
| tblConstructionPhase | NumDays | 10.00 | 17.00 |
| tblGrading | MaterialExported | 0.00 | 12,678.00 |
| tblLandUse | LandUseSquareFeet | 55,310.00 | 55,314.00 |
| tblLandUse | LotAcreage | 1.27 | 1.22 |
| tblLandUse | LotAcreage | 1.40 | 0.00 |
| tblVehicleTrips | ST_TR | 2.21 | 13.85 |
| tblVehicleTrips | ST_TR | 42.04 | 0.00 |
| tblVehicleTrips | SU_TR | 0.70 | 13.85 |
| tblVehicleTrips | SU_TR | 20.43 | 0.00 |
| tblVehicleTrips | WD_TR | 9.74 | 13.85 |
| tblVehicleTrips | WD_TR | 44.32 | 0.00 |

## 2.0 Emissions Summary

## 2.1 Overall Construction (Maximum Daily Emission)

**Unmitigated Construction**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Year | lb/day | | | | | | | | | | lb/day | | | | | |
| 2022 | 2.6070 | 56.5832 | 18.6049 | 0.1623 | 11.3625 | 1.0261 | 12.3886 | 4.5720 | 0.9544 | 5.5264 | 0.0000 | 17,513.2191 | 17,513.2191 | 1.4656 | 2.4492 | 18,279.7248 |
| 2023 | 1.6958 | 12.5824 | 14.3680 | 0.0297 | 0.6135 | 0.5212 | 1.1347 | 0.1655 | 0.5031 | 0.6686 | 0.0000 | 2,805.0260 | 2,805.0260 | 0.3639 | 0.0657 | 2,833.7022 |
| 2024 | 31.6656 | 11.9258 | 14.1678 | 0.0296 | 0.6135 | 0.4571 | 1.0707 | 0.1655 | 0.4410 | 0.6064 | 0.0000 | 2,790.7862 | 2,790.7862 | 0.4145 | 0.0642 | 2,818.8174 |
| **Maximum** | **31.6656** | **56.5832** | **18.6049** | **0.1623** | **11.3625** | **1.0261** | **12.3886** | **4.5720** | **0.9544** | **5.5264** | **0.0000** | **17,513.2191** | **17,513.2191** | **1.4656** | **2.4492** | **18,279.7248** |

**Mitigated Construction**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Year | lb/day | | | | | | | | | | lb/day | | | | | |
| 2022 | 2.6070 | 56.5832 | 18.6049 | 0.1623 | 11.3625 | 1.0261 | 12.3886 | 4.5720 | 0.9544 | 5.5264 | 0.0000 | 17,513.2191 | 17,513.2191 | 1.4656 | 2.4492 | 18,279.7248 |
| 2023 | 1.6958 | 12.5824 | 14.3680 | 0.0297 | 0.6135 | 0.5212 | 1.1347 | 0.1655 | 0.5031 | 0.6686 | 0.0000 | 2,805.0260 | 2,805.0260 | 0.3639 | 0.0657 | 2,833.7022 |
| 2024 | 31.6656 | 11.9258 | 14.1678 | 0.0296 | 0.6135 | 0.4571 | 1.0707 | 0.1655 | 0.4410 | 0.6064 | 0.0000 | 2,790.7862 | 2,790.7862 | 0.4145 | 0.0642 | 2,818.8174 |
| **Maximum** | **31.6656** | **56.5832** | **18.6049** | **0.1623** | **11.3625** | **1.0261** | **12.3886** | **4.5720** | **0.9544** | **5.5264** | **0.0000** | **17,513.2191** | **17,513.2191** | **1.4656** | **2.4492** | **18,279.7248** |

## EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio-CO2 | Total CO2 | CH4 | N20 | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Percent Reduction | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

## 2.2 Overall Operational

### Unmitigated Operational

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Area | 1.2757 | 2.0000e-004 | 0.0216 | 0.0000 | | 8.0000e-005 | 8.0000e-005 | | 8.0000e-005 | 8.0000e-005 | | 0.0464 | 0.0464 | 1.2000e-004 | | 0.0494 |
| Energy | 0.0169 | 0.1534 | 0.1289 | 9.2000e-004 | | 0.0117 | 0.0117 | | 0.0117 | 0.0117 | | 184.0781 | 184.0781 | 3.5300e-003 | 3.3700e-003 | 185.1720 |
| Mobile | 2.2006 | 2.4193 | 22.0597 | 0.0477 | 5.1956 | 0.0355 | 5.2311 | 1.3839 | 0.0330 | 1.4169 | | 4,942.0188 | 4,942.0188 | 0.3430 | 0.2139 | 5,014.3416 |
| **Total** | **3.4932** | **2.5729** | **22.2102** | **0.0486** | **5.1956** | **0.0473** | **5.2428** | **1.3839** | **0.0447** | **1.4287** | | **5,126.1433** | **5,126.1433** | **0.3466** | **0.2173** | **5,199.5630** |

### Mitigated Operational

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Area | 1.2757 | 2.0000e-004 | 0.0216 | 0.0000 | | 8.0000e-005 | 8.0000e-005 | | 8.0000e-005 | 8.0000e-005 | | 0.0464 | 0.0464 | 1.2000e-004 | | 0.0494 |
| Energy | 0.0169 | 0.1534 | 0.1289 | 9.2000e-004 | | 0.0117 | 0.0117 | | 0.0117 | 0.0117 | | 184.0781 | 184.0781 | 3.5300e-003 | 3.3700e-003 | 185.1720 |
| Mobile | 2.2006 | 2.4193 | 22.0597 | 0.0477 | 5.1956 | 0.0355 | 5.2311 | 1.3839 | 0.0330 | 1.4169 | | 4,942.0188 | 4,942.0188 | 0.3430 | 0.2139 | 5,014.3416 |
| **Total** | **3.4932** | **2.5729** | **22.2102** | **0.0486** | **5.1956** | **0.0473** | **5.2428** | **1.3839** | **0.0447** | **1.4287** | | **5,126.1433** | **5,126.1433** | **0.3466** | **0.2173** | **5,199.5630** |

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio-CO2 | Total CO2 | CH4 | N20 | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Percent Reduction | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

## 3.0 Construction Detail

### Construction Phase

| Phase Number | Phase Name | Phase Type | Start Date | End Date | Num Days Week | Num Days | Phase Description |
|---|---|---|---|---|---|---|---|
| 1 | Demolition | Demolition | 9/1/2022 | 10/18/2022 | 5 | 34 | |
| 2 | Grading | Grading | 10/19/2022 | 10/27/2022 | 5 | 7 | |
| 3 | Building Construction | Building Construction | 10/28/2022 | 2/9/2024 | 5 | 336 | |
| 4 | Paving | Paving | 2/10/2024 | 3/5/2024 | 5 | 17 | |
| 5 | Architectural Coating | Architectural Coating | 3/6/2024 | 3/28/2024 | 5 | 17 | |

**Acres of Grading (Site Preparation Phase): 0**

**Acres of Grading (Grading Phase): 7**

**Acres of Paving: 0**

**Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 83,721; Non-Residential Outdoor: 27,907; Striped Parking Area: 3,744 (Architectural Coating – sqft)**

### OffRoad Equipment

| Phase Name | Offroad Equipment Type | Amount | Usage Hours | Horse Power | Load Factor |
|---|---|---|---|---|---|
| Demolition | Concrete/Industrial Saws | 1 | 8.00 | 81 | 0.73 |
| Demolition | Rubber Tired Dozers | 1 | 8.00 | 247 | 0.40 |
| Demolition | Tractors/Loaders/Backhoes | 3 | 8.00 | 97 | 0.37 |
| Grading | Graders | 1 | 8.00 | 187 | 0.41 |
| Grading | Rubber Tired Dozers | 1 | 8.00 | 247 | 0.40 |
| Grading | Tractors/Loaders/Backhoes | 2 | 7.00 | 97 | 0.37 |

| | | | | | |
|---|---|---|---|---|---|
| Building Construction | Cranes | 1 | 6.00 | 231 | 0.29 |
| Building Construction | Forklifts | 1 | 6.00 | 89 | 0.20 |
| Building Construction | Generator Sets | 1 | 8.00 | 84 | 0.74 |
| Building Construction | Tractors/Loaders/Backhoes | 1 | 6.00 | 97 | 0.37 |
| Building Construction | Welders | 3 | 8.00 | 46 | 0.45 |
| Paving | Cement and Mortar Mixers | 1 | 6.00 | 9 | 0.56 |
| Paving | Pavers | 1 | 6.00 | 130 | 0.42 |
| Paving | Paving Equipment | 1 | 8.00 | 132 | 0.36 |
| Paving | Rollers | 1 | 7.00 | 80 | 0.38 |
| Paving | Tractors/Loaders/Backhoes | 1 | 8.00 | 97 | 0.37 |
| Architectural Coating | Air Compressors | 1 | 6.00 | 78 | 0.48 |

**Trips and VMT**

| Phase Name | Offroad Equipment Count | Worker Trip Number | Vendor Trip Number | Hauling Trip Number | Worker Trip Length | Vendor Trip Length | Hauling Trip Length | Worker Vehicle Class | Vendor Vehicle Class | Hauling Vehicle Class |
|---|---|---|---|---|---|---|---|---|---|---|
| Demolition | 5 | 13.00 | 0.00 | 205.00 | 14.70 | 6.90 | 20.00 | LD_Mix | HDT_Mix | HHDT |
| Grading | 4 | 10.00 | 0.00 | 1,585.00 | 14.70 | 6.90 | 20.00 | LD_Mix | HDT_Mix | HHDT |
| Building Construction | 7 | 44.00 | 19.00 | 0.00 | 14.70 | 6.90 | 20.00 | LD_Mix | HDT_Mix | HHDT |
| Paving | 5 | 13.00 | 0.00 | 0.00 | 14.70 | 6.90 | 20.00 | LD_Mix | HDT_Mix | HHDT |
| Architectural Coating | 1 | 9.00 | 0.00 | 0.00 | 14.70 | 6.90 | 20.00 | LD_Mix | HDT_Mix | HHDT |

## 3.1 Mitigation Measures Construction

Water Exposed Area

## 3.2 Demolition - 2022

### Unmitigated Construction On-Site

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Fugitive Dust | | | | | 1.3028 | 0.0000 | 1.3028 | 0.1973 | 0.0000 | 0.1973 | | | 0.0000 | | | 0.0000 |
| Off-Road | 1.6889 | 16.6217 | 13.9605 | 0.0241 | | 0.8379 | 0.8379 | | 0.7829 | 0.7829 | | 2,323.4168 | 2,323.4168 | 0.5921 | | 2,338.2191 |
| **Total** | **1.6889** | **16.6217** | **13.9605** | **0.0241** | **1.3028** | **0.8379** | **2.1407** | **0.1973** | **0.7829** | **0.9801** | | **2,323.4168** | **2,323.4168** | **0.5921** | | **2,338.2191** |

### Unmitigated Construction Off-Site

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Hauling | 0.0274 | 1.0537 | 0.2403 | 3.7500e-003 | 0.1055 | 7.5400e-003 | 0.1131 | 0.0289 | 7.2100e-003 | 0.0362 | | 410.5880 | 410.5880 | 0.0218 | 0.0652 | 430.5460 |
| Vendor | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Worker | 0.0482 | 0.0363 | 0.4704 | 1.2600e-003 | 0.1453 | 9.3000e-004 | 0.1462 | 0.0385 | 8.6000e-004 | 0.0394 | | 128.0673 | 128.0673 | 3.7000e-003 | 3.4800e-003 | 129.1958 |
| **Total** | **0.0756** | **1.0900** | **0.7107** | **5.0100e-003** | **0.2509** | **8.4700e-003** | **0.2593** | **0.0675** | **8.0700e-003** | **0.0755** | | **538.6553** | **538.6553** | **0.0255** | **0.0686** | **559.7417** |

## 3.2 Demolition - 2022

**Mitigated Construction On-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | | | | | | lb/day | | | | | | | lb/day | | | |
| Fugitive Dust | | | | | 1.3028 | 0.0000 | 1.3028 | 0.1973 | 0.0000 | 0.1973 | | | 0.0000 | | | 0.0000 |
| Off-Road | 1.6889 | 16.6217 | 13.9605 | 0.0241 | | 0.8379 | 0.8379 | | 0.7829 | 0.7829 | 0.0000 | 2,323.416 8 | 2,323.416 8 | 0.5921 | | 2,338.219 1 |
| **Total** | **1.6889** | **16.6217** | **13.9605** | **0.0241** | **1.3028** | **0.8379** | **2.1407** | **0.1973** | **0.7829** | **0.9801** | **0.0000** | **2,323.416 8** | **2,323.416 8** | **0.5921** | | **2,338.219 1** |

**Mitigated Construction Off-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | | | | | | lb/day | | | | | | | lb/day | | | |
| Hauling | 0.0274 | 1.0537 | 0.2403 | 3.7500e-003 | 0.1055 | 7.5400e-003 | 0.1131 | 0.0289 | 7.2100e-003 | 0.0362 | | 410.5880 | 410.5880 | 0.0218 | 0.0652 | 430.5460 |
| Vendor | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Worker | 0.0482 | 0.0363 | 0.4704 | 1.2600e-003 | 0.1453 | 9.3000e-004 | 0.1462 | 0.0385 | 8.6000e-004 | 0.0394 | | 128.0673 | 128.0673 | 3.7000e-003 | 3.4800e-003 | 129.1958 |
| **Total** | **0.0756** | **1.0900** | **0.7107** | **5.0100e-003** | **0.2509** | **8.4700e-003** | **0.2593** | **0.0675** | **8.0700e-003** | **0.0755** | | **538.6553** | **538.6553** | **0.0255** | **0.0686** | **559.7417** |

## 3.3 Grading - 2022

**Unmitigated Construction On-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Fugitive Dust | | | | | 7.2874 | 0.0000 | 7.2874 | 3.4558 | 0.0000 | 3.4558 | | | 0.0000 | | | 0.0000 |
| Off-Road | 1.5403 | 16.9836 | 9.2202 | 0.0206 | | 0.7423 | 0.7423 | | 0.6829 | 0.6829 | | 1,995.4825 | 1,995.4825 | 0.6454 | | 2,011.6169 |
| **Total** | **1.5403** | **16.9836** | **9.2202** | **0.0206** | **7.2874** | **0.7423** | **8.0297** | **3.4558** | **0.6829** | **4.1387** | | **1,995.4825** | **1,995.4825** | **0.6454** | | **2,011.6169** |

**Unmitigated Construction Off-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Hauling | 1.0296 | 39.5717 | 9.0229 | 0.1408 | 3.9633 | 0.2831 | 4.2465 | 1.0866 | 0.2709 | 1.3575 | | 15,419.2234 | 15,419.2234 | 0.8174 | 2.4465 | 16,168.7265 |
| Vendor | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Worker | 0.0371 | 0.0279 | 0.3619 | 9.7000e-004 | 0.1118 | 7.2000e-004 | 0.1125 | 0.0296 | 6.6000e-004 | 0.0303 | | 98.5133 | 98.5133 | 2.8500e-003 | 2.6700e-003 | 99.3813 |
| **Total** | **1.0666** | **39.5996** | **9.3848** | **0.1417** | **4.0751** | **0.2838** | **4.3589** | **1.1163** | **0.2715** | **1.3878** | | **15,517.7367** | **15,517.7367** | **0.8202** | **2.4492** | **16,268.1079** |

## 3.3 Grading - 2022

**Mitigated Construction On-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Fugitive Dust | | | | | 7.2874 | 0.0000 | 7.2874 | 3.4558 | 0.0000 | 3.4558 | | | 0.0000 | | | 0.0000 |
| Off-Road | 1.5403 | 16.9836 | 9.2202 | 0.0206 | | 0.7423 | 0.7423 | | 0.6829 | 0.6829 | 0.0000 | 1,995.4825 | 1,995.4825 | 0.6454 | | 2,011.6169 |
| **Total** | **1.5403** | **16.9836** | **9.2202** | **0.0206** | **7.2874** | **0.7423** | **8.0297** | **3.4558** | **0.6829** | **4.1387** | **0.0000** | **1,995.4825** | **1,995.4825** | **0.6454** | | **2,011.6169** |

**Mitigated Construction Off-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Hauling | 1.0296 | 39.5717 | 9.0229 | 0.1408 | 3.9633 | 0.2831 | 4.2465 | 1.0866 | 0.2709 | 1.3575 | | 15,419.2234 | 15,419.2234 | 0.8174 | 2.4465 | 16,168.7265 |
| Vendor | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Worker | 0.0371 | 0.0279 | 0.3619 | 9.7000e-004 | 0.1118 | 7.2000e-004 | 0.1125 | 0.0296 | 6.6000e-004 | 0.0303 | | 98.5133 | 98.5133 | 2.8500e-003 | 2.6700e-003 | 99.3813 |
| **Total** | **1.0666** | **39.5996** | **9.3848** | **0.1417** | **4.0751** | **0.2838** | **4.3589** | **1.1163** | **0.2715** | **1.3878** | | **15,517.7367** | **15,517.7367** | **0.8202** | **2.4492** | **16,268.1079** |

## 3.4 Building Construction - 2022

### Unmitigated Construction On-Site

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Off-Road | 1.6487 | 12.5031 | 12.7264 | 0.0221 | | 0.5889 | 0.5889 | | 0.5689 | 0.5689 | | 2,001.5429 | 2,001.5429 | 0.3486 | | 2,010.2581 |
| **Total** | **1.6487** | **12.5031** | **12.7264** | **0.0221** | | **0.5889** | **0.5889** | | **0.5689** | **0.5689** | | **2,001.5429** | **2,001.5429** | **0.3486** | | **2,010.2581** |

### Unmitigated Construction Off-Site

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Hauling | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Vendor | 0.0369 | 0.9691 | 0.3301 | 3.7200e-003 | 0.1217 | 8.9000e-003 | 0.1306 | 0.0350 | 8.5100e-003 | 0.0436 | | 400.0273 | 400.0273 | 0.0133 | 0.0577 | 417.5541 |
| Worker | 0.1630 | 0.1229 | 1.5922 | 4.2600e-003 | 0.4918 | 3.1500e-003 | 0.4950 | 0.1304 | 2.9000e-003 | 0.1333 | | 433.4586 | 433.4586 | 0.0125 | 0.0118 | 437.2779 |
| **Total** | **0.2000** | **1.0919** | **1.9224** | **7.9800e-003** | **0.6135** | **0.0121** | **0.6256** | **0.1655** | **0.0114** | **0.1769** | | **833.4859** | **833.4859** | **0.0259** | **0.0695** | **854.8320** |

## 3.4 Building Construction - 2022

**Mitigated Construction On-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Off-Road | 1.6487 | 12.5031 | 12.7264 | 0.0221 | | 0.5889 | 0.5889 | | 0.5689 | 0.5689 | 0.0000 | 2,001.5429 | 2,001.5429 | 0.3486 | | 2,010.2581 |
| **Total** | **1.6487** | **12.5031** | **12.7264** | **0.0221** | | **0.5889** | **0.5889** | | **0.5689** | **0.5689** | **0.0000** | **2,001.5429** | **2,001.5429** | **0.3486** | | **2,010.2581** |

**Mitigated Construction Off-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Hauling | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Vendor | 0.0369 | 0.9691 | 0.3301 | 3.7200e-003 | 0.1217 | 8.9000e-003 | 0.1306 | 0.0350 | 8.5100e-003 | 0.0436 | | 400.0273 | 400.0273 | 0.0133 | 0.0577 | 417.5541 |
| Worker | 0.1630 | 0.1229 | 1.5922 | 4.2600e-003 | 0.4918 | 3.1500e-003 | 0.4950 | 0.1304 | 2.9000e-003 | 0.1333 | | 433.4586 | 433.4586 | 0.0125 | 0.0118 | 437.2779 |
| **Total** | **0.2000** | **1.0919** | **1.9224** | **7.9800e-003** | **0.6135** | **0.0121** | **0.6256** | **0.1655** | **0.0114** | **0.1769** | | **833.4859** | **833.4859** | **0.0259** | **0.0695** | **854.8320** |

## 3.4 Building Construction - 2023

**Unmitigated Construction On-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Off-Road | 1.5233 | 11.7104 | 12.6111 | 0.0221 | | 0.5145 | 0.5145 | | 0.4968 | 0.4968 | | 2,001.787 7 | 2,001.787 7 | 0.3399 | | 2,010.285 8 |
| **Total** | **1.5233** | **11.7104** | **12.6111** | **0.0221** | | **0.5145** | **0.5145** | | **0.4968** | **0.4968** | | **2,001.787 7** | **2,001.787 7** | **0.3399** | | **2,010.285 8** |

**Unmitigated Construction Off-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Hauling | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Vendor | 0.0211 | 0.7636 | 0.2914 | 3.5400e-003 | 0.1217 | 3.6900e-003 | 0.1254 | 0.0350 | 3.5300e-003 | 0.0386 | | 381.1786 | 381.1786 | 0.0127 | 0.0549 | 397.8431 |
| Worker | 0.1514 | 0.1085 | 1.4656 | 4.1200e-003 | 0.4918 | 2.9700e-003 | 0.4948 | 0.1304 | 2.7300e-003 | 0.1332 | | 422.0598 | 422.0598 | 0.0113 | 0.0109 | 425.5733 |
| **Total** | **0.1725** | **0.8721** | **1.7570** | **7.6600e-003** | **0.6135** | **6.6600e-003** | **0.6202** | **0.1655** | **6.2600e-003** | **0.1717** | | **803.2383** | **803.2383** | **0.0240** | **0.0657** | **823.4164** |

## 3.4 Building Construction - 2023

### Mitigated Construction On-Site

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Off-Road | 1.5233 | 11.7104 | 12.6111 | 0.0221 | | 0.5145 | 0.5145 | | 0.4968 | 0.4968 | 0.0000 | 2,001.7877 | 2,001.7877 | 0.3399 | | 2,010.2858 |
| **Total** | **1.5233** | **11.7104** | **12.6111** | **0.0221** | | **0.5145** | **0.5145** | | **0.4968** | **0.4968** | **0.0000** | **2,001.7877** | **2,001.7877** | **0.3399** | | **2,010.2858** |

### Mitigated Construction Off-Site

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Hauling | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Vendor | 0.0211 | 0.7636 | 0.2914 | 3.5400e-003 | 0.1217 | 3.6900e-003 | 0.1254 | 0.0350 | 3.5300e-003 | 0.0386 | | 381.1786 | 381.1786 | 0.0127 | 0.0549 | 397.8431 |
| Worker | 0.1514 | 0.1085 | 1.4656 | 4.1200e-003 | 0.4918 | 2.9700e-003 | 0.4948 | 0.1304 | 2.7300e-003 | 0.1332 | | 422.0598 | 422.0598 | 0.0113 | 0.0109 | 425.5733 |
| **Total** | **0.1725** | **0.8721** | **1.7570** | **7.6600e-003** | **0.6135** | **6.6600e-003** | **0.6202** | **0.1655** | **6.2600e-003** | **0.1717** | | **803.2383** | **803.2383** | **0.0240** | **0.0657** | **823.4164** |

## 3.4 Building Construction - 2024

### Unmitigated Construction On-Site

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Off-Road | 1.4200 | 11.0639 | 12.5172 | 0.0221 | | 0.4506 | 0.4506 | | 0.4348 | 0.4348 | | 2,001.9214 | 2,001.9214 | 0.3334 | | 2,010.2563 |
| **Total** | **1.4200** | **11.0639** | **12.5172** | **0.0221** | | **0.4506** | **0.4506** | | **0.4348** | **0.4348** | | **2,001.9214** | **2,001.9214** | **0.3334** | | **2,010.2563** |

### Unmitigated Construction Off-Site

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Hauling | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Vendor | 0.0204 | 0.7651 | 0.2853 | 3.4900e-003 | 0.1217 | 3.7100e-003 | 0.1254 | 0.0350 | 3.5500e-003 | 0.0386 | | 375.4672 | 375.4672 | 0.0127 | 0.0541 | 391.9039 |
| Worker | 0.1416 | 0.0969 | 1.3654 | 4.0100e-003 | 0.4918 | 2.8500e-003 | 0.4947 | 0.1304 | 2.6200e-003 | 0.1331 | | 413.3975 | 413.3975 | 0.0102 | 0.0101 | 416.6572 |
| **Total** | **0.1620** | **0.8620** | **1.6506** | **7.5000e-003** | **0.6135** | **6.5600e-003** | **0.6201** | **0.1655** | **6.1700e-003** | **0.1716** | | **788.8648** | **788.8648** | **0.0229** | **0.0642** | **808.5611** |

## 3.4 Building Construction - 2024

### Mitigated Construction On-Site

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Off-Road | 1.4200 | 11.0639 | 12.5172 | 0.0221 | | 0.4506 | 0.4506 | | 0.4348 | 0.4348 | 0.0000 | 2,001.9214 | 2,001.9214 | 0.3334 | | 2,010.2563 |
| **Total** | **1.4200** | **11.0639** | **12.5172** | **0.0221** | | **0.4506** | **0.4506** | | **0.4348** | **0.4348** | **0.0000** | **2,001.9214** | **2,001.9214** | **0.3334** | | **2,010.2563** |

### Mitigated Construction Off-Site

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Hauling | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Vendor | 0.0204 | 0.7651 | 0.2853 | 3.4900e-003 | 0.1217 | 3.7100e-003 | 0.1254 | 0.0350 | 3.5500e-003 | 0.0386 | | 375.4672 | 375.4672 | 0.0127 | 0.0541 | 391.9039 |
| Worker | 0.1416 | 0.0969 | 1.3654 | 4.0100e-003 | 0.4918 | 2.8500e-003 | 0.4947 | 0.1304 | 2.6200e-003 | 0.1331 | | 413.3975 | 413.3975 | 0.0102 | 0.0101 | 416.6572 |
| **Total** | **0.1620** | **0.8620** | **1.6506** | **7.5000e-003** | **0.6135** | **6.5600e-003** | **0.6201** | **0.1655** | **6.1700e-003** | **0.1716** | | **788.8648** | **788.8648** | **0.0229** | **0.0642** | **808.5611** |

## 3.5 Paving - 2024

### Unmitigated Construction On-Site

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Off-Road | 0.6180 | 5.8607 | 8.8253 | 0.0136 | | 0.2810 | 0.2810 | | 0.2594 | 0.2594 | | 1,297.8688 | 1,297.8688 | 0.4114 | | 1,308.1547 |
| Paving | 0.0000 | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | | | 0.0000 | | | 0.0000 |
| **Total** | **0.6180** | **5.8607** | **8.8253** | **0.0136** | | **0.2810** | **0.2810** | | **0.2594** | **0.2594** | | **1,297.8688** | **1,297.8688** | **0.4114** | | **1,308.1547** |

### Unmitigated Construction Off-Site

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Hauling | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Vendor | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Worker | 0.0418 | 0.0286 | 0.4034 | 1.1800e-003 | 0.1453 | 8.4000e-004 | 0.1462 | 0.0385 | 7.7000e-004 | 0.0393 | | 122.1402 | 122.1402 | 3.0100e-003 | 2.9800e-003 | 123.1033 |
| **Total** | **0.0418** | **0.0286** | **0.4034** | **1.1800e-003** | **0.1453** | **8.4000e-004** | **0.1462** | **0.0385** | **7.7000e-004** | **0.0393** | | **122.1402** | **122.1402** | **3.0100e-003** | **2.9800e-003** | **123.1033** |

## 3.5 Paving - 2024

**Mitigated Construction On-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Off-Road | 0.6180 | 5.8607 | 8.8253 | 0.0136 | | 0.2810 | 0.2810 | | 0.2594 | 0.2594 | 0.0000 | 1,297.868 8 | 1,297.868 8 | 0.4114 | | 1,308.154 7 |
| Paving | 0.0000 | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | | | 0.0000 | | | 0.0000 |
| **Total** | **0.6180** | **5.8607** | **8.8253** | **0.0136** | | **0.2810** | **0.2810** | | **0.2594** | **0.2594** | **0.0000** | **1,297.868 8** | **1,297.868 8** | **0.4114** | | **1,308.154 7** |

**Mitigated Construction Off-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Hauling | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Vendor | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Worker | 0.0418 | 0.0286 | 0.4034 | 1.1800e-003 | 0.1453 | 8.4000e-004 | 0.1462 | 0.0385 | 7.7000e-004 | 0.0393 | | 122.1402 | 122.1402 | 3.0100e-003 | 2.9800e-003 | 123.1033 |
| **Total** | **0.0418** | **0.0286** | **0.4034** | **1.1800e-003** | **0.1453** | **8.4000e-004** | **0.1462** | **0.0385** | **7.7000e-004** | **0.0393** | | **122.1402** | **122.1402** | **3.0100e-003** | **2.9800e-003** | **123.1033** |

## 3.6 Architectural Coating - 2024

**Unmitigated Construction On-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Archit. Coating | 31.4558 | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | | | 0.0000 | | | 0.0000 |
| Off-Road | 0.1808 | 1.2188 | 1.8101 | 2.9700e-003 | | 0.0609 | 0.0609 | | 0.0609 | 0.0609 | | 281.4481 | 281.4481 | 0.0159 | | 281.8443 |
| **Total** | **31.6366** | **1.2188** | **1.8101** | **2.9700e-003** | | **0.0609** | **0.0609** | | **0.0609** | **0.0609** | | **281.4481** | **281.4481** | **0.0159** | | **281.8443** |

**Unmitigated Construction Off-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Hauling | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Vendor | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Worker | 0.0290 | 0.0198 | 0.2793 | 8.2000e-004 | 0.1006 | 5.8000e-004 | 0.1012 | 0.0267 | 5.4000e-004 | 0.0272 | | 84.5586 | 84.5586 | 2.0800e-003 | 2.0600e-003 | 85.2253 |
| **Total** | **0.0290** | **0.0198** | **0.2793** | **8.2000e-004** | **0.1006** | **5.8000e-004** | **0.1012** | **0.0267** | **5.4000e-004** | **0.0272** | | **84.5586** | **84.5586** | **2.0800e-003** | **2.0600e-003** | **85.2253** |

## 3.6 Architectural Coating - 2024

**Mitigated Construction On-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Archit. Coating | 31.4558 | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | | | 0.0000 | | | 0.0000 |
| Off-Road | 0.1808 | 1.2188 | 1.8101 | 2.9700e-003 | | 0.0609 | 0.0609 | | 0.0609 | 0.0609 | 0.0000 | 281.4481 | 281.4481 | 0.0159 | | 281.8443 |
| **Total** | **31.6366** | **1.2188** | **1.8101** | **2.9700e-003** | | **0.0609** | **0.0609** | | **0.0609** | **0.0609** | **0.0000** | **281.4481** | **281.4481** | **0.0159** | | **281.8443** |

**Mitigated Construction Off-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Hauling | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Vendor | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Worker | 0.0290 | 0.0198 | 0.2793 | 8.2000e-004 | 0.1006 | 5.8000e-004 | 0.1012 | 0.0267 | 5.4000e-004 | 0.0272 | | 84.5586 | 84.5586 | 2.0800e-003 | 2.0600e-003 | 85.2253 |
| **Total** | **0.0290** | **0.0198** | **0.2793** | **8.2000e-004** | **0.1006** | **5.8000e-004** | **0.1012** | **0.0267** | **5.4000e-004** | **0.0272** | | **84.5586** | **84.5586** | **2.0800e-003** | **2.0600e-003** | **85.2253** |

## 4.0 Operational Detail - Mobile

### 4.1 Mitigation Measures Mobile

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Mitigated | 2.2006 | 2.4193 | 22.0597 | 0.0477 | 5.1956 | 0.0355 | 5.2311 | 1.3839 | 0.0330 | 1.4169 | | 4,942.018 8 | 4,942.018 8 | 0.3430 | 0.2139 | 5,014.341 6 |
| Unmitigated | 2.2006 | 2.4193 | 22.0597 | 0.0477 | 5.1956 | 0.0355 | 5.2311 | 1.3839 | 0.0330 | 1.4169 | | 4,942.018 8 | 4,942.018 8 | 0.3430 | 0.2139 | 5,014.341 6 |

### 4.2 Trip Summary Information

| | Average Daily Trip Rate | | | Unmitigated | Mitigated |
|---|---|---|---|---|---|
| Land Use | Weekday | Saturday | Sunday | Annual VMT | Annual VMT |
| General Office Building | 766.04 | 766.04 | 766.04 | 2,467,779 | 2,467,779 |
| Parking Lot | 0.00 | 0.00 | 0.00 | | |
| Strip Mall | 0.00 | 0.00 | 0.00 | | |
| Total | 766.04 | 766.04 | 766.04 | 2,467,779 | 2,467,779 |

### 4.3 Trip Type Information

| | Miles | | | Trip % | | | Trip Purpose % | | |
|---|---|---|---|---|---|---|---|---|---|
| Land Use | H-W or C-W | H-S or C-C | H-O or C-NW | H-W or C-W | H-S or C-C | H-O or C-NW | Primary | Diverted | Pass-by |
| General Office Building | 16.60 | 8.40 | 6.90 | 33.00 | 48.00 | 19.00 | 77 | 19 | 4 |
| Parking Lot | 16.60 | 8.40 | 6.90 | 0.00 | 0.00 | 0.00 | 0 | 0 | 0 |
| Strip Mall | 16.60 | 8.40 | 6.90 | 16.60 | 64.40 | 19.00 | 45 | 40 | 15 |

## 4.4 Fleet Mix

| Land Use | LDA | LDT1 | LDT2 | MDV | LHD1 | LHD2 | MHD | HHD | OBUS | UBUS | MCY | SBUS | MH |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| General Office Building | 0.542464 | 0.063735 | 0.188241 | 0.126899 | 0.023249 | 0.006239 | 0.010717 | 0.008079 | 0.000923 | 0.000604 | 0.024795 | 0.000702 | 0.003352 |
| Parking Lot | 0.542464 | 0.063735 | 0.188241 | 0.126899 | 0.023249 | 0.006239 | 0.010717 | 0.008079 | 0.000923 | 0.000604 | 0.024795 | 0.000702 | 0.003352 |
| Strip Mall | 0.542464 | 0.063735 | 0.188241 | 0.126899 | 0.023249 | 0.006239 | 0.010717 | 0.008079 | 0.000923 | 0.000604 | 0.024795 | 0.000702 | 0.003352 |

## 5.0 Energy Detail

Historical Energy Use: N

### 5.1 Mitigation Measures Energy

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| NaturalGas Mitigated | 0.0169 | 0.1534 | 0.1289 | 9.2000e-004 | | 0.0117 | 0.0117 | | 0.0117 | 0.0117 | | 184.0781 | 184.0781 | 3.5300e-003 | 3.3700e-003 | 185.1720 |
| NaturalGas Unmitigated | 0.0169 | 0.1534 | 0.1289 | 9.2000e-004 | | 0.0117 | 0.0117 | | 0.0117 | 0.0117 | | 184.0781 | 184.0781 | 3.5300e-003 | 3.3700e-003 | 185.1720 |

## 5.2 Energy by Land Use - NaturalGas

**Unmitigated**

| | NaturalGas Use | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Land Use | kBTU/yr | lb/day | | | | | | | | | | lb/day | | | | | |
| General Office Building | 1562.43 | 0.0169 | 0.1532 | 0.1287 | 9.2000e-004 | | 0.0116 | 0.0116 | | 0.0116 | 0.0116 | | 183.8154 | 183.8154 | 3.5200e-003 | 3.3700e-003 | 184.9077 |
| Parking Lot | 0 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Strip Mall | 2.23288 | 2.0000e-005 | 2.2000e-004 | 1.8000e-004 | 0.0000 | | 2.0000e-005 | 2.0000e-005 | | 2.0000e-005 | 2.0000e-005 | | 0.2627 | 0.2627 | 1.0000e-005 | 0.0000 | 0.2643 |
| **Total** | | **0.0169** | **0.1534** | **0.1289** | **9.2000e-004** | | **0.0117** | **0.0117** | | **0.0117** | **0.0117** | | **184.0781** | **184.0781** | **3.5300e-003** | **3.3700e-003** | **185.1720** |

## 5.2 Energy by Land Use - NaturalGas

**Mitigated**

| | NaturalGas Use | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Land Use | kBTU/yr | lb/day | | | | | | | | | | lb/day | | | | | |
| General Office Building | 1.56243 | 0.0169 | 0.1532 | 0.1287 | 9.2000e-004 | | 0.0116 | 0.0116 | | 0.0116 | 0.0116 | | 183.8154 | 183.8154 | 3.5200e-003 | 3.3700e-003 | 184.9077 |
| Parking Lot | 0 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Strip Mall | 0.00223288 | 2.0000e-005 | 2.2000e-004 | 1.8000e-004 | 0.0000 | | 2.0000e-005 | 2.0000e-005 | | 2.0000e-005 | 2.0000e-005 | | 0.2627 | 0.2627 | 1.0000e-005 | 0.0000 | 0.2643 |
| **Total** | | **0.0169** | **0.1534** | **0.1289** | **9.2000e-004** | | **0.0117** | **0.0117** | | **0.0117** | **0.0117** | | **184.0781** | **184.0781** | **3.5300e-003** | **3.3700e-003** | **185.1720** |

# 6.0 Area Detail

## 6.1 Mitigation Measures Area

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Mitigated | 1.2757 | 2.0000e-004 | 0.0216 | 0.0000 | | 8.0000e-005 | 8.0000e-005 | | 8.0000e-005 | 8.0000e-005 | | 0.0464 | 0.0464 | 1.2000e-004 | | 0.0494 |
| Unmitigated | 1.2757 | 2.0000e-004 | 0.0216 | 0.0000 | | 8.0000e-005 | 8.0000e-005 | | 8.0000e-005 | 8.0000e-005 | | 0.0464 | 0.0464 | 1.2000e-004 | | 0.0494 |

## 6.2 Area by SubCategory

**Unmitigated**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SubCategory | lb/day | | | | | | | | | | lb/day | | | | | |
| Architectural Coating | 0.1465 | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | | | 0.0000 | | | 0.0000 |
| Consumer Products | 1.1272 | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | | | 0.0000 | | | 0.0000 |
| Landscaping | 1.9900e-003 | 2.0000e-004 | 0.0216 | 0.0000 | | 8.0000e-005 | 8.0000e-005 | | 8.0000e-005 | 8.0000e-005 | | 0.0464 | 0.0464 | 1.2000e-004 | | 0.0494 |
| **Total** | **1.2757** | **2.0000e-004** | **0.0216** | **0.0000** | | **8.0000e-005** | **8.0000e-005** | | **8.0000e-005** | **8.0000e-005** | | **0.0464** | **0.0464** | **1.2000e-004** | | **0.0494** |

## 6.2 Area by SubCategory

**Mitigated**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SubCategory | lb/day | | | | | | | | | | lb/day | | | | | |
| Architectural Coating | 0.1465 | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | | | 0.0000 | | | 0.0000 |
| Consumer Products | 1.1272 | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | | | 0.0000 | | | 0.0000 |
| Landscaping | 1.9900e-003 | 2.0000e-004 | 0.0216 | 0.0000 | | 8.0000e-005 | 8.0000e-005 | | 8.0000e-005 | 8.0000e-005 | | 0.0464 | 0.0464 | 1.2000e-004 | | 0.0494 |
| **Total** | **1.2757** | **2.0000e-004** | **0.0216** | **0.0000** | | **8.0000e-005** | **8.0000e-005** | | **8.0000e-005** | **8.0000e-005** | | **0.0464** | **0.0464** | **1.2000e-004** | | **0.0494** |

# 7.0 Water Detail

## 7.1 Mitigation Measures Water

## 8.0 Waste Detail

### 8.1 Mitigation Measures Waste

## 9.0 Operational Offroad

| Equipment Type | Number | Hours/Day | Days/Year | Horse Power | Load Factor | Fuel Type |
|---|---|---|---|---|---|---|

## 10.0 Stationary Equipment

**Fire Pumps and Emergency Generators**

| Equipment Type | Number | Hours/Day | Hours/Year | Horse Power | Load Factor | Fuel Type |
|---|---|---|---|---|---|---|

**Boilers**

| Equipment Type | Number | Heat Input/Day | Heat Input/Year | Boiler Rating | Fuel Type |
|---|---|---|---|---|---|

**User Defined Equipment**

| Equipment Type | Number |
|---|---|

## 11.0 Vegetation

**SWAPE** Technical Consultation, Data Analysis and Litigation Support for the Environment

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# Matthew F. Hagemann, P.G., C.Hg., QSD, QSP

**Geologic and Hydrogeologic Characterization**
**Investigation and Remediation Strategies**
**Litigation Support and Testifying Expert**
**Industrial Stormwater Compliance**
**CEQA Review**

## 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 Certifications:

California Professional Geologist
California Certified Hydrogeologist
Qualified SWPPP Developer and Practitioner

## Professional Experience:

Matt has 30 years of experience in environmental policy, contaminant assessment and remediation, stormwater compliance, and CEQA review. He spent nine years with the U.S. EPA in the RCRA and Superfund programs and served as EPA's Senior Science Policy Advisor in the Western Regional Office where he identified emerging threats to groundwater from perchlorate and MTBE. While with EPA, Matt also served as a Senior Hydrogeologist in the oversight of the assessment of seven major military facilities undergoing base closure. He 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, Matt has developed extensive client relationships and has managed complex projects that include consultation as an expert witness and a regulatory specialist, and a manager of projects ranging from industrial stormwater compliance to CEQA review of impacts from hazardous waste, air quality and greenhouse gas emissions.

Positions Matt has held include:

- Founding Partner, Soil/Water/Air Protection Enterprise (SWAPE) (2003 – present);
- Geology Instructor, Golden West College, 2010 – 2104, 2017;
- Senior Environmental Analyst, Komex H2O Science, Inc. (2000 -- 2003);

- Executive Director, Orange Coast Watch (2001 – 2004);
- Senior Science Policy Advisor and Hydrogeologist, U.S. Environmental Protection Agency (1989– 1998);
- Hydrogeologist, National Park Service, Water Resources Division (1998 – 2000);
- Adjunct Faculty Member, San Francisco State University, Department of Geosciences (1993 – 1998);
- Instructor, College of Marin, Department of Science (1990 – 1995);
- Geologist, U.S. Forest Service (1986 – 1998); and
- Geologist, Dames & Moore (1984 – 1986).

**<u>Senior Regulatory and Litigation Support Analyst:</u>**

With SWAPE, Matt's responsibilities have included:

- Lead analyst and testifying expert 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. Make recommendations for 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 worker exposure to hazards from toxins and Valley Fever.
- Stormwater analysis, sampling and best management practice evaluation at more than 100 industrial facilities.
- Expert witness on numerous cases including, for example, perfluorooctanoic acid (PFOA) contamination of groundwater, MTBE litigation, air toxins at hazards at a school, CERCLA compliance in assessment and remediation, and industrial stormwater contamination.
- Technical assistance and litigation support for vapor intrusion concerns.
- 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., Matt's 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.

- Expert witness testimony in a case of oil production-related contamination in Mississippi.
- Lead author for a multi-volume remedial investigation report for an operating school in Los Angeles that met strict regulatory requirements and rigorous deadlines.
- Development of strategic approaches for cleanup of contaminated sites in consultation with clients and regulators.

**Executive Director:**

As Executive Director with Orange Coast Watch, Matt led efforts to restore water quality at Orange County beaches from multiple sources of contamination including urban runoff and the discharge of wastewater. In reporting to a Board of Directors that included representatives from leading Orange County universities and businesses, Matt prepared issue papers in the areas of treatment and disinfection of wastewater and control of the discharge of grease to sewer systems. Matt actively participated in the development of countywide water quality permits for the control of urban runoff and permits for the discharge of wastewater. Matt worked with other nonprofits to protect and restore water quality, including Surfrider, Natural Resources Defense Council and Orange County CoastKeeper as well as with business institutions including the Orange County Business Council.

**Hydrogeology:**

As a Senior Hydrogeologist with the U.S. Environmental Protection Agency, Matt 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 were as follows:

- Led efforts to model groundwater flow and contaminant transport, ensured adequacy of monitoring networks, and assessed cleanup alternatives for contaminated sediment, soil, and groundwater.
- Initiated a regional program for evaluation of groundwater sampling practices and laboratory analysis at military bases.
- Identified 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, Matt developed a methodology to determine the vulnerability of groundwater to contamination on the islands of Maui and Oahu. He 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, Matt 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 his 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. He prepared geologic reports, conducted

public 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.

Matt served as a hydrogeologist with the RCRA Hazardous Waste program. Duties were as follows:

- 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, Matt directed service-wide investigations of contaminant sources to prevent degradation of water quality, including the following tasks:

- 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 senior management as the Senior Science Policy Advisor with the U.S. Environmental Protection Agency, Region 9.

Activities included the following:

- Advised 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.
- Shaped 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.
- Improved the technical training of EPA's scientific and engineering staff.
- Earned 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.

- Established national protocol for the peer review of scientific documents.

**<u>Geology:</u>**

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

- Mapped geology in the field, and used aerial photographic interpretation and mathematical models to determine slope stability.
- Coordinated his research with community members who were concerned with natural resource protection.
- Characterized 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, Matt led geologic investigations of two contaminated sites (later listed on the Superfund NPL) in the Portland, Oregon, area and a large hazardous waste site in eastern Oregon. Duties included the following:

- Supervised year-long effort for soil and groundwater sampling.
- Conducted aquifer tests.
- Investigated active faults beneath sites proposed for hazardous waste disposal.

**<u>Teaching:</u>**

From 1990 to 1998, Matt 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.

Matt is currently a part time geology instructor at Golden West College in Huntington Beach, California where he taught from 2010 to 2014 and in 2017.

**<u>Invited Testimony, Reports, Papers and Presentations:</u>**

**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, Coloradao.

**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 repesentatives, 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 Quality 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**., Fukanaga, 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.

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# *Paul Rosenfeld, Ph.D.*

**Chemical Fate and Transport & Air Dispersion Modeling**

*Principal Environmental Chemist*

**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 $H_2O$ 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., Hallman R., Bressler R., Smith, G., (2022) Cancer Risk and Diesel Exhaust Exposure Among Railroad Workers. *Water Air Soil Pollution.* **233,** 171.

Remy, L.L., Clay T., Byers, V., **Rosenfeld P. E.** (2019) Hospital, Health, and Community Burden After Oil Refinery Fires, Richmond, California 2007 and 2012. *Environmental Health.* 18:48

Simons, R.A., Seo, Y. **Rosenfeld, P**., (2015) Modeling the Effect of Refinery Emission On Residential Property Value. Journal of Real Estate Research. 27(3):321-342

Chen, J. A, Zapata A. R., Sutherland A. J., Molmen, D.R., Chow, B. S., Wu, L. E., **Rosenfeld, P. E.,** Hesse, R. C., (2012) Sulfur Dioxide and Volatile Organic Compound Exposure To A Community In Texas City Texas Evaluated Using Aermod and Empirical Data. *American Journal of Environmental Science*, 8(6), 622-632.

**Rosenfeld, P.E**. & Feng, L. (2011). *The Risks of Hazardous Waste.* Amsterdam: Elsevier Publishing.

Cheremisinoff, N.P., & **Rosenfeld, P.E.** (2011). *Handbook of Pollution Prevention and Cleaner Production: Best Practices in the Agrochemical Industry*, Amsterdam: Elsevier Publishing.

Gonzalez, J., Feng, L., Sutherland, A., Waller, C., Sok, H., Hesse, R., **Rosenfeld, P.** (2010). PCBs and Dioxins/Furans in Attic Dust Collected Near Former PCB Production and Secondary Copper Facilities in Sauget, IL. *Procedia Environmental Sciences*. 113–125.

Feng, L., Wu, C., Tam, L., Sutherland, A.J., Clark, J.J., **Rosenfeld, P.E.** (2010). Dioxin and Furan Blood Lipid and Attic Dust Concentrations in Populations Living Near Four Wood Treatment Facilities in the United States. *Journal of Environmental Health*. 73(6), 34-46.

Cheremisinoff, N.P., & **Rosenfeld, P.E.** (2010). *Handbook of Pollution Prevention and Cleaner Production: Best Practices in the Wood and Paper Industries.* Amsterdam: Elsevier Publishing.

Cheremisinoff, N.P., & **Rosenfeld, P.E.** (2009). *Handbook of Pollution Prevention and Cleaner Production: Best Practices in the Petroleum Industry*. Amsterdam: Elsevier Publishing.

Wu, C., Tam, L., Clark, J., **Rosenfeld, P**. (2009). Dioxin and furan blood lipid concentrations in populations living near four wood treatment facilities in the United States. *WIT Transactions on Ecology and the Environment, Air Pollution,* 123 (17), 319-327.

Tam L. K.., Wu C. D., Clark J. J. and **Rosenfeld, P.E.** (2008). A Statistical Analysis Of Attic Dust And Blood Lipid Concentrations Of Tetrachloro-p-Dibenzodioxin (TCDD) Toxicity Equivalency Quotients (TEQ) In Two Populations Near Wood Treatment Facilities. *Organohalogen Compounds*, 70, 002252-002255.

Tam L. K.., Wu C. D., Clark J. J. and **Rosenfeld, P.E.** (2008). Methods For Collect Samples For Assessing Dioxins And Other Environmental Contaminants In Attic Dust: A Review. *Organohalogen Compounds*, 70, 000527-000530.

Hensley, A.R. A. Scott, J. J. J. Clark, **Rosenfeld, P.E.** (2007). Attic Dust and Human Blood Samples Collected near a Former Wood Treatment Facility. *Environmental Research*. 105, 194-197.

**Rosenfeld, P.E.,** J. J. J. Clark, A. R. Hensley, M. Suffet. (2007). The Use of an Odor Wheel Classification for Evaluation of Human Health Risk Criteria for Compost Facilities. *Water Science & Technology* 55(5), 345-357.

**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.

Sullivan, P. J. Clark, J.J.J., Agardy, F. J., **Rosenfeld, P.E.** (2007). *Toxic Legacy, Synthetic Toxins in the Food, Water, and Air in American Cities.* Boston Massachusetts: Elsevier Publishing

**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.

**Rosenfeld P. E.,** J.J. Clark, I.H. (Mel) Suffet (2004). The Value of An Odor-Quality-Wheel Classification Scheme For The Urban Environment. *Water Environment Federation's Technical Exhibition and Conference (WEFTEC) 2004.* New Orleans, October 2-6, 2004.

**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.

**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.

**Rosenfeld, P. E**., Grey, M. A., Sellew, P. (2004). Measurement of Biosolids Odor and Odorant Emissions from Windrows, Static Pile and Biofilter. *Water Environment Research*. 76(4), 310-315.

**Rosenfeld, P.E.,** Grey, M and Suffet, M. (2002). Compost Demonstration Project, Sacramento California Using High-Carbon Wood Ash to Control Odor at a Green Materials Composting Facility. *Integrated Waste Management Board Public Affairs Office*, Publications Clearinghouse (MS–6), Sacramento, CA Publication #442-02-008.

**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.

**Rosenfeld, P.E.,** and Henry C. L., (2000). Wood ash control of odor emissions from biosolids application. *Journal of Environmental Quality.* 29, 1662-1668.

**Rosenfeld, P.E.,** C.L. Henry and D. Bennett. (2001). Wastewater dewatering polymer affect on biosolids odor emissions and microbial activity. *Water Environment Research*. 73(4), 363-367.

**Rosenfeld, P.E.,** and C.L. Henry. (2001). Activated Carbon and Wood Ash Sorption of Wastewater, Compost, and Biosolids Odorants. *Water Environment Research*, 73, 388-393.

**Rosenfeld, P.E.,** and Henry C. L., (2001). High carbon wood ash effect on biosolids microbial activity and odor. *Water Environment Research*. 131(1-4), 247-262.

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. Masters 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. Bachelors 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). Perfluoroctanoic Acid (PFOA) and Perfluoroactane 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 from 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 Conferenc*e. 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. 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 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 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 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 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

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.cvs. 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 Cunty of Maricopa
Mary Tryon et al. vs. The City of Pheonix 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 Agrosciences, 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., Plaintifs 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. v. 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 County Court of Dallas County Texas
Lisa Parr et al, Plaintiff, vs. Aruba et al, Defendant.
Case No. cc-11-01650-E
Rosenfeld Deposition: March and September 2013
Rosenfeld Trial April 2014

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 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

In the Circuit Court of Jefferson County Alabama
Jaeanette Moss Anthony, et al., Plaintiffs, vs. Drummond Company Inc., et al., Defendants
Civil Action No. CV 2008-2076
Rosenfeld Deposition September 2010

In the United States District Court, Western District Lafayette Division
Ackle et al., Plaintiffs, vs. Citgo Petroleum Corporation, et al., Defendants.
Case No. 2:07CV1052
Rosenfeld Deposition July 2009