LOZEAU DRURY LLP
T 510.836.4200
F 510.836.4205
1939 Harrison Street, Ste. 150
Oakland, CA 94612
www.lozeaudrury.com
Adam@lozeaudrury.com

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Via E-mail

Mayor Acquanetta Warren
Mayor Pro Tem Peter Garcia
Councilmember John Roberts
Councilmember Jesus "Jesse" Sandoval
Councilmember Philip Cothran
City of Fontana
8353 Sierra Ave
Fontana, CA 92335
publiccomments@fontana.org

Cecily Session-Goins, Associate Planner
Planning Department
City of Fontana
8353 Sierra Ave
Fontana, CA 92335
csgoins@fontana.org

Germaine McClellan Key, City Clerk
City of Fontana
8353 Sierra Avenue
Fontana, CA 92335
gkey@fontana.org

Re: Supplemental Comment on the Summit Avenue Warehouse Project (Master Case No. 21-040; General Plan Amendment No. 21-001; Zoning Change No. 21-002; Design Review No. 21-014; and Development Agreement No. 22-001) (City Council Agenda, Public Hearing Item A – Part No. 1)

Dear Mayor Warren, Mayor Pro Tem Garcia, Honorable City Council Members, Ms. Session-Goins, and Ms. McClellan Key:

I am writing on behalf of Supporters Alliance for Environmental Responsibility ("SAFER") regarding the Initial Study and Mitigated Negative Declaration ("IS/MND") prepared for the Summit Avenue Warehouse Project ("Project") (Master Case No. 21-040; General Plan Amendment No. 21-001; Zoning Change No. 21-002; Design Review No. 21-014; and Development Agreement No. 22-001), for Applicant Ray Allard of Allard Engineering ("Applicant"), including all actions related or referring to the proposed construction and operation of an approximately 102,380 square foot industrial commerce building, located on the northeast corner of Sierra Avenue and Summit Avenue, in the City of Fontana, California (APN: 0239-161-28).

SAFER is concerned by the inadequacy of the IS/MND prepared for the Project. On July 5, 2022, the City of Fontana Planning Commission ("Planning Commission") made findings and a recommendation that the Fontana City Council approve the Project and the Project IS/MND. This letter supplements SAFER's prior comments submitted to the Planning Commission on July 5, 2022.

SAFER's review of the Project has been assisted by wildlife biologist Dr. Shawn Smallwood, Ph.D.; and air quality experts Matt Hagemann, P.G., C.Hg. and Paul E. Rosenfeld, Ph.D., of the environmental consulting firm, Soil/Water/Air Protection Enterprise ("SWAPE"). The expert comments of Dr. Smallwood and SWAPE are attached as Exhibit A and Exhibit B, respectively.

After reviewing the IS/MND, it is evident that the IS/MND is inadequate and fails as an informational document because there is a "fair argument" that the Project may have unmitigated adverse environmental impacts. Therefore, CEQA requires that the City of Fontana ("City") prepare an environmental impact report ("EIR") for the Project, pursuant to the California Environmental Quality Act ("CEQA"), Public Resources Code section 21000, et seq. SAFER respectfully requests that you deny approval of the IS/MND and direct the Fontana Planning Department to prepare an EIR as required under CEQA.

I. PROJECT DESCRIPTION

The applicant proposes to construct a 102,380-square-foot warehouse facility, which would include 10,000 square feet of office space (5,000 square feet on the first floor and 5,000 square feet mezzanine and 92,380 square feet of warehouse space). The warehouse would have 11 truck loading docks, three trailer stalls, and 53 automobile parking stalls.

The Project site is located upon approximately 4.49 acres of undeveloped land. It is surrounded by warehouses on the adjoining parcels to its immediate north, east, and south. Single family residences are located to the west and southwest.

The Project would require a General Plan land use and zoning amendment to change the site's land use designation from General Commercial (C-G) to Light Industrial (I-L), and to change the site's zoning designation from General Commercial (C-2) to Light Industrial (M-1).

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, 319-320 (*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, 504–505).) "Significant environmental effect" is defined very broadly as "a substantial or potentially substantial adverse change in the environment." (Pub. Res. Code ("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 IS/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 California Environmental Quality Act*, §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).)

For over forty years the courts have consistently held that an accurate and stable project description is a bedrock requirement of CEQA—the *sine qua non* (that without which there is nothing) of an adequate CEQA document:

> Only through an accurate view of the project may affected outsiders and public decision-makers balance the proposal's benefit against its environmental cost, consider mitigation measures, assess the advantage of terminating the proposal (i.e., the "no project" alternative) and weigh other alternatives in the balance. An accurate, stable and finite project description is the *sine qua non* of an informative and legally sufficient EIR.

(*County of Inyo v. City of Los Angeles* (1977) 71 Cal.App.3d 185 at 192–93.) CEQA therefore requires that an environmental review document provide an adequate description of the project to allow for the public and government agencies to participate in the review process through submitting public comments and making informed decisions.

Lastly, 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. ANALYSIS

A. The IS/MND Does Not Properly Analyze Scientific Database Records and Fails to Accurately Characterize the Project's Current Environmental Setting.

Expert wildlife biologist Dr. Shawn Smallwood, Ph.D., reviewed the IS/MND and the associated biological assessment prepared by UltraSystems (attached at Appendix C to the IS/MND) to inform his comments. Dr. Smallwood also relied upon a detailed report and photographs taken by his associate Noriko Smallwood, a wildlife biologist, following a visit she made to the proposed Project site on June 28, 2022. (*See*, Ex. A., pp. 1-6.) Based on this information, Dr. Smallwood concluded that the Project's impacts to wildlife may include significant impacts on several special-status species and that an EIR is required to fully analyze these impacts. Dr. Smallwood's comment and CV are attached as Exhibit A.

During her site visit, Ms. Smallwood "detected 16 species of vertebrate wildlife at the site…, as well as 2 species of invertebrate wildlife of significance," during the 2 hours and 13 minutes she spent surveying the Project site. (Ex A., p. 2.) Three of the species that she detected during her site were special-status species. (*Id*., p. 3, Table 1.) Ms. Smallwood observed abundant wildlife, including at least 56 animals on the site. She observed "harvester ants (*Pogonomermyx californicus*), which are significant ecological keystone species for their roles in soil bioturbation and as prey to Blainville's horned lizards and other species", as well as "Monarch butterfly (Photo 3), northern mockingbirds and mourning doves (Photos 4 and 5), California horned larks (Photo 6), Anna's hummingbird and western side-blotched lizard (Photos 7 and 8), and numerous burrows of Botta's pocket gopher and an unidentified species of kangaroo rat (Photos 9 and 10)." (*Id*., pp. 2-6.)

Dr. Smallwood identified 103 special-status species of wildlife as potentially occurring at the site following his review of Ms. Smallwood's site visit report, as well as scientific databases *eBird* and *iNaturalist*. (*Id*., p. 12; *Id*., pp. 13-16, Table 2.) Dr. Smallwood explains, in detail, that the limitations of the CNDDB database—the sole database consulted by Ultrasystems in preparing its biological assessment—are "well-known, and summarized by CDFW [the California Department of Fish and Wildlife] in a warning presented on its CNDDB web site." (*Id*., p. 17.) Therefore, he concludes, "***A fair argument can be made for the need to prepare an EIR to more appropriately analyze data base records to characterize the current environmental setting**.*" (*Id*. [emph. added].)

Dr. Smallwood stated that "3 (3%) [of the species he identified] were confirmed on site by survey visits, 43 (43%) have been documented within 1.5 miles of the site ('Very close'), 8 (8%) within 1.5 and 3 miles ('Nearby'), and another 38 (38%) within 3 to 30 miles ('In region')." (*Id*., p. 12.) Despite these findings, however, the Ultrasystems report "addresses only 22" of the 103 special-status species that Dr. Smallwood identified. (*Id*.) Therefore, Dr. Smallwood notes: "***The [Project] site holds much more potential for supporting special-status species of wildlife than determined in the IS/MND***." (*Id*. [emph. added].)

B. The Project Threatens Numerous Special-Status Species and the IS/MND Neglects to Properly Account for Likely Impacts to Wildlife.

Dr. Smallwood points to several examples in which the IS/MND and the biological assessment fail to adequately analyze or mitigate significant adverse impacts to special-status species resulting from proposed Project construction and operations.

First, Dr. Smallwood found that the IS/MND only attaches significance to potential impacts to habitat where bird nest sites likely already occur, which is improper because "all parts of a species' habitat is of critical importance to breeding success and productivity." (Ex. A, p. 17.) For instance, "[i]t is not entirely relevant" to the occurrence of Cooper's hawk, a special-status bird species, that "trees do not grow on site." (*Id.*) Additionally, "any Cooper's hawks attempting to breed in the area likely forage on the project site." (*Id.*) As such, ***"[l]oss of the food base from this site would likely be devastating to the nearest breeding pair of Cooper's hawk***" (*Id.* [emph. added].)

Next, Dr. Smallwood notes that "***the IS/MND's analysis of potential impacts to Los Angeles pocket mouse (LAPM) is recklessly flawed***." (*Id.* [emph. added].) Specifically, Dr. Smallwood states that the biological assessment inaccurately purports that the Project's impact to LAPM habitat and statewide population does "not meet the threshold of significance set forth in Section 15065 of the [CEQA] Guidelines." (*Id.*, pp. 18.) Dr. Smallwood makes clear, however, that this conclusion is inconsistent with the IS/MND's finding in the immediately preceding paragraph, which states: "The conversion of habitat to agricultural, suburban, and urban uses in the San Jacinto and Temecula valleys has greatly reduced and fragmented the historic habitat and its populations in this region. While there are a number of extant populations, many of these are small and are likely to disappear in the coming years (Brylski, 1988-1990a)." (*Id.*, p. 18.) Hence, "***[i]f [LAPM] occurs on the project site, which UltraSystems (2022) thinks they might, then the project would cause a highly significant impact to [LAPM]***. (*Id.* [emph. added].)

In addition to the potential threats facing LAPM, Dr. Smallwood found that "[t]he same applies to northwestern San Diego pocket mouse, which the IS/MND acknowledges to have been documented immediately adjacent to the project site, but which it again claims the loss of a population on the site would be less than significant." (*Id.*) However, Dr. Smallwood concludes that, "[g]iven the Precautionary Principle in risk analysis, and given the foremost principles of CEQA, ***the burden of evidence is on [the] City […] to prove less than significant impacts to species known or likely to occur on a project site***." (*Id.*)

Next, Dr. Smallwood found that "the IS/MND's analysis of potential impacts to San Bernardino kangaroo rat is also flawed." (*Id.* [emph. added].) According to Dr. Smallwood, the Project site occurs within federally designated critical habitat of San Bernardino kangaroo rat, which is also documented to have occurred only 300 meters (0.19 miles) from the Project site. (*Id.*) Despite conceding that burrows detected on the Project site may have belonged to this species, the IS/MND abruptly concludes that because "there is no active fluvial system within the BSA," or biological study area, "the habitat is only marginally suitable." (*Id.*)

But, Dr. Smallwood notes, "neither was there an active fluvial system where the species was documented 300 [meters] to the northwest." (*Id.*) As such, "[t]he IS/MND attempts to pigeon-hole San Bernardino kangaroo rat into a narrow portion of the environment so that it can say that that type of environment is absent from the project site." (*Id.*) However, the "San Bernardino kangaroo rat has a broader habitat than the IS/MND characterizes," and moreover, Ms. Smallwood photographed burrows which Dr. Smallwood concluded based on his expert experience working with this species appear "very likely" to be "those of kangaroo rats (Photos 15 and 16)." (*Id.*)

Dr. Smallwood also found that the IS/MND incorrectly “considers the occurrence likelihood of San Diego black-tailed jackrabbit to be low because ‘[t]his species is highly mobile and could potentially use the site as a passage to more wooded areas. …’” (*Id.*) As Dr. Smallwood observes, however, “San Diego black-tailed jackrabbits do not live in wooded areas.” (*Id.*) Therefore, Dr. Smallwood concludes that because “[t]he species has been documented only 1.75 miles away” from the Project site, “and as the IS/MND correctly describes, this species is mobile,” “one should expect San Diego black-tailed jackrabbit to find its last remaining refuge on the project site,” because it has no remaining habitat in the area. (*Id.*)

In addition, Dr. Smallwood evaluates several wildlife impacts which he considers “likely to result from the project” but which are not considered by the IS/MND or the biological assessment. (*Id.*, p. 20). First, he notes that the IS/MND “does not address potential impacts of habitat loss to breeding birds.” (*Id.*) Based on his expert evaluation of Ms. Smallwood’s site visit report, he estimates that the Project would result in the “loss of 31 nest sites of birds,” and a corresponding “denial to California of 102 birds per year,” both of which he deems “a significant project impact that has not been addressed.” (*Id.*, p. 21.) Dr. Smallwood thus concludes that a “***fair argument can be made for the need to prepare an EIR to appropriately analyze the project’s impacts to wildlife caused by habitat loss and habitat fragmentation***.” (*Id*. [emph. added].)

Next, Dr. Smallwood writes that the IS/MND’s analysis of “***whether the project would interfere with wildlife movement in the region is fundamentally flawed***.” (*Id*. [emph. added].) Dr. Smallwood explains that the IS/MND’s conclusion that the Project would not impact wildlife movement is rooted in its misplaced observation that the Project site is not located directly within a designated wildlife corridor. (*Id*.) Despite its location, the Project site is nonetheless “critically important for wildlife movement because it composes an increasingly diminishing area of open space within a growing expanse of anthropogenic uses” throughout the region. (*Id*.) An EIR is necessary to fully evaluate these impacts upon wildlife movement.

Dr. Smallwood also identified likely traffic impacts that would affect wildlife living on or near the Project site which the IS/MND failed to address. Based on his expert analysis, Dr. Smallwood estimates that the Project would result in “548 vertebrate wildlife fatalities per year,” or a total of 27,400 wildlife fatalities over 50 years. (*Id*., p. 24.) He thus concludes that “***the project-generated traffic would cause substantial, significant impacts to wildlife***,” and therefore, “a fair argument that can be made for the need to prepare an EIR to analyze this impact.” (*Id*. [emph. added].)

Lastly, Dr. Smallwood notes that because the biological assessment identified ground squirrels on the Project site, “protocol-level detection surveys are warranted for burrowing owl (CDFW 2012).” (*Id*., p. 19.) According to Dr. Smallwood, such “surveys are needed to be consistent with CDFW’s guidelines and to inform [preparation of] an EIR.” (*Id.*)

The IS/MND and related biological assessment thus fail to adequately analyze the Project’s impacts upon special-status species. Dr. Smallwood concludes that the Project will impact numerous special-status species, and an EIR is necessary to fully evaluate the potential impacts the Project will have on special-status species located on or near the Project site.

C. The IS/MND's Proposed Mitigation Measures Fail to Adequately Address the Project's Likely Impacts to Threatened Wildlife, Including Projected Habitat Loss and Barriers to Wildlife Movement.

Dr. Smallwood found that the IS/MND's proposed mitigation measures "would provide little conservation benefit to wildlife" threatened by the Project. (*Id*., p. 25.) Instead, he notes, "***[m]ost are empty gestures, because they would provide benefits only if patches of habitat would be left in place, which is not the case with this project***." (*Id*. [emph. added].) Rather, "the plan is for no habitat to remain anywhere on the project site," because following completion, the undeveloped land would be entirely "converted into the proposed warehouse, impervious surfaces and ornamental landscaping." (*Id.*, p. 26.)

Therefore, Dr. Smallwood recommends several new mitigation measures, such as detection surveys for wildlife species, preconstruction nest surveys, compensatory measures for impacts to habitat loss, wildlife movement, road mortality, and funding for wildlife rehabilitation facilities. (*Id.*, pp. 26-27.) An EIR is required to full analyze implementation of these feasible mitigation measures.

D. The IS/MND Relies Upon Flawed Air Quality Data and Fails to Explain How the Project Will Comply with Applicable Air Quality Standards.

The IS/MND asserts that the Project's air quality impacts are less than significant and that no mitigation measures are required. (*See*, IS/MND, pp. 4.3-1–4.3-10 [air quality impact analysis]; 4.8-1–4.8-5 [GHG emissions analysis].) But this statement is unfounded.

Air quality experts with the environmental consulting firm SWAPE reviewed the IS/MND's analysis of air quality and greenhouse gas emissions impacts, including the "Air Quality and Greenhouse Gas Emissions Study" ("AQ & GHG Study"), attached as Appendix B to the IS/MND. (Ex. B., p. 3). Upon reviewing the IS/MND's air quality discussion, which relied upon data values input to the "California Emissions Estimator Model ("CalEEMod") Version 2020.4.0" to calculate the Project's likely air quality impacts, SWAPE found that "several model inputs were not consistent with information disclosed in the IS/MND." (*Id*.) SWAPE therefore concluded that "the Project's construction and operational emissions may be underestimated." (*Id*.) In light of the IS/MND's improper analysis of the Project's air quality impacts, a fair argument exists that the City must prepare an EIR to adequately evaluate "the impacts that construction and operation of the Project will have on local and regional air quality." (*Id*.)

In light of this flawed analysis, SWAPE conducted its own assessment of the Project's estimated construction-related and operational emissions, using "Project-specific information provided by the IS/MND." (*Id*., p. 9.) In its updated model, SWAPE properly accounted for various modeling errors and omissions presented in the IS/MND analysis, including, "all of the proposed land uses; omitted the unsubstantiated changes to the architectural coating emission factors and off-road construction equipment unit amounts and usage hours; and included the correct number of operational daily vehicle trips." (*Id.*) Here, SWAPE found that, contrary to the IS/MND's assertions, the "Project's construction-related ROG [reactive organic gas] emissions […] increase by approximately 101%, and exceed the applicable SCAQMD significance threshold." (*Id.*)

In addition to SWAPE's expert analysis which revealed numerous analytical errors, it is important to note that the IS/MND's assertion that it complies with applicable air quality standards is similarly unfounded. For instance, these assurances are made without any reference to SCAQMD's ongoing revisions to its CEQA compliance guidance for analysis of cumulative air pollution impacts. (*See* California Department of Justice, *Attorney General Bonta Announces Innovative Settlement with City of Fontana to Address Environmental Injustices in Warehouse Development*, April 18, 2022, https://oag.ca.gov/news/press-releases/attorney-general-bonta-announces-innovative-settlement-city-fontana-address; and, South Coast Air Quality Management District, *CEQA Policy Development (NEW)*, http://www.aqmd.gov/home/rules-compliance/ceqa/ceqa-policy-development-(new).) The proposed guidance will substantially revise the agency's cumulative impacts analysis standards and replace its "Air Quality Analysis Guidance Handbook," which was adopted in 1993.

The IS/MND also fails to address – in any capacity – how the Project will comply with SCAQMD Rule No. 2305 (adopted May 7, 2021), also known as the "Warehouse Indirect Source Rule." (SCAQMD, *Rule No. 2305, Warehouse Indirect Source Rule – Warehouse Actions and Investments to Reduce Emissions (WAIRE) Program*, https://www.aqmd.gov/docs/default-source/rule-book/reg-xxiii/r2305.pdf?sfvrsn=15). The rule contains important provisions relating to localized warehouse emissions which must be fully evaluated. Based on these methodological errors, and the IS/MND's failure to properly disclose how the Project will comply with applicable air quality regulations, a fair argument exists that the Project will have a significant environmental impact. An EIR must be prepared to properly account for the Project's likely impact to local and regional air quality.

E. The IS/MND Fails to Evaluate the Project's Likely Contribution to Cumulative Air Quality Impacts.

"'Cumulative impacts' refer to two or more individual effects which, when considered together, are considerable or which compound or increase other environmental impacts." (14 CCR § 15355.) "The cumulative impact from several projects is the change in the environment which results from the incremental impact of the project when added to other closely related past, present, and reasonably foreseeable probable future projects." (14 CCR § 15355(b).) "Cumulative impacts can result from individually minor but collectively significant projects taking place over a period of time." (*Id.*; *see e.g.*, *Communities for a Better Environment v. Cal. Resources Agency* (2002) 103 Cal.App.4th 98, 117.)

Air quality experts with the environmental consulting firm SWAPE reviewed the IS/MND and found that it failed to accurately account for the "cumulative air quality impact from the several warehouse projects proposed or built in a one-mile radius of the Project site." (Ex. B., p. 15). SWAPE therefore recommends that the City prepare an EIR, including a cumulative health risk assessment ("HRA"), "to quantify the adverse health outcome from the effects of exposure to multiple warehouses in the immediate area in conjunction with the poor ambient air quality in the Project's census tract." (*Id.*) It is therefore evident that an EIR is required to adequately consider the extent of these cumulative air quality impacts and to propose a broader suite of mitigation measures to protect the health of impacted residents.

F. The IS/MND Fails to Properly Account for Health Risks Resulting from the Project's Diesel Particulate Emissions and Does Not Account for Impacts Upon Sensitive Receptors in the Impacted Area.

The IS/MND asserts that the Project would result in a less than significant health risk impact from its projected diesel particulate matter emissions. This assessment was based on a "quantified construction and operational screening health risk assessment ("HRA") using the U.S. EPA's SCREEN3 model." (Ex. B., p. 15.) (*See also*, IS/MND, p. 4.3-10, and IS/MND, Appendix H). But air quality experts with the environmental consulting firm SWAPE evaluated these assertions and concluded that they are incorrect for several reasons. (*Id*., p. 16.)

First, the HRA relied upon an "outdated screening model" which is no longer recommended by the U.S. EPA for conducting health assessments. (*Id*.) Next, SWAPE noted, "the IS/MND's construction HRA is incorrect, as it relies upon a PM10 estimate from a flawed air model." (*Id*.) Lastly, contrary to applicable guidance issued by the California Office of Environmental Heath Hazard Assessment ("OEHHA"), the HRA "fails to evaluate the combined lifetime cancer risk to nearby receptors as a result of Project construction and operation together." (*Id*., p. 17.)

SWAPE further explained that "San Bernardino County, the setting of the proposed Project, has long borne a disproportionately high pollution burden compared to the rest of California." (*Id.*, p. 10). Additionally, "[w]hen using CalEnviroScreen 4.0, CalEPA's screening tool that ranks each census tract in the State for pollution and socioeconomic vulnerability," SWAPE noted that "the Project's census tract is in the 80th percentile of most polluted census tracts in the State." (*Id*., p. 11.) "Therefore," SWAPE observed, "development of the proposed warehouse would disproportionately contribute to and exacerbate the health conditions of the [impacted] residents in Fontana." (*Id*., p. 12.) Finally, based on the Project site's proximity to two local elementary schools, SWAPE concluded that the Project's diesel particulate emissions pose "a significant threat because, as outlined above, children are a vulnerable population that are more susceptible to the damaging side effects of air pollution." (*Id*., p. 15.)

G. The IS/MND Fails to Provide Evidence to Support its Energy Analysis and Does Not Adequately Evaluate Available Renewable Energy Alternatives.

CEQA provides that all Projects must include “measures to reduce the wasteful, inefficient, and unnecessary consumption of energy.” (PRC § 21100(b)(3).) Energy conservation under CEQA is defined as the “wise and efficient use of energy.” (CEQA Guidelines, app. F, § I.) The “wise and efficient use of energy” is achieved by “(1) decreasing overall per capita energy consumption, (2) decreasing reliance on fossil fuels such as coal, natural gas and oil, and (3) increasing reliance on renewable energy resources.” (*Id.*) The IS/MND’s analysis of the Project’s energy impacts is conclusory and fails to provide the necessary analysis. (*See*, IS/MND, pp. 4.6-1–4.6-4.)

Notably, a failure to undertake “an investigation into renewable energy options that might be available or appropriate for a project” also violates CEQA. (*California Clean Energy Committee v. City of Woodland* (2014) 225 Cal.App.4th 173, 213.) Additionally, compliance with the California Building Energy Efficiency Standards (Cal. Code Regs., tit. 24, part 6 (“Title 24”)) does not, in and of itself, constitute an adequate energy analysis under CEQA. (*Ukiah Citizens for Safety First v. City of Ukia*h (2016) 248 Cal.App.4th 256, 264-65.) For instance, in *Clean Energy*, the court held unlawful an energy analysis which relied solely on a project’s compliance with Title 24, but which failed to assess the project’s transportation energy impacts and lacked any discussion regarding possible uses of renewable energy. (225 Cal.App.4th at pp. 209, 213.) Thus, the IS/MND’s reliance on Title 24 compliance does not satisfy CEQA’s requirement to conduct an assessment of the Project’s energy impacts.

Furthermore, the IS/MND fails to discuss, in any detail, the Project’s potential energy savings in terms of utilizing available renewable alternatives, as required under *Clean Energy*. Instead, it refers to “energy usage in comparison to similar development projects of this nature” to justify its use of diesel-fueled construction equipment, without evaluating the potential use of electric equipment or other non-fossil fuel alternatives. (*See*, IS/MND, p. 4.6-1). Similarly, the IS/MND states elsewhere that the facility’s use of natural gas would have a “less than significant impact” merely because it would not affect the Southern California Gas Company’s existing plans to implement “aggressive energy efficiency programs” across its gas delivery network in the coming 15 years. (*See*, IS/MND, p. 4.19-2—4.19-3). Again, it offers no justification for the facility’s elected use of natural gas—a fossil fuel—as opposed to electric or other renewable energy sources that power climate control functions in similar facilities. Finally, the IS/MND offers no analysis of transportation energy impacts resulting from daily operation of heavy-duty diesel trucks at the facility, which the IS/MND states will support warehouse operations 24 hours per day. (*See*, IS/MND, p. 4.3-10).

It is clear that the IS/MND’s assertion that the Project’s energy impacts are “less than significant” is unsupported. An EIR is necessary to fully evaluate these impacts and to consider the availability of renewable energy alternatives.

H. The IS/MND Fails to Properly Evaluate Whether Hazardous Waste Exists on the Project Site.

The IS/MND states that the project site does not appear on the Cortese list, a set of public databases listing current and former hazardous waste sites throughout California. (*See*, IS/MND p. 4.9-5). However, despite this assertion, experts with the environmental consulting firm SWAPE found that: "A Phase I Environmental Site Assessment ('ESA') was not prepared for the IS/MND and, therefore, the Project's potential hazards and hazardous materials impacts are inadequately evaluated. An EIR that includes a Phase I ESA is necessary to disclose if environmental conditions, which may be significant and require mitigation, exist at the Project site." (Ex. B., p. 1.) SWAPE described the IS/MND's cursory discussion of hazardous waste impacts as "insufficient" and noted that "[a] complete Phase I ESA, to include an inspection and interviews, is necessary to determine if recommendations are needed to address any 'recognized environmental conditions' ('RECs') that are identified" at the Project site. (*Id.*, p. 2.)

SWAPE's expert analysis makes clear that a fair argument exists that the Project will have significant hazardous waste impacts. Notably, SWAPE advises that, "To provide for adequate disclosure of impacts, and to identify any necessary mitigation, a Phase I ESA is necessary for inclusion in an EIR to evaluate the potential for RECs at the Project site. If a REC is identified, a Phase II should be conducted to sample for potential contaminants. Any contamination that is identified above regulatory screening levels, including those established by the California Department of Toxics Substances Control[2], should be further evaluated and cleaned up, if necessary, in coordination with the Regional Water Quality Control Board and the California Department of Toxics Substances Control." (*Id.*) Therefore, an EIR is required to adequately evaluate the possible presence of hazardous waste on the Project site.

I. The IS/MND Improperly Relies on "Deferred Mitigation" of Possible Future Hazardous Waste Impacts.

In addition to SWAPE's observations regarding the possible presence of hazardous waste on the Project site, *supra*, the IS/MND states that, at the time of writing, "the future tenant(s) of the proposed building were unknown," and that, as such, the "future tenant may require the routine transportation and handling of hazardous materials can result in accidental spills, leaks, toxic releases, fire, or explosion. (*See*, IS/MND, p. 4.9-2.). It continues: "**[T]here is a potential that the proposed project could create a significant hazard to the public or the environment** during operation through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment." (*See*, IS/MND, p. 4.9-4 [emph. added].) The occurrence of such an event is not a distant hypothetical. For instance, the IS/MND notes that neighboring residences are located within "143 feet west of the project site" and "approximately 385 feet southwest of the project site (Google Earth Pro, 2021)." (*See*, IS/MND, p. 4.9-2). Local residents would thus be directly impacted in the event of a future hazardous waste emergency occurring at the Project site.

The courts expressly disapprove of this "deferred" approach to mitigation of potential future environmental impacts. For instance, the Court of Appeal has held that "**CEQA requires consideration of the potential environmental effects of the project actually approved by the public agency, *not some hypothetical project***. (Cf. *County of Inyo, supra,* 71 Cal.App.3d 185, 199; *City of San Jose v. Great Oaks Water Co.* (1987) 192 Cal.App.3d 1005, 1017 [237 Cal.Rptr. 845].)" (*McQueen v. Board of Directors* (1988) 202 Cal.App.3d 1136, 1146 [emph. added].) Similarly, the Court has noted that "**tentative plans for future mitigation after completion of the CEQA process significantly undermines CEQA's goals of full disclosure and informed decision making**; and consequently, these mitigation plans have been overturned on judicial review as constituting improper deferral of environmental assessment. (*Communities for a Better Environment v. City of Richmond* (2010) 184 Cal.App.4th 70, 92 [emph. added].)

Thus, the IS/MND cannot properly conclude that the sole proposed mitigation measure – involving compliance with state and federal hazardous waste regulations ("HAZ-1"), "identif[ication of] routes along which hazardous materials may routinely be transported" (MM HAZ-1), and "develop[ment of] an emergency response plan that can be implemented in the event of an unauthorized release of hazardous materials (MM HAZ-1)" – will guarantee that the Project's hazardous waste impacts will be less than significant. (*See*, IS/MND, p. 4.9-3). Rather, the City must fully consider the Project's potential environmental impacts and propose adequate mitigation measures *prior* to approval, and provide a robust analysis of the Project's potential future impacts stemming from hazardous waste activities in an EIR.

IV. CONCLUSION

For the foregoing reasons, the IS/MND for the proposed Project is in violation of CEQA. Namely, substantial evidence supports a fair argument that the Project may have significant impacts on threatened wildlife, air quality, greenhouse gas emissions, human health, energy, and hazardous waste. Moreover, the IS/MND failed to adequately investigate baseline conditions or mitigate the Project's likely impacts. SAFER therefore respectfully requests that you deny approval of the IS/MND and direct the Fontana Planning Department to prepare an EIR for the proposed Project. Thank you for considering these comments.

Sincerely,

Adam Frankel
LOZEAU | DRURY LLP

EXHIBIT A

Shawn Smallwood, PhD
3108 Finch Street
Davis, CA 95616

Cecily Session-Goins, Associate Planner
City of Fontana Planning Department
8353 Sierra Avenue
Fontana, CA 92335-3528

4 July 2022

RE: Amazing 34 Distribution Center

Dear Ms. Session-Goins,

I write to comment on the Initial Study/Mitigated Negative Declaration (IS/MND) prepared for the proposed Summit Avenue Warehouse project, which I understand would add a warehouse with 102,380 sf of floor space on 4.49 acres on the east side of Sierra Avenue and north of Summit Avenue, Fontana, California (City of Fontana 2022). In support of my comments, I reviewed a habitat assessment prepared by Ultrasystems (2022).

My qualifications for preparing expert comments are the following. I hold a Ph.D. degree in Ecology from University of California at Davis, where I subsequently worked for four years as a post-graduate researcher in the Department of Agronomy and Range Sciences. My research has been on animal density and distribution, habitat selection, interactions between wildlife and human infrastructure and activities, conservation of rare and endangered species, and on the ecology of invading species. I authored numerous papers on special-status species issues. I served as Chair of the Conservation Affairs Committee for The Wildlife Society – Western Section. I am a member of The Wildlife Society and the Raptor Research Foundation, and I've been a part-time lecturer at California State University, Sacramento. I was Associate Editor of wildlife biology's premier scientific journal, The Journal of Wildlife Management, as well as of Biological Conservation, and I was on the Editorial Board of Environmental Management. I have performed wildlife surveys in California for thirty-five years, including at many proposed project sites. My CV is attached.

SITE VISIT

On my behalf, Noriko Smallwood, a wildlife biologist with a Master's Degree from California State University Los Angeles, visited the site of the proposed project for 2.167 hours from 06:25 to 08:38 hours on 28 June 2022. She walked the site's west perimeter, stopping to scan for wildlife with the use of binoculars. The sky was clear with no wind, and temperatures ranged 73–82° F.

The site was covered by low-stature vegetation and surrounded by scattered ornamental trees and shrubs (Photos 1 and 2). The site composed an island of open space that would attract any wildlife in search of opportunities to breed, forage, or stop-over during long-distance travel.

Photos 1 and 2. *Views of the site of the proposed project, 28 June 2022.*

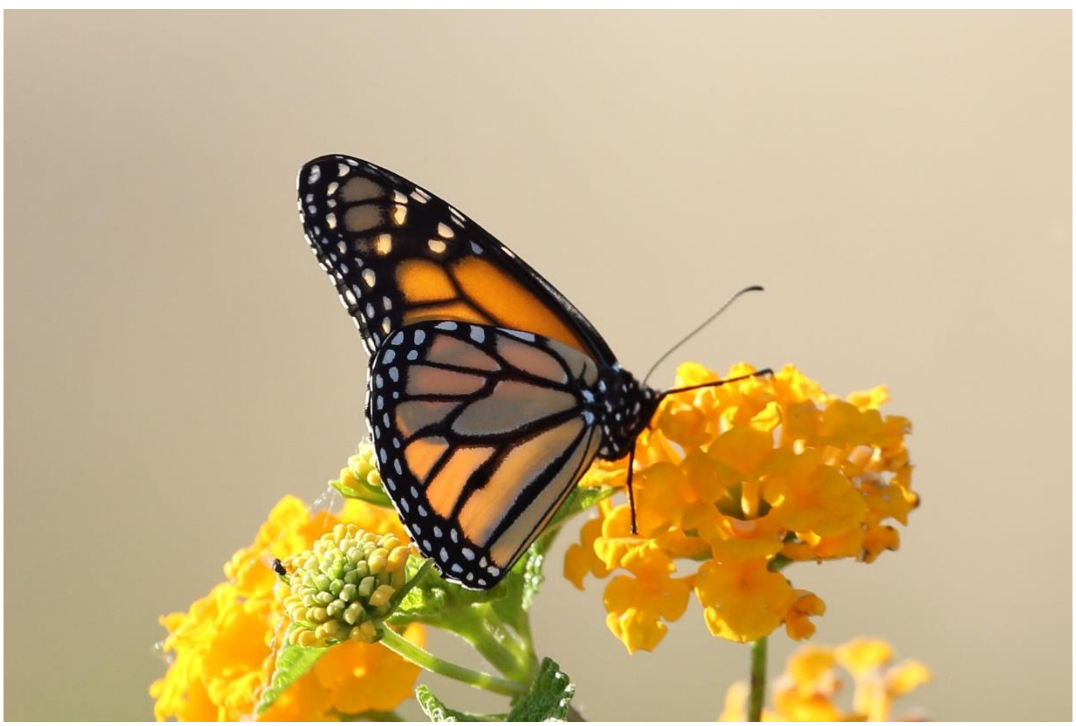
Noriko detected 16 species of vertebrate wildlife at the site (Table 1), as well as 2 species of invertebrate wildlife of significance. She saw members of 3 special-status species of wildlife. Noriko saw at least 56 animals. She saw harvester ants (*Pogonomermyx californicus*), which are significant ecological keystone species for their roles in soil bioturbation and as prey to Blainville's horned lizards and other species. Noriko saw Monarch butterfly (Photo 3), northern mockingbirds and mourning doves (Photos 4 and 5), California horned larks (Photo 6), Anna's hummingbird and western side-blotched lizard (Photos 7 and 8), and numerous burrows of Botta's pocket gopher and an unidentified species of kangaroo rat (Photos 9 and 10).

Table 1. *Species of wildlife Noriko observed at the project site during 2.167 hours of survey starting at 06:25 on 28 June 2022.*

Common name	Species name	Status[1]	Notes
Monarch	*Danaus plexippus*	FC	
Western side-blotched lizard	*Uta stansburiana elegans*		
Rock pigeon	*Columba livia*	Non-native	
Mourning dove	*Zenaida macroura*		
Anna's hummingbird	*Calypte anna*		
Red-shouldered hawk	*Buteo lineatus*	BOP	
Black phoebe	*Sayornis nigricans*		
American crow	*Corvus brachyrhynchos*		
Common raven	*Corvus corax*		
California horned lark	*Eremophila alpestris actia*	WL	
Northern mockingbird	*Mimus polyglottos*		
European starling	*Sturnus vulgaris*	Non-native	
House sparrow	*Passer domesticus*	Non-native	Just offsite
House finch	*Haemorphous mexicanus*		
Lesser goldfinch	*Spinus psaltria*		
Kangaroo-rat spp.	*Dipodomys spp.*		
Botta's pocket gopher	*Thomomys bottae*		

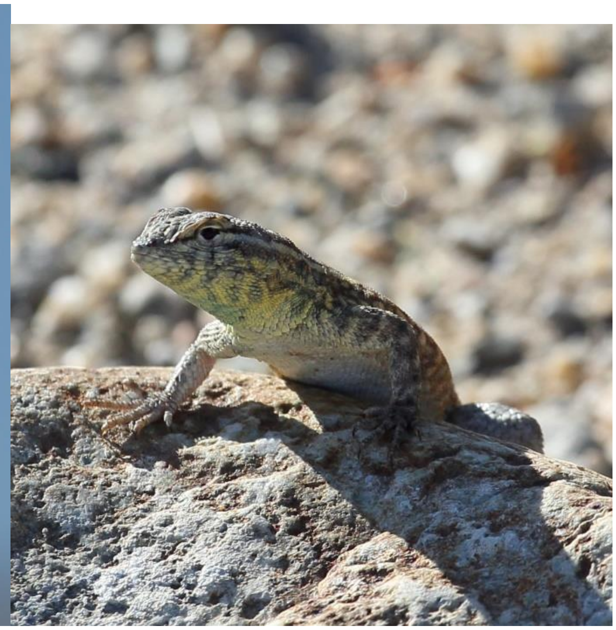
[1] Listed as FC = Federal Candidate for listing, WL = Taxa to Watch List (Shuford and Gardali 2008), and BOP = Birds of Prey (California Fish and Game Code 3503.5).

Photo 3. *Monarch nectaring on the project site, 28 June 2022. Photo by Noriko Smallwood.*



Photos 4 and 5. *Northern mockingbird with prey (left) and mourning dove (right) at the project site, 28 June 2022. Photos by Noriko Smallwood.*

Photo 6. *California horned larks on the project site, 28 June 2022. Photo by Noriko Smallwood.*

Photos 7 and 8. *Anna's hummingbird chasing volant insects (left) and a western side-blotched lizard (right) at the project site, 28 June 2022. Photos by Noriko Smallwood.*

Photo 9. *Soil mounds of Botta's pocket gopher on the project site, 28 June 2022. Photo by Noriko Smallwood.*

Photo 10. *Burrow of an unidentified species of kangaroo rat on the project site, 28 June 2022. Photo by Noriko Smallwood.*

Noriko Smallwood certifies that the foregoing survey results are true and accurately reported.

Noriko Smallwood

BASELINE SETTING

The first step in analysis of potential project impacts to biological resources is to accurately characterize the biological baseline, including the biological species that use the site, their relative abundances, how they use the site, key ecological relationships, and known and ongoing threats to those species with special status. A reasonably accurate characterization of the environmental setting can provide the basis for determining whether the site holds habitat value to wildlife, as well as a baseline against which to analyze potential project impacts. Methods to achieve this first step typically include surveys of the site for biological resources and reviews of literature, databases and local experts for documented occurrences of special-status species. In the case of this project, these essential steps remain grossly incomplete. Herein I provide some characterization of the wildlife community as a component of the current environmental setting, including the identification of special-status species likely to use the site at one time or another.

Environmental Setting informed by Field Surveys

UltraSystems (2022) surveyed the project site for biological resources on 5 August 2021. UltraSystems (2022) detected the occurrences of another 5 species of vertebrate wildlife that were not detected by Noriko, including western fence lizard (*Sceloporus occidentalis*), semi-palmated plover (*Charadrius semipalmatus*), northern mockingbird (*Mimus polyglottos*), coyote (*Canis latrans*), and California ground squirrel (*Otospermophilus beecheyi*). These species added to the 16 species observed by Noriko brings the running total to 21 species of vertebrate wildlife. Photo 16 of UltraSystems (2022: Attachment 3) shows a complex of small mammal burrows, which appear to have been California vole (*Microtus californicus*) burrows – a 22nd species detected on site but not identified by UltraSystems. Note, however, that Noriko detected 3.2 times the number that UltraSystems did, even though UltraSystems had complete access to the site whereas Noriko surveyed only from the west edge of the site.

The difference in survey outcomes between Noriko and UltraSystems (2022) might have resulted from UltraSystems sending out their biologist with 7 survey objectives to be completed simultaneously – a set of objectives no biologist should be expected to perform well all at the same time. The objectives of the UltraSystems biologist were (1) Habitat assessment and land cover type mapping, (2) Sensitive plant community assessment, (3) General plant survey, (4) General wildlife survey, (5) SBKR habitat assessment, (6) Jurisdictional waters/wetlands assessment, and (7) Wildlife movement evaluation. Each one of these objectives would be most effectively achieved by dedicated survey; pursuing any two of them simultaneously would diminish the reliability of survey outcomes. Pursuing all seven objectives simultaneously could not yield defensible results.

It is possible that UltraSystems' (2022) survey was separated into 7 surveys begun at 7 different times in pursuit of the 7 objectives on 5 August 2021, but the reporting of the survey neglected to include sufficient detail to determine whether this was the case. It was probably not the case. The start time of the wildlife survey might also have been a factor explaining why Noriko found 3.2 times the number of wildlife species than UltraSystems did, but UltraSystems did not report this important detail. Neither did UltraSystems report how long the survey lasted – another important methodological detail.

According to UltraSystems (2022:27), “No federally listed endangered, threatened, or candidate wildlife species were observed during the field survey” This seemingly factual statement is actually pseudoscientific, because the surveys were not detection surveys, meaning they were not designed, nor were they performed, to provide reasonable probability of detection of any given special-status species. During her brief survey from the sideline, Noriko saw Monarch butterfly, which is a candidate for federal listing, and she saw California horned larks and red-shouldered hawk. Noriko also saw burrows of kangaroo rats, which could very well be those of San Bernardino kangaroo rat – a species that is federally endangered, a candidate for California endangered and California Species of Special Concern. In summary, the fact that UltraSystems did not detect any special-status species at the site is unsurprising considering their methodology, but I Noriko detected 3 special-status species including a candidate for federal listing and quite possibly the endangered San Bernardino kangaroo rat.

That UltraSystems (2022) detected 4 or 5 species (80-83%) of wildlife that Noriko did not, and that Noriko found 15 species (94%) of wildlife that UltraSystems did not, reveals the probabilistic nature of reconnaissance-level surveys or, as UltraSystems (2022) termed, general wildlife surveys. These surveys, unlike protocol-level detection surveys, are not optimized to detect particular special-status species. Nor are these surveys optimized for obtaining species inventory as a representation of the site’s wildlife community, whose membership changes by time of day, season and year, and whose detectability also changes by the same factors as well as by methodology and investigator experience. Much more effort would be needed to achieve the minimum standards of detection surveys for any given special-status species, and much more effort would be needed to accurately inventory the wildlife community. One needs to be very careful when interpreting the outcome of a reconnaissance-level survey.

A reconnaissance-level survey can be useful for confirming presence of species that were detected, but it can also be useful for estimating the number of species that were not detected. One can model the pattern in species detections during a survey as a means to estimate the number of species that used the site but were undetected during the survey. To support such a modeling effort, the observer needs to record the times into the survey when each species was first detected. The cumulative number of species’ detections increases with increasing survey time, but eventually with diminishing returns (Figure 1). In the case of Noriko’s survey, the pattern in the data (Figure 1) predicts that had Noriko spent more time on site, or had she help from additional biologists, she would have detected 23 species of vertebrate wildlife during the morning of 28 June 2022. This modeling approach is useful for more realistically representing the species richness of the site at the time of a survey, but it cannot represent the species richness throughout the year or across multiple years because many species are seasonal or even multi-annual in their movement patterns and in their occupancy of habitat.

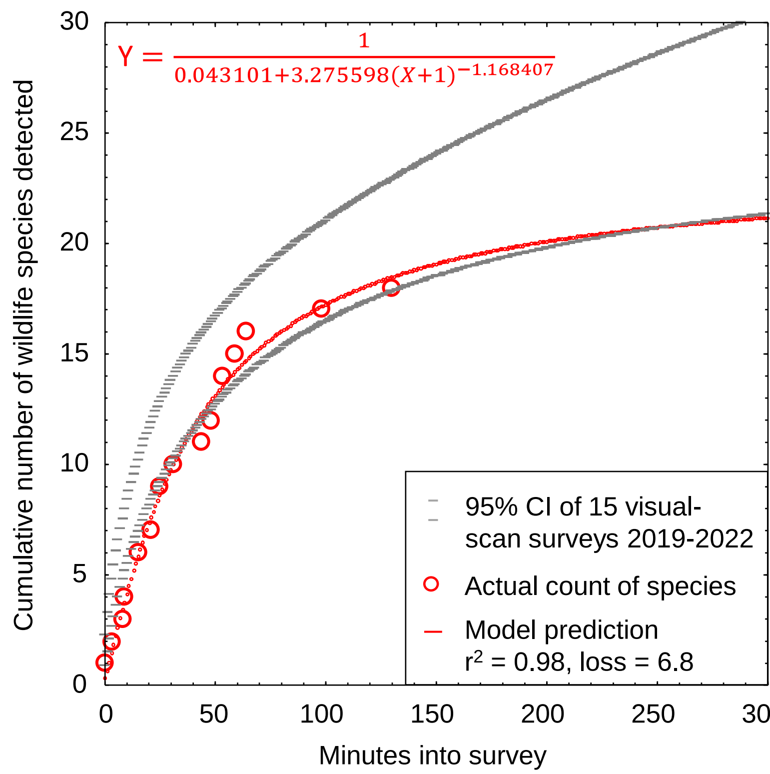


Figure 1. *Actual (red circles) and predicted (red line) relationships between the number of vertebrate wildlife species detected and the elapsed survey time based on Noriko Smallwood's visual-scan survey on 28 June 2022, and compared to the mean and 95% CI of surveys at 15 sites she and I performed at proposed project sites in the Inland Empire and Moreno Valley region. Note that the relationship would differ if the survey was based on another method or during another season.*

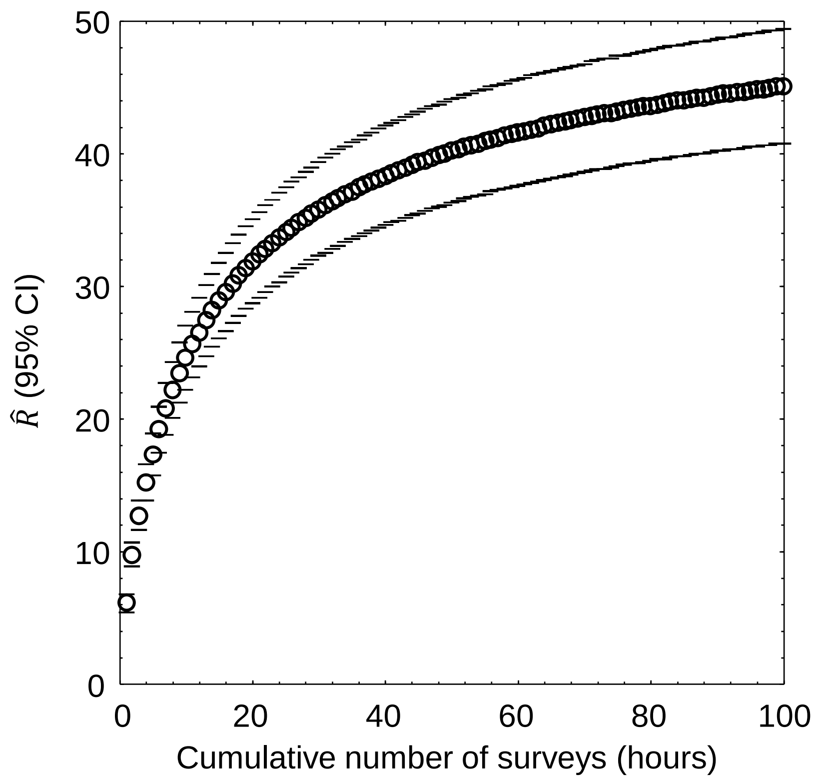
Figure 1 also reveals that the richness of the wildlife community at the project site is at within the 95% CI of mean species richness among the proposed project sites Noriko and I have surveyed in the region of the project site over the past three years. Relative to other proposed project sites in the region, the site of the proposed project supports lower species richness, but the model nevertheless predicts 23 species could have been detected that very morning of the 28th had more biologists been available. The site supports plenty of species of wildlife, and there can be no doubt that it provides ample habitat value to wildlife – more than this model can predict, because the model is based on one survey of one morning.

By use of an analytical bridge, a modeling effort applied to data collected elsewhere can predict the number of vertebrate wildlife species likely making use of the site over the longer term. As part of my research, I completed a much larger survey effort across 167 km^2 of annual grasslands of the Altamont Pass Wind Resource Area, where from 2015 through 2019 I performed 721 1-hour visual-scan surveys, or 721 hours of surveys, at 46 stations. I used binoculars and otherwise the methods were the same as the methods Noriko and I and other consulting biologists use for surveys at proposed project sites. At each of the 46 survey stations, I tallied new species detected with each sequential survey at that station, and then related the cumulative species detected to the hours (number of surveys, as each survey lasted 1 hour) used to accumulate my counts of species detected. I used combined quadratic and simplex methods of estimation in Statistica to estimate least-squares, best-fit nonlinear models of the number of cumulative species detected regressed on hours of survey (number of surveys) at the station: $\hat{R} = \frac{1}{1/a + b \times (Hours)^c}$, where $\hat{R}$ represented cumulative species richness detected.

The coefficients of determination, r^2, of the models ranged 0.88 to 1.00, with a mean of 0.97 (95% CI: 0.96, 0.98); or in other words, the models were excellent fits to the data.

I projected the predictions of each model to thousands of hours to find predicted asymptotes of wildlife species richness. The mean model-predicted asymptote of species richness was 57 after 11,857 hours of visual-scan surveys among the 46 stations. I also averaged model predictions of species richness at each incremental increase of number of surveys, i.e., number of hours (Figure 2). On average I detected 10.2 species over the first 2.167 hours of surveys in the Altamont Pass (2.167 hours to match the number of hours I surveyed at the project site), which composed 17.9% of the total predicted species I would detect with a much larger survey effort. Given the example illustrated in Figure 2, the 16 species Noriko detected after her 2.167 hours of survey at the project site likely represented 17.9% of the species to be detected after many more visual-scan surveys over another year or longer. With many more repeat surveys through the year, Noriko would likely detect $^{16}/_{0.179}$ = 89 species of vertebrate wildlife at the site.

Figure 2. *Mean (95% CI) predicted wildlife species richness, $\hat{R}$, as a nonlinear function of hour-long survey increments across 46 visual-scan survey stations across the Altamont Pass Wind Resource Area, Alameda and Contra Costa Counties, 2015–2019.*

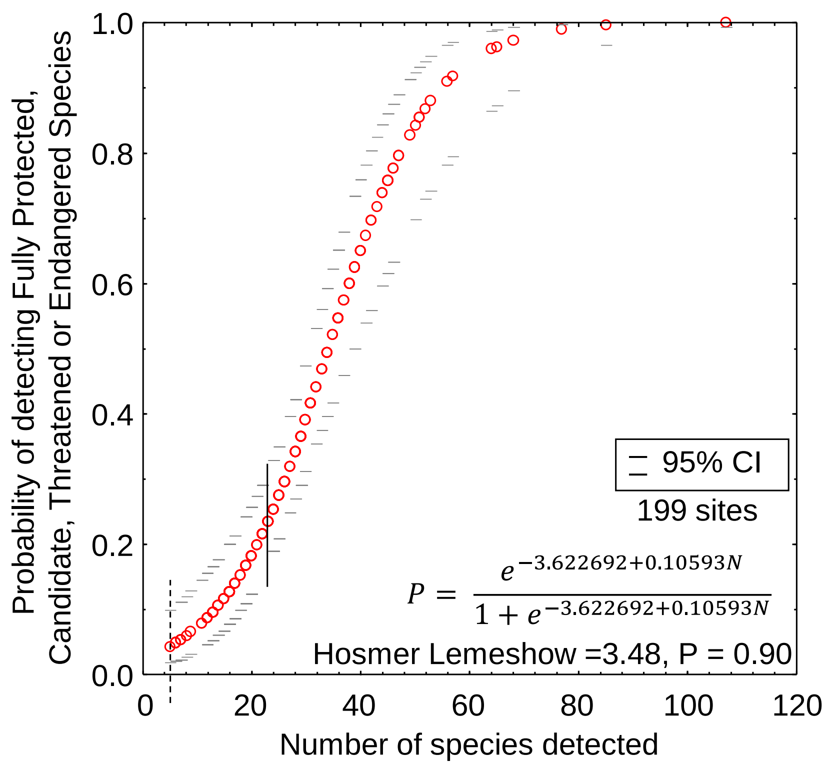


Again, however, my prediction of 89 species of vertebrate wildlife is derived from visual-scan surveys during the daytime, and would not detect nocturnal mammals. The true number of species composing the wildlife community of the site must be larger. A reconnaissance-level survey should serve only as a starting point toward characterization of a site's wildlife community, but it certainly cannot alone inform of the inventory of species that use the site. Without careful interpretation, UltraSystems' survey outcome should not represent baseline conditions, because there were truly many more species that used the site at the time of the survey than were detected by

UltraSystems. UltraSystems managed to detect but a very small fraction of the wildlife community that occurs at the site, having detected only 5 of ≥89, or 5.6% of diurnally active species.

Additionally, the likelihood of detecting special-status species is typically lower than that of more common species. This difference can be explained by the fact that special-status species tend to be rarer and thus less detectable than common species. Special-status species also tend to be more cryptic, fossorial, or active during nocturnal periods when reconnaissance surveys are not performed. Another useful relationship from careful recording of species detections and subsequent comparative analysis is the probability of detection of listed species as a function of an increasing number of vertebrate wildlife species detected (Figure 3). (Note that listed species number fewer than special-status species, which are inclusive of listed species. Also note that I include California Fully Protected species and federal Candidate species as "listed" species.)

Figure 3. *Probability of detecting ≥1 Candidate, Threatened or Endangered Species of wildlife listed under California or federal Endangered Species Acts, based on survey outcomes logit-regressed on the number of wildlife species Noriko Smallwood and I detected during surveys at 199 project sites in California, 1999-2022. The solid vertical line represents the number of species Noriko detected, and the dashed vertical line represents the number of species detected by UltraSystems.*



As demonstrated in Figures 1 and 2, the number of species detected is largely a function of survey effort. Greater survey effort also increases the likelihood that listed species will be detected (which is the first tenet of detection surveys for special-status species). Based on the outcomes of surveys earlier completed at 199 project sites, Noriko's survey effort at the project site carried an 23% chance of detecting a listed species, whereas the survey effort of UltraSystems carried a 4% chance. Listed species of vertebrate wildlife likely use the site, but conclusively documenting their use would take more survey effort to achieve a reasonable likelihood of detection. No reconnaissance-level survey is capable of detecting enough of the wildlife species that occur at a site to realistically characterize the site's wildlife community, including the site's special-status species. A fair argument can be made for the need to prepare an EIR that is better informed by biological resources surveys and by appropriate interpretation of survey outcomes for the purpose of characterizing the wildlife community as part of the current environmental setting.

Environmental Setting informed by Desktop Review

As I noted earlier, the other first step toward characterization of the wildlife community as part of baseline conditions is to review literature, databases and local experts for documented occurrences of special-status species around the site. In support of the IS/MND, UltraSystems (2022) reviewed the California Natural Diversity Data Base (CNDDB) to identify species for which to determine occurrence likelihoods. Had eBird and iNaturalist also been reviewed, determinations of occurrence likelihood would have been made for many additional species (Table 2). In my assessment based on data base reviews and the site visits by Noriko and UltraSystems, 103 special-status species of wildlife potentially use the site at one time or another. Of these, 3 (3%) were confirmed on site by survey visits, 43 (43%) have been documented within 1.5 miles of the site ('Very close'), 8 (8%) within 1.5 and 3 miles ('Nearby'), and another 38 (38%) within 3 to 30 miles ('In region'). More than half (52%) of the special-status species in Table 2 have been recorded within only 3 miles of the project site, which means the site carries a lot of potential for supporting special-status species of wildlife. That the site is now an island of remaining habitat is all the more reason to expect that special-status species occur there – where else could they occur anymore?

Whereas my review reveals 103 special-status species with potential to occur on site, the ISD/MND addresses only 22 of these. Of these 22 species, the IS/MND determines 16 (73%) to have no chance for occurrence, 3 (14%) to have low occurrence potential, and 3 (14%) to have moderate potential. Of the 16 species the IS/MND determines have no potential, 4 (25%) have been documented within 1.5 miles of the project site, 3 (19%) have been documented within 1.5 and 3miles of the site. Of the 3 species the IS/MND determines have low potential, 2 (67%) have been documented within 1.5 miles of the project site and the same is true of species the IS/MND determines to have moderate potential. The site holds much more potential for supporting special-status species of wildlife than determined in the IS/MND.

Table 2. *Occurrence likelihoods of special-status bird species at or near the proposed project site, according to UltraSystems (2022) and to site visits and publicly available occurrence databases, where "very close" indicates within 1.5 miles of the site, "nearby" indicates within 1.5 and 3 miles, and "in region" indicates within 3 and 30 miles.*

Common name	***Species name***	**Status[1]**	**Occurrence likelihood (UltraSystems)**	**Data base records, Site visits**
Monarch	*Danaus plexippus*	FC		**On site**
Crotch's bumble bee	*Bombus crotchii*	CCE	Low	Very close
Delhi sands flower-loving fly	*Rhaphiomidas terminatus abdominalis*	FE	None	In region
Western spadefoot	*Spea hammondii*	SSC	None	Nearby
Arroyo toad	*Anaxyrus californicus*	FE, SSC	None	In region
Western pond turtle	*Emys marmorata*	SSC		In region
Coast horned lizard	*Phrynosoma blainvillii*	SSC	None	Very close
Coastal whiptail	*Aspidoscelis tigris stejnegeri*	SSC	None	In region
California legless lizard	*Anniella spp.*	SSC	None	Very close
California glossy snake	*Arizona elegans occidentalis*	SSC	None	In region
Coast patch-nosed snake	*Salvadora hexalepis virgultea*	SSC		In region
Two-striped gartersnake	*Thamnophis hammondii*	SSC	None	In region
Redhead	*Aythya americana*	SSC		Nearby
Western grebe	*Aechmophorus occidentalis*	BCC		In region
Clark's grebe	*Aechmophorus clarkii*	BCC		In region
Black swift	*Cypseloides niger*	SSC, BCC		In region
Vaux's swift	*Chaetura vauxi*	SSC2		Very close
Costa's hummingbird	*Calypte costae*	BCC		Very close
Rufous hummingbird	*Selasphorus rufus*	BCC		Very close
Allen's hummingbird	*Selasphorus sasin*	BCC		Very close
Whimbrel	*Numenius phaeopus*	BCC		In region
Long-billed curlew	*Numenius americanus*	BCC, WL		In region
Marbled godwit	*Limosa fedoa*	BCC		In region
Western gull	*Larus occidentalis*	BCC		Very close
California gull	*Larus californicus*	WL, BCC		Very close
Caspian tern	*Hydroprogne caspia*	BCC		In region

Common name	***Species name***	**Status[1]**	**Occurrence likelihood (UltraSystems)**	**Data base records, Site visits**
Common loon	*Gavia immer*	SSC		In region
Double-crested cormorant	*Phalacrocorax auritus*	WL		Very close
American white pelican	*Pelacanus erythrorhynchos*	SSC1		Nearby
California brown pelican	*Pelecanus occidentalis californicus*	CFP		In region
Least bittern	*Ixobrychus exilis*	SSC		In region
White-faced ibis	*Plegadis chihi*	WL		Very close
Turkey vulture	*Cathartes aura*	BOP		Very close
Osprey	*Pandion haliaetus*	WL, BOP		Very close
White-tailed kite	*Elanus luecurus*	CFP, WL, BOP		In region
Golden eagle	*Aquila chrysaetos*	BGEPA, CFP, BOP		Very close
Northern harrier	*Circus cyaneus*	SSC3, BOP		Very close
Sharp-shinned hawk	*Accipiter striatus*	WL, BOP		Very close
Cooper's hawk	*Accipiter cooperii*	WL, BOP	Moderate	Very close
Bald eagle	*Haliaeetus leucocephalus*	BGEPA, BCC, CFP		In region
Red-shouldered hawk	*Buteo lineatus*	BOP		**On site**
Swainson's hawk	*Buteo swainsoni*	CT, BOP		Very close
Red-tailed hawk	*Buteo jamaicensis*	BOP		Very close
Ferruginous hawk	*Buteo regalis*	WL, BOP		Very close
Barn owl	*Tyto alba*	BOP		Very close
Western screech-owl	*Megascops kennicotti*	BOP		In region
Great horned owl	*Bubo virginianus*	BOP		Very close
Burrowing owl	*Athene cunicularia*	BCC, SSC2, BOP	None	Nearby
Long-eared owl	*Asio Otis*	SSC3, BOP		In region
Short-eared owl	*Asia flammeus*	BCC, SSC3, BOP		In region
Lewis's woodpecker	*Melanerpes lewis*	BCC		In region
Nuttall's woodpecker	*Picoides nuttallii*	BCC		Very close
American kestrel	*Falco sparverius*	BOP		Very close
Merlin	*Falco columbarius*	WL, BOP		Very close
Peregrine falcon	*Falco peregrinus*	CFP, BOP, BCC		Very close
Prairie falcon	*Falco mexicanus*	BCC, WL, BOP		Very close

Common name	***Species name***	**Status**[1]	**Occurrence likelihood (UltraSystems)**	**Data base records, Site visits**
Olive-sided flycatcher	*Contopus cooperi*	BCC, SSC2		Very close
Willow flycatcher	*Empidonax trailii*	CE, BCC		Very close
Vermilion flycatcher	*Pyrocephalus rubinus*	SSC2		In region
Least Bell's vireo	*Vireo bellii pusillus*	FE, CE	None	In region
Loggerhead shrike	*Lanius ludovicianus*	BCC, SSC2		Very close
Oak titmouse	*Baeolophus inornatus*	BCC		Very close
California horned lark	*Eremophila alpestris actia*	WL		**On site**
Bank swallow	*Riparia riparia*	CT		In region
Purple martin	*Progne subis*	SSC2		Very close
Wrentit	*Chamaea fasciata*	BCC		Very close
California gnatcatcher	*Polioptila c. californica*	CT, SSC	None	Very close
California thrasher	*Toxostoma redivivum*	BCC		Very close
Cassin's finch	*Haemorhous cassinii*	BCC		In region
Lawrence's goldfinch	*Spinus lawrencei*	BCC		Very close
Grasshopper sparrow	*Ammodramus savannarum*	SSC2		In region
Black-chinned sparrow	*Spizella atrogularis*	BCC		In region
Brewer's sparrow	*Spizella breweri*	BCC		Very close
Bell's sparrow	*Amphispiza b. belli*	WL, BCC	None	Nearby
Oregon vesper sparrow	*Pooecetes gramineus affinis*	SSC2, BCC		Very close
Southern California rufous-crowned sparrow	*Aimophila ruficeps canescens*	WL		Nearby
Yellow-breasted chat	*Icteria virens*	SSC3		Very close
Yellow-headed blackbird	*Xanthocephalus xanthocephalus*	SSC3		Nearby
Bullock's oriole	*Icterus bullockii*	BCC		Very close
Tricolored blackbird	*Agelaius tricolor*	CT, BCC, SSC	None	In region
Lucy's warbler	*Leiothlypis luciae*	SSC, BCC		In region
Virginia's warbler	*Leiothlypis virginiae*	WL, BCC		In region
Yellow warbler	*Dendroica petechia*	BCC, SSC2	None	Very close
Summer tanager	*Piranga rubra*	SSC1		In region
Pallid bat	*Antrozous pallidus*	SSC, WBWG:H		In range

Common name	***Species name***	**Status[1]**	**Occurrence likelihood (UltraSystems)**	**Data base records, Site visits**
Townsend's big-eared bat	*Corynorhinus townsendii*	SSC, WBWG:H		In region
Western red bat	*Lasiurus blossevillii*	SSC, WBWG:H		In region
Hoary bat	*Lasiurus cinereus*	WBWG:M		In region
Western yellow bat	*Lasiurus xanthinus*	SSC, WBWG:H	None	In range
Western small-footed myotis	*Myotis cililabrum*	WBWG:M		In range
Miller's myotis	*Myotis evotis*	WBWG:M		In range
Fringed myotis	*Myotis thysanodes*	WBWG:H		In range
Long-legged myotis	*Myotis volans*	WBWG:H		In range
Yuma myotis	*Myotis yumanensis*	WBWG:LM		In region
Western mastiff bat	*Eumops perotis*	SSC, WBWG:H		In range
San Diego black-tailed jackrabbit	*Lepus californicus bennettii*	SSC	Low	Nearby
Northwestern San Diego pocket mouse	*Chaetodipus fallax fallax*	SSC	Moderate	Very close
San Bernardino kangaroo rat	*Dipodomys merriami parvus*	FE, CCE, SSC	Low	Very close, probably **on site**
Stephens' kangaroo rat	*Dipodomys stephensi*	FE, CT		In range
Los Angeles pocket mouse	*Perognathus longimembris brevinasus*	SSC	Moderate	In range
Bryant's woodrat	*Neotoma lepida intermedia*	SSC	None	In region
Southern grasshopper mouse	*Onychomys torridus ramona*	SSC		In range
American badger	*Taxidea taxus*	SSC		In range

[1] Listed as FE or FC = federal endangered or candidate endangered, BCC = U.S. Fish and Wildlife Service Bird of Conservation Concern, CE, CT, CCE = California endangered, threatened, and Candidate California Endangered, CFP = California Fully Protected (CFG Code 3511), SSC = California species of special concern, SSC1, SSC2 and SSC3 = California Bird Species of Special Concern priorities 1, 2 and 3, respectively (Shuford and Gardali 2008), WL = Taxa to Watch List (Shuford and Gardali 2008), BOP = Birds of Prey (CFG Code 3503.5), and WBWG = Western Bat Working Group with priority rankings, of low, moderate, and high.

Furthermore, the IS/MND misapplies CNDDB to screen out special-status species not reported within 10 miles of the site. Whereas CNDDB can be helpful for confirming occurrences of special-status species where they have been reported, it cannot be relied upon for determining absences of species. This is because CNDDB relies on volunteer reporting, and it is limited in its spatial coverage by the access of biologists to private properties. The findings reported to CNDDB do not originate from any sort of randomized or systematic sampling across California, nor does CNDDB collect reports of negative findings. Many survey findings are not reported to CNDDB because consulting biologists signed non-disclosure agreements with developers. Furthermore, most wildlife species in California are not reported to CNDDB, because CNDDB is uninterested in them and Scientific Collecting Permits do not require their reporting. Therefore, species recently assigned special status will be under-represented in CNDDB. In the absence of scientific sampling, absence determinations based on CNDDB reporting are vulnerable to multiple biases. The limitations of CNDDB are well-known, and summarized by CDFW in a warning presented on its CNDDB web site, https://wildlife.ca.gov/Data/CNDDB/About: "*We work very hard to keep the CNDDB and the Spotted Owl Database as current and up-to-date as possible given our capabilities and resources. However, we cannot and do not portray the CNDDB as an exhaustive and comprehensive inventory of all rare species and natural communities statewide. Field verification for the presence or absence of sensitive species will always be an important obligation of our customers. Likewise, your contribution of data to the CNDDB is equally important to the maintenance of the CNDDB. …*" A fair argument can be made for the need to prepare an EIR to more appropriately analyze data base records to characterize the current environmental setting.

According to UltraSystems (2022:10), "Previous consultant studies and reports near the project site and project vicinity were reviewed to gain a sense of the existing conditions at the time the studies were conducted." However, I found only one cited study used to inform the findings of UltraSystems (2022). If any othersuch studies were used, their relevance should be clearly summarized and the reports cited.

The IS/MND attaches significance to potential impacts only to habitat where nest sites likely occur, but all parts of a species' habitat is of critical importance to breeding success and productivity. It is not entirely relevant to Cooper's hawk occurrence, therefore, that trees do not grow on site. To successfully breed, any Cooper's hawks attempting to breed in the area likely forage on the project site. Loss of th efood base from this site would likely be devastating to the nearest breeding pair of Cooper's hwak.

The IS/MND's analysis of potential impacts to Los Angeles pocket mouse (LAPM) is recklessly flawed. According to UltraSystems (2022), "Although suitable habitat for LAPM was observed on the project site, these areas were small and represent a very small fraction of suitable habitat statewide for these species. A complex of approximately 20 small mammal burrows were observed on the norther border of the project site during the habitat assessment survey. These burrows could potentially be used by LAPM. Construction of the project would involve grading of the entire project site and these burrows would be destroyed. Although there is suitable habitat for LAPM on the project site, the area of suitable habitat that would be destroyed by grading activities is small and the loss of this area would not have a substantial effect on LAPM's available habitat or population levels statewide. Thus, these impacts do not meet the threshold of significance set forth in Section 15065 of the California Environmental Quality Act (CEQA) Guidelines. Therefore, construction of the project would have a less than significant impact on LAPM." This conclusion is inconsistent with the IS/MND's conclusion in its preceding paragraph: "The conversion of habitat to agricultural, suburban, and urban uses in the San Jacinto and Temecula valleys has greatly reduced and fragmented the historic habitat and its populations in this region. While there are a number of extant populations, many of these are small and are likely to disappear in the coming years (Brylski, 1988-1990a)." If LAPD occurs on the project site, which UltraSystems (2022) thinks they might, then the project would cause a highly significant impact to LAPD. Protocol-level live-trapping for LAPD should be completed, and the results should inform an EIR prepared for the project.

The same applies to northwestern San Diego pocket mouse, which the IS/MND acknowledges to have been documented immediately adjacent to the project site, but which it again claims the loss of a population on the site would be less than significant. Given the Precautionary Principle in risk analysis, and given the foremost principles of CEQA, the burden of evidence is on City of Fontana to prove less than significant impacts to species known or likely to occur on a project site.

The IS/MND's analysis of potential impacts to San Bernardino kangaroo rat is also flawed. The project site occurs within federally designated critical habitat of San Bernardino kangaroo rat, which is also documented to have occurred only 300 m (0.19 miles) from the project site. Table 3 admits to having detected burrows that could have belonged to this species, but then concludes "However, there is no active fluvial system within the BSA, so the habitat is only marginally suitable." But neither was there an active fluvial system where the species was documented 300 m to the northwest. The IS/MND attempts to pigeon-hole San Bernardino kangaroo rat into a narrow portion of the environment so that it can say that that type of environment is absent from the project site. San Bernardino kangaroo rat has a broader habitat than the IS/MND characterizes. And Noriko Smallwood also saw burrows that in my experience working with kangaroo rats look very likely those of kangaroo rats (Photos 15 and 16). Given the evidence that San Bernardino kangaroo rats occur on site, protocol-level live-trapping for this species needs to be completed to inform an EIR.

The IS/MND considers the occurrence likelihood of San Diego black-tailed jackrabbit to be low because "This species is highly mobile and could potentially use the site as a passage to more wooded areas…" San Diego black-tailed jackrabbits do not live in wooded areas. The species has been documented only 1.75 miles away, and as the IS/MND correctly describes, this species is mobile. With all of its other habitat gone from the area, one should expect San Diego black-tailed jackrabbit to find its last remaining refuge on the project site.

Because UltraSystems (2022) found ground squirrels on the project site, protocol-level detection surveys are warranted for burrowing owl (CDFW 2012). These surveys are needed to be consistent with CDFW's guidelines and to inform an EIR.

Photo 15. *Likely burrow of San Bernardino kangaroo rat on the project site, 28 June 2022. Photo by Noriko Smallwood.*

Photo 16. *Likely burrow of San Bernardino kangaroo rat on the project site, 28 June 2022. Photo by Noriko Smallwood.*

BIOLOGICAL IMPACTS ASSESSMENT

Determination of occurrence likelihoods of special-status species is not, in and of itself, an analysis of potential project impacts. An impacts analysis should consider whether and how a proposed project would affect members of a species, larger demographic units of the species, or the whole of a species. In the following, I analyze several types of impacts likely to result from the project, one of which is unsoundly analyzed and the others not analyzed in the IS/MND.

HABITAT LOSS

The IS/MND does not address potential impacts of habitat loss to breeding birds. Habitat loss has been recognized as the most likely leading cause of a documented 29% decline in overall bird abundance across North America over the last 48 years (Rosenberg et al. 2019). Habitat loss not only results in the immediate numerical decline of wildlife, but it also results in permanent loss of productive capacity. For example, a complex of grassland, wetland, and woodland at one study site had a total bird nesting density of 32.8 nests per acre (Young 1948). In another study on a similar complex of vegetation cover, the average annual nest density was 35.8 nests per acre (Yahner 1982). These densities averaged 34.3 nests per acre, but they were from study sites that were wetter than the project site. Assuming the nest density of the project site is only a fifth that documented by Young (1948) and Yahner (1982), an average nest density of 6.86 multiplied against the project's 4.49 acres would estimate a capacity of 31 bird nests annually. Considering the number of birds Noriko saw on site (44), and assuming some of the birds remained hidden on their nests, my assumption that nest density was a fifth that of Young (1048) and Yahner (1982) seems reasonable.

The loss of 31 nest sites of birds would qualify as a significant project impact that has not been addressed in the IS/MND. But the impact does not end with the immediate loss of nest sites as the site is graded in preparation for impervious surfaces. The reproductive capacity of the site would be lost. The average number of fledglings per nest in Young's (1948) study was 2.9. Assuming Young's (1948) study site typifies bird productivity, the project would prevent the production of 90 fledglings per year. After 100 years and further assuming an average bird generation time of 5 years, the lost capacity of both breeders and annual fledgling production would total 10,240 birds {(nests/year × chicks/nest × number of years) + (2 adults/nest × nests/year) × (number of years ÷ years/generation)}. The project's denial to California of 102 birds per year has not been analyzed as a potential impact in the IS/MND, nor does the IS/MND provide any compensatory mitigation for this impact. A fair argument can be made for the need to prepare an EIR to appropriately analyze the project's impacts to wildlife caused by habitat loss and habitat fragmentation.

WILDLIFE MOVEMENT

The IS/MND's analysis of whether the project would interfere with wildlife movement in the region is fundamentally flawed. The IS/MND points to connectivity and corridor maps in the San Gabriel Mountains and Santa Ana River and says the project site is not within any of those. The implied premise is that only disruption of the function of a wildlife corridor can interfere with wildlife movement in the region. This premise, however, represents a false CEQA standard, and is therefore inappropriate to the analysis. The primary phrase of the CEQA standard goes to wildlife movement regardless of whether the movement is channeled by a corridor. A site such as the proposed project site is critically important for wildlife movement because it composes an increasingly diminishing area of open space within a growing expanse of anthropogenic uses, forcing more species of volant wildlife to use the site for stopover and staging during migration, dispersal, and home range patrol (Warnock 2010, Taylor et al. 2011, Runge et al. 2014). The project would cut wildlife off from stopover and staging opportunities, forcing volant wildlife to travel even farther between remaining stopover sites.

TRAFFIC IMPACTS TO WILDLIFE

The IS/MND neglects to address one of the project's most obvious, substantial impacts to wildlife, and that is wildlife mortality and injuries caused by project-generated traffic.

Project-generated traffic would endanger wildlife that must, for various reasons, cross roads used by the project's traffic (Photos 11-14). Vehicle collisions have accounted for the deaths of many thousands of amphibian, reptile, mammal, bird, and arthropod fauna, and the impacts have often been found to be significant at the population level (Forman et al. 2003). Across North America traffic impacts have taken devastating tolls on wildlife (Forman et al. 2003). In Canada, 3,562 birds were estimated killed per 100 km of road per year (Bishop and Brogan 2013), and the US estimate of avian mortality on roads is 2,200 to 8,405 deaths per 100 km per year, or 89 million to 340 million total per year (Loss et al. 2014). Local impacts can be more intense than nationally.

Photo 11. *A Gambel's quail dashes across a road* on *3 April 2021. Such road crossings are usually successful, but too often prove fatal to the animal. Photo by Noriko Smallwood.*

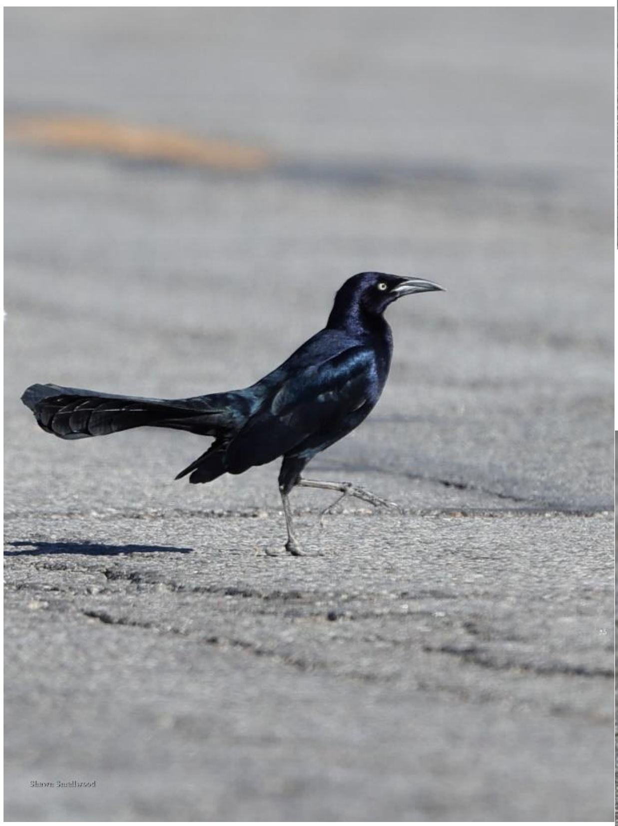


Photo 12. *Great-tailed grackle walks onto a rural road in Imperial County, 4 February 2022.*

Photo 13. *Mourning dove killed by vehicle on a California road. Photo by Noriko Smallwood, 21 June 2020.*

Photo 14. *Raccoon killed on Road 31 just east of Highway 505 in Solano County. Photo taken on 10 November 2018.*

The nearest study of traffic-caused wildlife mortality was performed along a 2.5-mile stretch of Vasco Road in Contra Costa County, California. Fatality searches in this study found 1,275 carcasses of 49 species of mammals, birds, amphibians and reptiles over 15 months of searches (Mendelsohn et al. 2009). This fatality number needs to be adjusted for the proportion of fatalities that were not found due to scavenger removal and searcher error. This adjustment is typically made by placing carcasses for searchers to find (or not find) during their routine periodic fatality searches. This step was not taken at Vasco Road (Mendelsohn et al. 2009), but it was taken as part of another study right next to Vasco Road (Brown et al. 2016). The Brown et al. (2016) adjustment factors were similar to those for carcass persistence of road fatalities (Santos et al. 2011). Applying searcher detection rates estimated from carcass detection trials performed at a wind energy project immediately adjacent to this same stretch of road (Brown et al. 2016), the adjusted total number of fatalities was estimated at 12,187 animals killed by traffic on the road. This fatality number translates to a rate of 3,900 wild animals per mile per year killed along 2.5 miles of road in 1.25 years. In terms comparable to the national estimates, the estimates from the Mendelsohn et al. (2009) study would translate to 243,740 animals killed per 100 km of road per year, or 29 times that of Loss et al.'s (2014) upper bound estimate and 68 times the Canadian estimate. An analysis is needed of whether increased traffic generated by the project site would similarly result in local impacts on wildlife.

For wildlife vulnerable to front-end collisions and crushing under tires, road mortality can be predicted from the study of Mendelsohn et al. (2009) as a basis, although it would be helpful to have the availability of more studies like that of Mendelsohn et al. (2009) at additional locations. My analysis of the Mendelsohn et al. (2009) data resulted in an estimated 3,900 animals killed per mile along a county road in Contra Costa County. Two percent of the estimated number of fatalities were birds, and the balance was composed of 34% mammals (many mice and pocket mice, but also ground squirrels, desert cottontails, striped skunks, American badgers, raccoons, and others), 52.3% amphibians (large numbers of California tiger salamanders and California red-legged frogs, but also Sierran treefrogs, western toads, arboreal salamanders, slender salamanders and others), and 11.7% reptiles (many western fence lizards, but also skinks, alligator lizards, and snakes of various species). VMT is useful for predicting wildlife mortality because I was able to quantify miles traveled along the studied reach of Vasco Road during the time period of the Mendelsohn et al. (2009), hence enabling a rate of fatalities per VMT that can be projected to other sites, assuming similar collision fatality rates.

Predicting project-generated traffic impacts to wildlife

The IS/MND predicts 178 truck daily trips, but offers no prediction of annual vehicle miles traveled (VMT). However, my review of VMT predictions at 26 other project sites yielded a mean 24.4 annual VMT/sf of floorspace. This rate would predict an annual VMT of 2,498,072. During the Mendelsohn et al. (2009) study, 19,500 cars traveled Vasco Road daily, so the vehicle miles that contributed to my estimate of non-volant fatalities was 19,500 cars and trucks × 2.5 miles × 365 days/year × 1.25 years = 22,242,187.5 vehicle miles per 12,187 wildlife fatalities, or 1,825 vehicle miles per fatality. This rate divided into my prediction of 2,498,072 annual VMT due to the project predicts 1,369 vertebrate wildlife fatalities per year. Assuming the project-generated traffic would destroy 40% of this number due to its urbanized surroundings, a more realistic prediction might be 548 vertebrate wildlife fatalities per year. **Operations over 50 years would accumulate 27,400 wildlife fatalities**. It remains unknown whether and to what degree vehicle tires contribute to carcass removals from the roadway, thereby contributing a negative bias to the fatality estimates I made from the Mendelsohn et al. (2009) fatality counts.

Based on my assumptions and simple calculations, the project-generated traffic would cause substantial, significant impacts to wildlife. There is at least a fair argument that can be made for the need to prepare an EIR to analyze this impact. Mitigation measures to improve wildlife safety along roads are available and are feasible, and they need exploration for their suitability with the proposed project.

CUMULATIVE IMPACTS

The analysis in the IS/MND is flawed. According to the IS/MND (page 4.21-2), "The proposed project would be consistent with regional plans and programs that address environmental factors such as air quality, water quality, and other applicable regulations that have been adopted by public agencies with jurisdiction over the project for the purpose of avoiding or mitigating environmental effects." But according to CEQA Guidelines §15064(h)(3), "a project's incremental contribution to a cumulative impact can be found not cumulatively considerable if the project would comply with an approved plan or mitigation program that provides specific requirements that would avoid or substantially lessen the cumulative problem within the geographic area of the project." And "When relying on a plan, regulation or program, the lead agency should explain how implementing the particular requirements in the plan, regulation or program ensure that the project's incremental contribution to the cumulative effect is not cumulatively considerable." The IS/MND specifies no particular regional plan it claims the project would be consistent with, and provides no explanation of how implementing the particular requirements of the unnamed regional plan(s) would minimize, avoid or offset the project's contributions to cumulative impacts.

The analysis is flawed in another manner as well. According to the IS/MND (page 4.21-3), "Because the project would not increase environmental impacts after mitigation measures are incorporated, the incremental contribution to cumulative impacts is anticipated to be less than significant with mitigation incorporated." The IS/MND implies that cumulative effects are simply residual impacts of incomplete mitigation of project-level impacts. This notion is inconsistent with CEQA's definition of cumulative impacts and how to analyze them. If this was CEQA's standard, then cumulative effects analysis would be merely an analysis of mitigation efficacy. The analysis in the IS/MND is based on an assumption that other projects in the area adequately mitigated their impacts to wildlife, thereby leaving no impacts to accumulate. Again, this is not how CEQA defines cumulative impacts and it is inconsistent with the Precautionary Principle in risk analysis directed to rare or precious resources. Even where impacts may be individually limited, their "incremental effects of an individual project are significant when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects." (CEQA Guidelines §15064(h)(1)).

MITIGATION MEASURES

The proposed mitigation measures would provide little conservation benefit to wildlife. Most are empty gestures, because they would provide benefits only if patches of habitat would be left in place, which is not the case with this project.

BIO-1: Pre-Construction Breeding Bird Survey

Preconstruction surveys should be performed for nesting birds, but not as a substitute for detection surveys. Preconstruction surveys are not designed or intended to reduce project impacts. Preconstruction surveys are only intended as last-minute, one-time salvage and rescue operations targeting readily detectable nests or individuals before they are crushed under heavy construction machinery. Because most special-status species are rare and cryptic, and because most bird species are expert at hiding their nests lest they get predated, most of their nests will not be detected by preconstruction surveys without prior support of detection surveys. Locating all of the nests on site would require more effort than is committed during preconstruction surveys.

Detection surveys are needed to inform preconstruction take-avoidance surveys by mapping out where biologists performing preconstruction surveys are most likely to find animals or their breeding sites. Detection surveys were designed by species experts, often undergoing considerable deliberation and review before adoption. Detection surveys often require repeated surveys using methods known to maximize likelihoods of detection. Detection surveys are needed to assess impacts and to inform the formulation of appropriate mitigation measures, because preconstruction surveys are not intended for these roles either. What is missing from the IS/MND, and what is in greater need than preconstruction surveys, is detection surveys consistent with guidelines and protocols that wildlife ecologists have uniquely developed for use with each special-status species and for birds generally. What is also missing is compensatory mitigation of unavoidable impacts.

Following detection surveys, preconstruction surveys should be performed. However, an EIR should be prepared, and it should detail how the results of preconstruction surveys would be reported. Without reporting the results, preconstruction surveys are vulnerable to serving as an empty gesture rather than a mitigation measure. For these reasons, and because the salvage of readily detectable animals or their nests would not prevent the permanent loss of habitat, the proposed mitigation measure is not sufficient to reduce the project's impacts to nesting birds to less than significant levels.

BIO-2: Worker Environmental Awareness Program

Whereas I concur that it is always helpful to educate construction workers about wildlife and wildlife care, worker awareness would not prevent the wholesale destruction of habitat on the project site. This measure provides very little conservation benefit to wildlife.

BIO-3: Construction Best Management Practices

I concur with best practices to minimize runoff contamination of fuel and cement, but these measures would accomplish little to nothing to mitigate impacts to wildlife. They might help to minimize impacts to wildlife off site, but they would not avoid nor compensate for impacts to wildlife on site.

MM BIO-4: Project Limits and Designated Areas

This measure is an empty gesture. The entire site would be converted into the proposed warehouse, impervious surfaces and minimal ornamental landscaping. Project limits and designated areas are meaningless, because the plan is for no habitat to remain anywhere on the project site.

MM BIO-5: General Vegetation and Wildlife Avoidance and Protection Measures

The best practices methods proposed in this measure are also meaningless. The entire site would be converted into the proposed warehouse, impervious surfaces and ornamental landscaping. The proposed measure would protect nothing.

RECOMMENDED MEASURES

The IS/MND proposes only preconstruction surveys and a few best management practices, but no compensatory mitigation for habitat loss or losses to project-generated traffic. A fair argument can be made for the need to prepare an EIR to formulate appropriate measures to mitigate project impacts to wildlife. Below are few suggestions of measures that ought to be considered in an EIR.

Detection Surveys: Protocol-level detection surveys should be implemented for special-status species, and most especially for San Bernardino kangaroo rat, coast horned lizard, and burrowing owl.

Habitat Loss: If the project goes forward, compensatory mitigation would be warranted for habitat loss. An equal area of similar soil/vegetation cover should be protected in perpetuity as close to the project site as possible.

Road Mortality: Compensatory mitigation is needed for the increased wildlife mortality that would be caused by the project-generated road traffic in the region. I suggest that this mitigation can be directed toward funding research to identify fatality patterns and effective impact reduction measures such as reduced speed limits and wildlife under-crossings or overcrossings of particularly dangerous road segments. Compensatory mitigation can also be provided in the form of donations to wildlife rehabilitation facilities (see below).

Fund Wildlife Rehabilitation Facilities: Compensatory mitigation ought also to include funding contributions to wildlife rehabilitation facilities to cover the costs of injured animals that will be delivered to these facilities for care. Many animals would likely be injured by collisions with automobiles.

Thank you for your attention,

Shawn Smallwood

Shawn Smallwood, Ph.D.

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EXHIBIT B

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

2656 29th Street, Suite 201
Santa Monica, CA 90405

Matt Hagemann, P.G, C.Hg.
(949) 887-9013
mhagemann@swape.com

Paul E. Rosenfeld, PhD
(310) 795-2335
prosenfeld@swape.com

July 20, 2022

Victoria Yundt
Lozeau | Drury LLP
1939 Harrison Street, Suite 150
Oakland, CA 94618

Subject: Comments on the Summit Avenue Warehouse Project (APN: 0239-161-28)

Dear Ms. Yundt,

We have reviewed the June 2022 Initial Study and Mitigated Negative Declaration ("IS/MND") for the Summit Avenue Warehouse Project ("Project") located in the City of Fontana ("City"). The Project proposes to construct 92,380-square-feet ("SF") of warehouse space, 10,000-SF of office space, and 56 parking spaces on the 4.49-acre site.

Our review concludes that the IS/MND fails to adequately evaluate the Project's hazards, hazardous materials, air quality, health risk, 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 air quality, health risk, and greenhouse gas impacts that the project may have on the environment.

Hazards and Hazardous Materials

Inadequate Disclosure and Analysis of Impacts

A Phase I Environmental Site Assessment ("ESA") was not prepared for the IS/MND and, therefore, the Project's potential hazards and hazardous materials impacts are inadequately evaluated. An EIR that includes a Phase I ESA is necessary to disclose if environmental conditions, which may be significant and require mitigation, exist at the Project site.

The completion of a Phase I ESA is a common practice under CEQA to provide an adequate basis to disclose hazardous materials impacts that may pose a health risk to the public, workers, or the environment. Standards for performing a Phase I ESA have been established by the US EPA and ASTM

International and are undertaken to identify conditions that may result in the release of hazardous substances.[1] Phase I ESAs include:

- a review of all known sites in the vicinity of the subject property that are on regulatory agency databases undergoing assessment or cleanup activities;
- an inspection;
- interviews with people knowledgeable about the property; and
- recommendations for further actions to address potential hazards.

To determine impacts, the IS/MND only undertook the first step, a review of environmental records (p. 4.9-4). This is an insufficient basis to identify and disclose environmental conditions at the Project site that may necessitate further investigation and mitigation to protect public health.

A complete Phase I ESA, to include an inspection and interviews, is necessary to determine if recommendations are needed to address any "recognized environmental conditions" ("RECs") that are identified. A REC is the presence or likely presence of any hazardous substances or petroleum products on a property under conditions that indicate an existing release, a past release, or a material threat of a release of any hazardous substances or petroleum products into structures on the property or into the ground, groundwater, or surface water of the property. If RECs are identified, then a Phase II ESA is generally recommended, which includes the collection of soil, soil vapor, and groundwater samples, as necessary, to identify the extent of contamination and need for cleanup to reduce exposure potential to the public.

To provide for adequate disclosure of impacts, and to identify any necessary mitigation, a Phase I ESA is necessary for inclusion in an EIR to evaluate the potential for RECs at the Project site. If a REC is identified, a Phase II should be conducted to sample for potential contaminants. Any contamination that is identified above regulatory screening levels, including those established by the California Department of Toxics Substances Control[2], should be further evaluated and cleaned up, if necessary, in coordination with the Regional Water Quality Control Board and the California Department of Toxics Substances Control.

Air Quality

Unsubstantiated Input Parameters Used to Estimate Project Emissions

The IS/MND's air quality analysis relies on emissions calculated with California Emissions Estimator Model ("CalEEMod") Version 2020.4.0 (p. 4.3-6).[3] 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.

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[1] http://www.astm.org/Standards/E1527.htm

[2] https://dtsc.ca.gov/wp-content/uploads/sites/31/2022/02/HHRA-Note-3-June2020-Revised-May2022A.pdf

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

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.

When reviewing the Project's CalEEMod output files, provided in the Air Quality and Greenhouse Gas Emissions Study ("AQ & GHG Study") as Appendix B to the IS/MND, we found that several model inputs were not consistent with information disclosed in the IS/MND. As a result, the Project's construction and operational emissions may be 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.

Failure to Consider Potential Cold Storage Requirements

Review of the CalEEMod output files demonstrates that the "Summit Avenue Warehouse" model includes the entirety of the proposed warehouse land use space as "Unrefrigerated Warehouse-No Rail" (see excerpt below) (Appendix B, pp. 50, 76, 102).

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area
Unrefrigerated Warehouse-No Rail	102.38	1000sqft	4.49	102,380.00

As demonstrated in the excerpt above, the model fails to include any refrigerated warehouse space. However, this is incorrect, as the IS/MND indicates that the future tenants of the proposed warehouse are currently unknown (p. 3-13). Thus, future tenants may require cold storage. Therefore, as refrigerated warehouse space is the most energy-intensive, the Project should have included all of the proposed warehouse space as cold storage in order to conduct the most conservative analysis.

This presents an issue, as refrigerated warehouses release more criteria air pollutant and GHG emissions when compared to manufacturing land uses for three reasons. First, warehouses equipped with cold storage, such as refrigerators and freezers, are known to consume more energy when compared to warehouses without cold storage.[4] Second, warehouses equipped with cold storage typically require refrigerated trucks, which are known to idle for much longer when compared to unrefrigerated hauling trucks.[5] Lastly, according to a July 2014 *Warehouse Truck Trip Study Data Results and Usage* presentation prepared by the South Coast Air Quality Management District ("SCAQMD"), hauling trucks that require refrigeration result in greater truck trip rates when compared to non-refrigerated hauling trucks.[6] Furthermore, as discussed by SCAQMD, "CEQA requires the use of 'conservative analysis' to

[4] "Warehouses." Business Energy Advisor, *available at*: https://ouc.bizenergyadvisor.com/article/warehouses.
[5] "Estimation of Fuel Use by Idling Commercial Trucks." Transportation Research Record Journal of the Transportation Research Board, January 2006, p. 8, *available at:* https://www.researchgate.net/publication/245561735_Estimation_of_Fuel_Use_by_Idling_Commercial_Trucks.
[6] "Warehouse Truck Trip Study Data Results and Usage" Presentation. SCAQMD Mobile Source Committee, July 2014, *available at:* http://www.aqmd.gov/docs/default-source/ceqa/handbook/high-cube-warehouse-trip-rate-study-for-air-quality-analysis/finaltrucktripstudymsc072514.pdf?sfvrsn=2, p. 7, 9.

afford 'fullest possible protection of the environment.'"[7] As such, the model should have included the warehouse land use as refrigerated in order account for the additional emissions that refrigeration requirements may generate.

By failing to account for potential cold storage requirements, the model may underestimate the Project's operational emissions and should not be relied upon to determine Project significance. An EIR should be prepared to account for the possibility of refrigerated warehouse needs by all future tenants.

Failure to Model All Proposed Land Uses

According to the IS/MND:

> "The proposed project would construct a 102,380-square-foot warehouse facility, which would include 10,000 square feet of office space (5,000 square feet on the first floor and 5,000 square feet mezzanine and 92,380 square feet of warehouse space). The warehouse would have 11 dock doors, three trailer stalls, and 53 automobile parking stalls" (p. 1-1).

As such, the model should have included 10,000-SF of office space and 56 parking spaces.[8] However, review of the CalEEMod output files demonstrates that the "Summit Avenue Warehouse" model includes all 102,380-SF as "Unrefrigerated Warehouse-No Rail" (see excerpt below) (Appendix B, pp. 50, 76, 102).

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area
Unrefrigerated Warehouse-No Rail	102.38	1000sqft	4.49	102,380.00

As you can see in the excerpt above, the model fails to distinguish between the proposed warehouse and office space. Furthermore, the model fails to include the proposed parking land use whatsoever. These inconsistencies present an issue, as CalEEMod includes 63 different land use types that are each assigned a distinctive set of energy usage emission factors.[9] The square footage of parking land uses is also used for certain calculations such as determining the area to be painted and stripped (i.e., VOC emissions from architectural coatings), volume to be ventilated, and area to include lighting (i.e., energy impacts).[10] Thus, by failing to include all proposed land use types, the model may underestimate the Project's construction-related and operational emissions and should not be relied upon to determine Project significance.

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[7] "Warehouse Truck Trip Study Data Results and Usage" Presentation. SCAQMD Inland Empire Logistics Council, June 2014, *available at*: http://www.aqmd.gov/docs/default-source/ceqa/handbook/high-cube-warehouse-trip-rate-study-for-air-quality-analysis/final-ielc_6-19-2014.pdf?sfvrsn=2.
[8] Calculated: 53 automobile spaces + 3 trailer stalls = 56 parking spaces.
[9] "Appendix D – Default Data Tables" California Air Pollution Control Officers Association (CAPCOA), June 2021, *available at:* https://www.aqmd.gov/caleemod/user's-guide, p. D-305.
[10] "CalEEMod User's Guide." California Air Pollution Control Officers Association (CAPCOA), May 2021, *available at:* https://www.aqmd.gov/caleemod/user's-guide, p. 29.

Unsubstantiated Reductions to Architectural Coating Emission Factor

Review of the CalEEMod output files demonstrates that the "Summit Avenue Warehouse" model includes two reductions to the default architectural coating emission factors (see excerpt below) (Appendix B, pp. 51, 77, 103).

Table Name	Column Name	Default Value	New Value
tblArchitecturalCoating	EF_Nonresidential_Exterior	100.00	50.00
tblArchitecturalCoating	EF_Nonresidential_Interior	100.00	50.00

As you can see in the excerpt above, the nonresidential exterior and interior architectural coating emission factors are reduced from the default value of 100- to 50-grams per liter ("g/L"). As previously mentioned, the CalEEMod User's Guide requires any changes to model defaults be justified.[11] According to the "User Entered Comments & Non-Default Data" table, the justification provided for these changes is:

> "Per SCAQMD Rule 1113" (Appendix B, pp. 50, 76, 102).

However, these changes remain unsupported for two reasons.

First, the IS/MND and associated documents fail to mention South Coast Air Quality Management District ("SCAQMD") Rule 1113 or justify the revised architectural coating emission factors whatsoever. As such, the reductions remain unsubstantiated.

Second, we cannot verify the accuracy of the revised architectural coating emission factors based on SCAQMD Rule 1113 alone. The SCAQMD Rule 1113 Table of Standards provides the required VOC limits (grams of VOC per liter of coating) for 57 different coating categories.[12] The VOC limits for each coating varies from a minimum value of 50 g/L to a maximum value of 730 g/L. As such, we cannot verify that SCAQMD Rule 1113 substantiates reductions to the default coating values without more information regarding what category of coating will be used. As the IS/MND and associated documents fail to explicitly require the use of a specific type of coating, we are unable to verify the revised emission factors assumed in the model.

These unsubstantiated reductions present an issue, as CalEEMod uses the architectural coating emission factors to calculate the Project's reactive organic gas/volatile organic compound ("ROG"/"VOC") emissions.[13] Thus, by including unsubstantiated reductions to the default architectural coating emission factors, the model may underestimate the Project's construction-related ROG/VOC emissions and should not be relied upon to determine Project significance.

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[11] "CalEEMod User's Guide." California Air Pollution Control Officers Association (CAPCOA), May 2021, *available at:* https://www.aqmd.gov/caleemod/user's-guide, p. 1, 14.
[12] SCAQMD Rule 1113 Advisory Notice." SCAQMD, February 2016, *available at:* http://www.aqmd.gov/docs/default-source/rule-book/reg-xi/r1113.pdf?sfvrsn=24, p. 1113-14, Table of Standards 1.
[13] "CalEEMod User's Guide." California Air Pollution Control Officers Association (CAPCOA), May 2021, *available at:* https://www.aqmd.gov/caleemod/user's-guide, p. 35, 40.

Failure to Substantiate Amount of Material Import or Export

According to the CalEEMod User's Guide:

> "Grading involves the cut and fill of land to ensure that the proper base and slope is created for the foundation." [14]

As demonstrated above, grading involves the use of material import (fill) and export (cut). According to the IS/MND:

> "Construction activities would include ***earthwork***, rebar, structural steel, concrete slab, concrete panels, truss placement, mechanical, electrical, plumbing, glazing, roofing, landscaping, hardscape consisting of asphalt concrete, fencing, associated site utilities, site drainage, and any associated offsite work that may be required […]
>
> The type of construction equipment utilized during construction is anticipated to include:
> - Tractors, loaders, backhoes, dozers, excavators, skip loaders, scrapers, concrete trucks, concrete pumps, concrete vibrators, laser screeds, and dump trucks for site preparation and ***rough grading***" (emphasis added) (p. 3-16).

As demonstrated above, the proposed Project site requires earthwork and grading. However, the IS/MND fails to discuss the amount of material import or export required for Project construction whatsoever. Furthermore, review of the CalEEMod output files demonstrates that the "Summit Avenue Warehouse" model fails to include any amount of material import or export. As such, the model may underestimate the amount of material import and export required during Project construction.

This potential underestimation presents an issue, as the inclusion of material import and export within the model is necessary to calculate emissions produced from material movement, which includes truck loading and unloading, as well as additional hauling truck trips.[15] As the IS/MND fails to substantiate any amount of material import or export, the model may underestimate the Project's construction-related emissions and should not be relied upon to determine Project significance. An EIR should be prepared to verify the amount of required material import and export and revise the model, if necessary.

Unsubstantiated Changes to Off-Road Construction Equipment Unit Amounts and Usage Hours

Review of the CalEEMod output files demonstrates that the "Summit Avenue Warehouse" model includes several changes to the default off-road construction equipment unit amounts and usage hours (see excerpt below) (Appendix B, pp. 50, 76, 102).

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[14] "CalEEMod User's Guide." California Air Pollution Control Officers Association (CAPCOA), May 2021, *available at:* https://www.aqmd.gov/caleemod/user's-guide, p. 32.
[15] "CalEEMod User's Guide." California Air Pollution Control Officers Association (CAPCOA), May 2021, *available at:* https://www.aqmd.gov/caleemod/user's-guide, p. 34.

Table Name	Column Name	Default Value	New Value
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	3.00
tblOffRoadEquipment	UsageHours	6.00	8.00
tblOffRoadEquipment	UsageHours	7.00	8.00
tblOffRoadEquipment	UsageHours	8.00	7.00
tblOffRoadEquipment	UsageHours	6.00	8.00
tblOffRoadEquipment	UsageHours	6.00	8.00
tblOffRoadEquipment	UsageHours	7.00	6.00
tblOffRoadEquipment	UsageHours	8.00	7.00
tblOffRoadEquipment	UsageHours	8.00	7.00

As previously mentioned, the CalEEMod User's Guide requires any changes to model defaults be justified.[16] According to the "User Entered Comments and Non-Default Data" table, the justification provided for these changes is:

> "Per client" (Appendix B, pp. 50, 76, 102).

Furthermore, the IS/MND states:

> "The type of construction equipment utilized during construction is anticipated to include:
>
> - Tractors, loaders, backhoes, dozers, excavators, skip loaders, scrapers, concrete trucks, concrete pumps, concrete vibrators, laser screeds, and dump trucks for site preparation and rough grading.
> - Cranes, forklifts, backhoes, skip loaders, trucking, compacting equipment, manlifts, welders, paving-skip loaders, grading equipment, trucking and rollers for building construction.
> - Skip loaders, backhoes, trenchers and trucking for utility improvements.
> - Bobcats, air compressors, forklifts, and delivery trucks for landscaping and irrigation" (p. 3-16).

However, these changes remain unsupported for two reasons.

First, the IS/MND and associated documents fail to provide the specific off-road construction equipment unit amounts or usage hours. This is incorrect, as according to the CalEEMod User's Guide:

[16] "CalEEMod User's Guide." California Air Pollution Control Officers Association (CAPCOA), May 2021, *available at:* https://www.aqmd.gov/caleemod/user's-guide, p. 1, 14.

> "CalEEMod was also designed to allow the user to change the defaults to reflect site- or project-specific information, when available, provided that the information is supported by substantial evidence as required by CEQA." [17]

As such, until additional information becomes available that substantiates the revised unit amounts and usage hours, we are unable to verify that the changes included in the model are an accurate reflection of the proposed construction equipment.

Second, some of the above-mentioned equipment types are not included in the model, such as concrete trucks and pumps for site preparation and rough grading as well as compacting equipment for building construction. As such, the amount of construction equipment is underestimated in the model.

These unsubstantiated changes present an issue, as CalEEMod uses the off-road equipment input parameters to calculate the emissions associated with off-road construction equipment.[18] By including unsubstantiated changes to the default off-road construction equipment unit amounts and usage hours, the model may underestimate the Project's construction-related emissions and should not be relied upon to determine Project significance.

Underestimated Number of Operational Daily Vehicle Trips

According to the IS/MND, the Project is expected to generate 178 daily vehicle trips (p. 4.17-3). As such, the model should have included trips rates that accurately reflect the expected number of vehicle trips. However, review of the CalEEMod output files demonstrates that the "Summit Avenue Warehouse" model includes only 137 daily operational vehicle trips (see excerpt below) (Appendix B, pp. 70, 96, 122).

	Average Daily Trip Rate		
Land Use	Weekday	Saturday	Sunday
Unrefrigerated Warehouse-No Rail	137.19	137.19	137.19
Total	137.19	137.19	137.19

Thus, the number of daily operational vehicle trips is underestimated by approximately 41 trips.[19] As such, the trip rates inputted into the model are underestimated and inconsistent with the information provided by the IS/MND.

These inconsistencies present an issue, as CalEEMod uses the operational vehicle trip rates to calculate the emissions associated with the operational on-road vehicles.[20] Thus, by including an underestimated

[17] "CalEEMod User's Guide." California Air Pollution Control Officers Association (CAPCOA), May 2021, *available at:* https://www.aqmd.gov/caleemod/user's-guide, p. 13-14.
[18] "CalEEMod User's Guide." California Air Pollution Control Officers Association (CAPCOA), May 2021, *available at:* https://www.aqmd.gov/caleemod/user's-guide, p. 33-34.
[19] Calculated: (178 proposed daily vehicle trips) - (137 modeled daily vehicle trips) = 41 underestimated daily vehicle trips.
[20] "CalEEMod User's Guide." California Air Pollution Control Officers Association (CAPCOA), May 2021, *available at:* https://www.aqmd.gov/caleemod/user's-guide, p. 35.

number of daily operational vehicle trips, the model underestimates the Project's mobile-source emissions and should not be relied upon to determine Project significance.

Updated Analysis Indicates a Potentially Significant Air Quality Impact

In an effort to more accurately estimate the Project's construction-related and operational emissions, we prepared an updated CalEEMod model, using the Project-specific information provided by the IS/MND. In our updated model, we included all of the proposed land uses; omitted the unsubstantiated changes to the architectural coating emission factors and off-road construction equipment unit amounts and usage hours; and included the correct number of operational daily vehicle trips.[21]

Our updated analysis estimates that the Project's construction-related ROG emissions exceed the applicable SCAQMD threshold of 75-lbs/day, respectively, as referenced by the IS/MND (p. 4.3-17, Table 4.3-5) (see table below).[22]

SWAPE Criteria Air Pollutant Emissions	
Construction	**ROG** (lbs/day)
IS/MND	47.67
SWAPE	95.76
% Increase	101%
SCAQMD Threshold	**75**
Exceeds?	***Yes***

As demonstrated above, the Project's construction-related ROG emissions, as estimated by SWAPE, increase by approximately 101%, and exceed the applicable SCAQMD significance threshold. Thus, our updated model demonstrates that the Project would result in a potentially significant air quality impact that was not previously identified or addressed in the IS/MND. As a result, an EIR should be prepared to adequately assess and mitigate the potential air quality impacts that the Project may have on the environment.

Disproportionate Health Risk Impacts of Warehouses on Surrounding Communities

Upon review of the IS/MND, we have determined that the development of the proposed Project would result in disproportionate health risk impacts on community members living, working, and going to school within the immediate area of the Project site. According to the SCAQMD:

[21] See Attachment A for updated air modeling.
[22] "South Coast AQMD Air Quality Significance Thresholds." SCAQMD, April 2019, *available at*: http://www.aqmd.gov/docs/default-source/ceqa/handbook/scaqmd-air-quality-significance-thresholds.pdf.

> "Those living within a half mile of warehouses are more likely to include communities of color, have health impacts such as higher rates of asthma and heart attacks, and a greater environmental burden."[23]

In particular, the SCAQMD found that more than 2.4 million people live within a half mile radius of at least one warehouse, and that those areas not only experience increased rates of asthma and heart attacks, but are also disproportionately Black and Latino communities below the poverty line.[24] Another study similarly indicates that "neighborhoods with lower household income levels and higher percentages of minorities are expected to have higher probabilities of containing warehousing facilities."[25] Additionally, a report authored by the Inland Empire-based People's Collective for Environmental Justice and University of Redlands states:

> "As the warehouse and logistics industry continues to grow and net exponential profits at record rates, more warehouse projects are being approved and constructed in low-income communities of color and serving as a massive source of pollution by attracting thousands of polluting truck trips daily. Diesel trucks emit dangerous levels of nitrogen oxide and particulate matter that cause devastating health impacts including asthma, chronic obstructive pulmonary disease (COPD), cancer, and premature death. As a result, physicians consider these pollution-burdened areas 'diesel death zones."[26]

It is evident that the continued development of industrial warehouses within these communities poses a significant environmental justice challenge. However, the acceleration of warehouse development is only increasing despite the consequences on public health. The Inland Empire alone is adding 10 to 25 million SF of new industrial space each year.[27] San Bernardino County, the setting of the proposed Project, has long borne a disproportionately high pollution burden compared to the rest of California. When using CalEnviroScreen 4.0, CalEPA's screening tool that ranks each census tract in the State for

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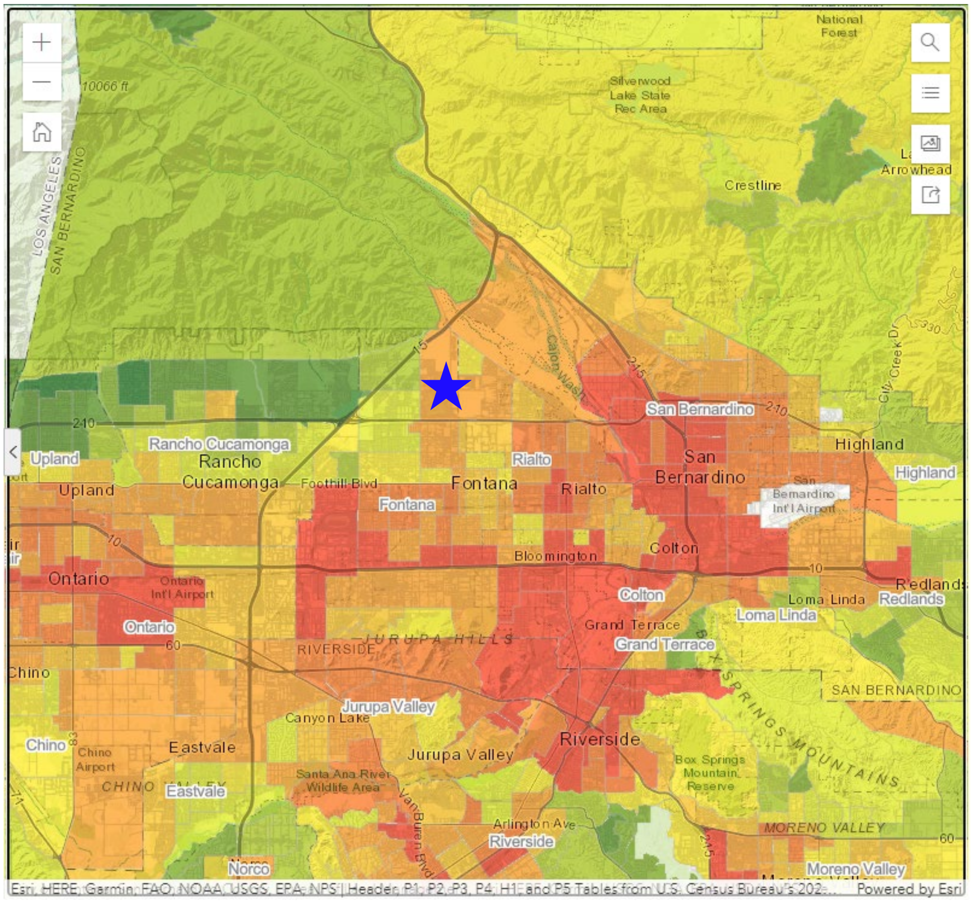
[23] "South Coast AQMD Governing Board Adopts Warehouse Indirect Source Rule." SCAQMD, May 2021, *available at:* http://www.aqmd.gov/docs/default-source/news-archive/2021/board-adopts-waisr-may7-2021.pdf?sfvrsn=9.
[24] "Southern California warehouse boom a huge source of pollution. Regulators are fighting back." Los Angeles Times, May 2021, *available at:* https://www.latimes.com/california/story/2021-05-05/air-quality-officials-target-warehouses-bid-to-curb-health-damaging-truck-pollution.
[25] "Location of warehouses and environmental justice: Evidence from four metros in California." Metro Freight Center of Excellence, January 2018, *available at:* https://www.metrans.org/assets/research/MF%201.1g_Location%20of%20warehouses%20and%20environmental%20justice_Final%20Report_021618.pdf, p. 21.
[26] "Warehouses, Pollution, and Social Disparities: An analytical view of the logistics industry's impacts on environmental justice communities across Southern California." People's Collective for Environmental Justice, April 2021, *available at:* https://earthjustice.org/sites/default/files/files/warehouse_research_report_4.15.2021.pdf, p. 4.
[27] "2020 North America Industrial Big Box Review & Outlook." CBRE, 2020, *available at:* https://www.cbre.com/-/media/project/cbre/shared-site/insights/local-responses/industrial-big-box-report-inland-empire/local-response-2020-ibb-inland-empire-overview.pdf, p. 2.

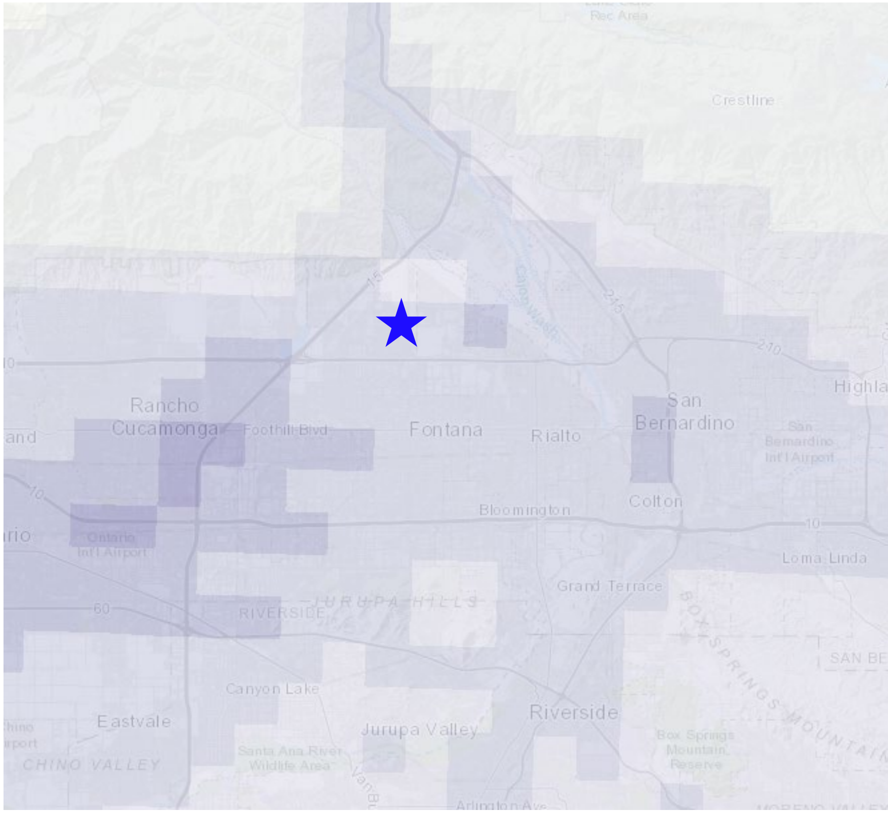
pollution and socioeconomic vulnerability, we found that the Project's census tract is in the 80th percentile of most polluted census tracts in the State (see excerpt below).[28]



Furthermore, the Data Visualization Tool for Mates V, a monitoring and evaluation study conducted by SCAQMD, demonstrates that the City already exhibits a heightened residential carcinogenic risk from exposure to air toxics (see excerpt below).[29]

[28] "CalEnviroScreen 4.0." California Office of Environmental Health Hazard Assessment (OEHHA), October 2021, *available at:* https://oehha.ca.gov/calenviroscreen/report/calenviroscreen-40.

[29] "Residential Air Toxics Cancer Risk Calculated from Model Data in Grid Cells." MATES V, 2018, *available at:* https://experience.arcgis.com/experience/79d3b6304912414bb21ebdde80100b23/page/Main-Page/?views=Click-tabs-for-other-data%2CGridded-Cancer-Risk; see also: "MATES V Multiple Air Toxics Exposure Study." SCAQMD, *available at:* http://www.aqmd.gov/home/air-quality/air-quality-studies/health-studies/mates-v.



Therefore, development of the proposed warehouse would disproportionately contribute to and exacerbate the health conditions of the residents in Fontana.

In April 2022, the American Lung Association ranked San Bernadino County as the worst for ozone pollution in the nation.[30] The Los Angeles Times also reported that San Bernardino County had 130 bad air days for ozone pollution in 2020, violating federal health standards on nearly every summer day.[31] Downtown Los Angeles, by comparison, had 22 ozone violation days in 2020. This year, the County continues to face the worst ozone pollution, as it has seen the highest recorded Air Quality Index ("AQI") values for ground-level ozone in California.[32] The U.S. Environmental Protection Agency ("EPA") indicates that ozone, the main ingredient in "smog," can cause several health problems, which includes aggravating lung diseases and increasing the frequency of asthma attacks. The U.S. EPA states:

[30] "State of the Air 2022." American Lung Association, April 2022, *available at:* https://www.lung.org/research/sota/key-findings/most-polluted-places.

[31] "Southern California warehouse boom a huge source of pollution. Regulators are fighting back." Los Angeles Times, May 2021, *available at:* https://www.latimes.com/california/story/2021-05-05/air-quality-officials-target-warehouses-bid-to-curb-health-damaging-truck-pollution.

[32] "High Ozone Days." American Lung Association, 2022, *available at:* https://www.lung.org/research/sota/city-rankings/states/california.

> "Children are at greatest risk from exposure to ozone because their lungs are still developing and they are more likely to be active outdoors when ozone levels are high, which increases their exposure. Children are also more likely than adults to have asthma."[33]

Furthermore, regarding the increased sensitivity of early-life exposures to inhaled pollutants, the California Air Resources Board ("CARB") states:

> "Children are often at greater risk from inhaled pollutants, due to the following reasons:
>
> - Children have unique activity patterns and behavior. For example, they crawl and play on the ground, amidst dirt and dust that may carry a wide variety of toxicants. They often put their hands, toys, and other items into their mouths, ingesting harmful substances. Compared to adults, children typically spend more time outdoors and are more physically active. Time outdoors coupled with faster breathing during exercise increases children's relative exposure to air pollution.
>
> - Children are physiologically unique. Relative to body size, children eat, breathe, and drink more than adults, and their natural biological defenses are less developed. The protective barrier surrounding the brain is not fully developed, and children's nasal passages aren't as effective at filtering out pollutants. Developing lungs, immune, and metabolic systems are also at risk.
>
> - Children are particularly susceptible during development. Environmental exposures during fetal development, the first few years of life, and puberty have the greatest potential to influence later growth and development."[34]

A Stanford-led study also reveals that children exposed to high levels of air pollution are more susceptible to respiratory and cardiovascular diseases in adulthood.[35] Thus, given children's higher propensity to succumb to the negative health impacts of air pollutants, and as warehouses release more smog-forming pollution than any other sector, it is necessary to evaluate the specific health risk that warehouses pose to children in the nearby community.

According to the above-mentioned study by the People's Collective for Environmental Justice and University of Redlands, there are 640 schools in the South Coast Air Basin that are located within half a mile of a large warehouse, most of them in socio-economically disadvantaged areas.[36] Regarding the proposed Project itself, the IS/MND states:

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[33] "Health Effects of Ozone Pollution." U.S. EPA, May 2021, *available at:* https://www.epa.gov/ground-level-ozone-pollution/health-effects-ozone-pollution.

[34] "Children and Air Pollution." California Air Resources Board (CARB), *available at:* https://ww2.arb.ca.gov/resources/documents/children-and-air-pollution.

[35] "Air pollution puts children at higher risk of disease in adulthood, according to Stanford researchers and others." Stanford, February 2021, *available at:* https://news.stanford.edu/2021/02/22/air-pollution-impacts-childrens-health/.

[36] "Warehouses, Pollution, and Social Disparities: An analytical view of the logistics industry's impacts

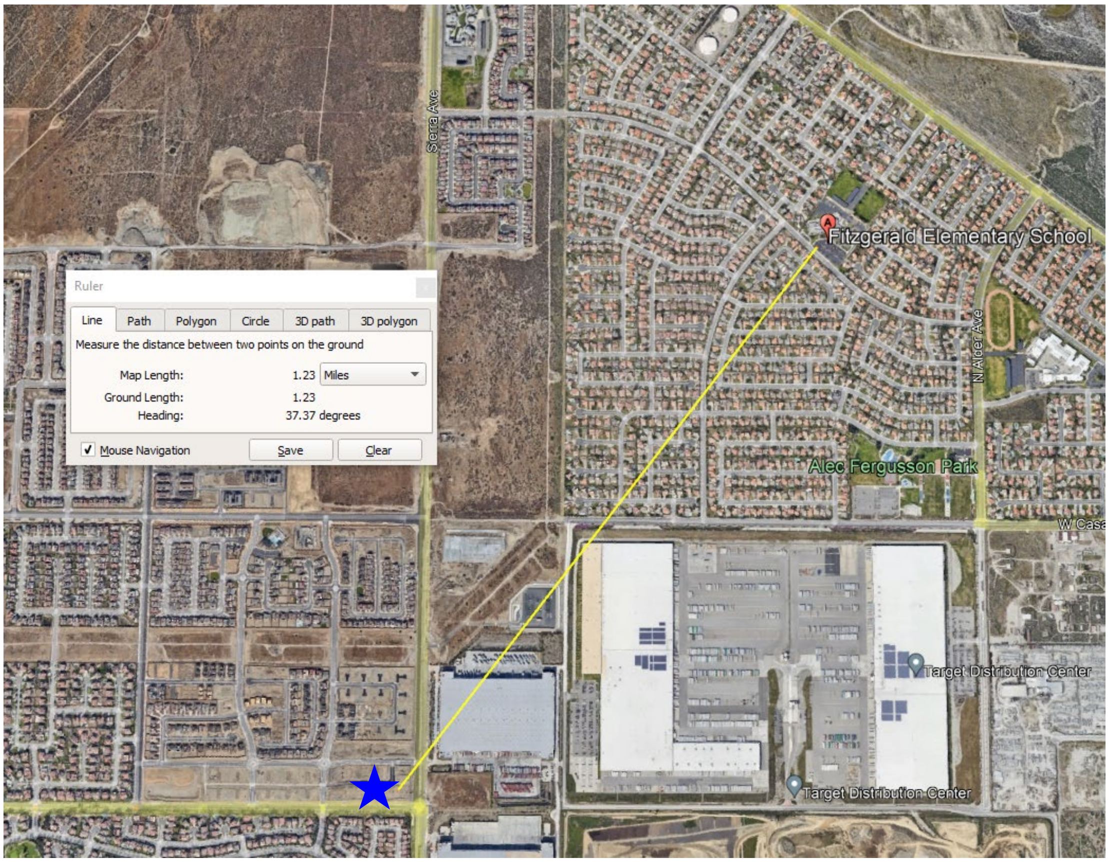
"The residences to the west of the project site, across Sierra Avenue are the nearest sensitive receptors, about 162 feet (49 meters) away" (p. 4.3-9).

Furthermore, the IS/MND states:

"The closest school to the project site is Sierra Lakes Elementary School, located at 5740 Avenal Place, approximately 0.90 mile southwest of the project site (Google Earth Pro, 2021)" (p. 4.9-5).

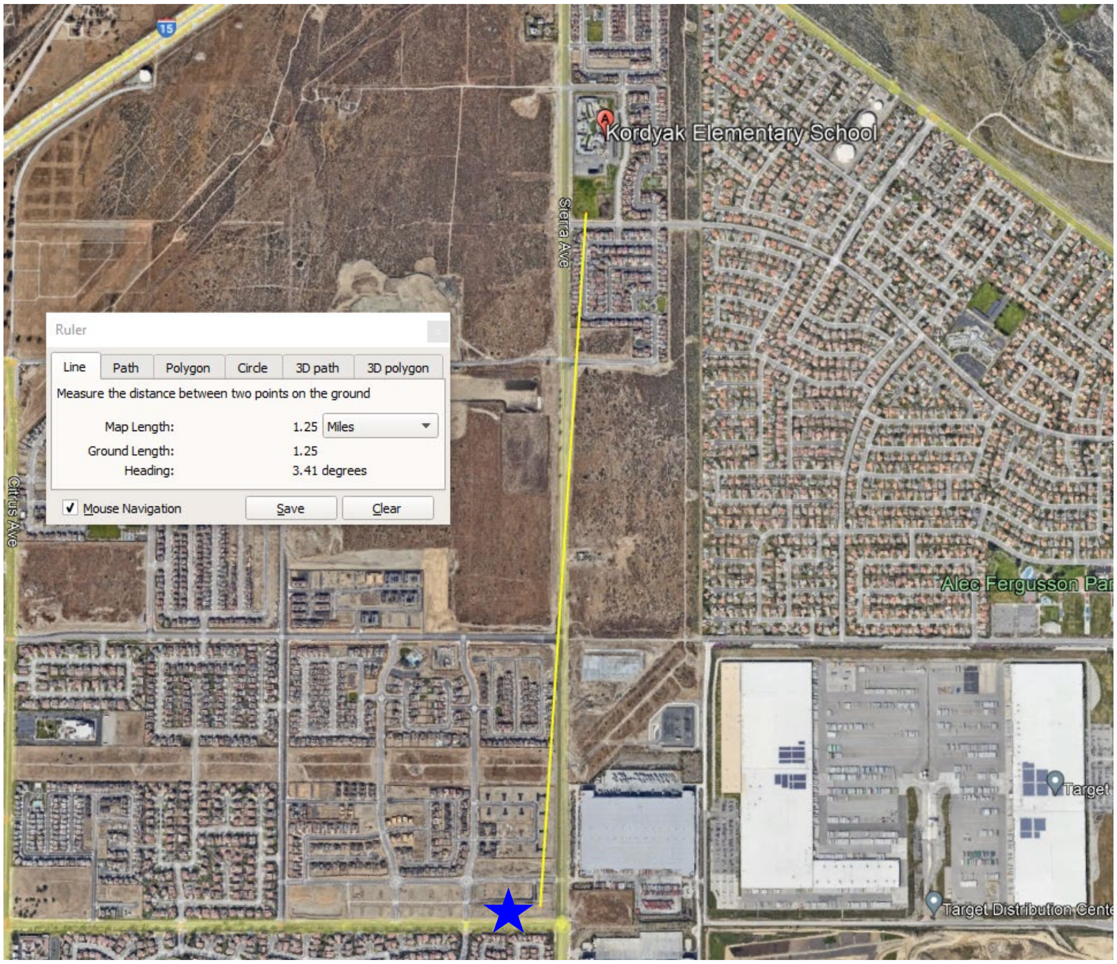
Finally, review of Google Earth demonstrates that the Project site is approximately 1.23- and 1.25-miles from the Fitzgerald Elementary School and Kordyak Elementary School, respectively (see excerpts below).

Fitzgerald Elementary School



on environmental justice communities across Southern California." People's Collective for Environmental Justice, April 2021, *available at:* https://earthjustice.org/sites/default/files/files/warehouse_research_report_4.15.2021.pdf, p. 4.

Kordyak Elementary School



This poses a significant threat because, as outlined above, children are a vulnerable population that are more susceptible to the damaging side effects of air pollution. As such, the Project would have detrimental short-term and long-term health impacts on local residents and children if approved.

An EIR should be prepared to evaluate the disproportionate impacts of the proposed warehouse on the community adjacent to the Project, including an analysis of the impact on children and people of color who live and attend school in the surrounding area. Finally, in order to evaluate the cumulative air quality impact from the several warehouse projects proposed or built in a one-mile radius of the Project site, the EIR should prepare a cumulative health risk assessment ("HRA") to quantify the adverse health outcome from the effects of exposure to multiple warehouses in the immediate area in conjunction with the poor ambient air quality in the Project's census tract.

Diesel Particulate Matter Health Risk Emissions Inadequately Evaluated

The IS/MND concludes that the proposed Project would result in a less-than-significant health risk impact based on a quantified construction and operational screening health risk assessment ("HRA") using the U.S. EPA's SCREEN3 model. Specifically, the Screening Level Health Risk Assessment ("HRA Report"), provided as Appendix H to the IS/MND, estimates that the maximum incremental cancer risk posed to nearby, existing residential sensitive receptors associated with exposure to diesel particulate matter ("DPM") emissions during Project construction and operation would be 0.39 and 6.9 in one million, respectively, which would not exceed the SCAQMD significance threshold of 10 in one million (see excerpt below) (p. 7, Table 4.2-1).

Table 4.2-1
MAXIMUM INDIVIDUAL CANCER RISK RESULTS

Project Phase	Maximum Individual Cancer Risk (per million)	SCAQMD CEQA Significance Threshold (per million)
Construction	0.39	10
Operations	6.9	10

However, the IS/MND's evaluation of the Project's potential health risk impacts, as well as the subsequent less-than-significant impact conclusion, is incorrect for three reasons.

First, the IS/MND's construction and operational HRAs utilize the outdated SCREEN3 model. AERSCREEN, a screening level air quality dispersion model, replaced SCREEN3. The U.S. EPA states in an April 2011 Memorandum titled *AERSCREEN Released as the EPA Recommended Screening Model*:

> "The recommended simple terrain screening model in The Guideline on Air Quality Models (Guideline, published as Appendix W to 40 CFR Part 51) has been SCREEN3. However, AERSCREEN (the single source screening version of AERMOD) is now available as a full release or non-beta version. This memorandum clarifies the replacement of SCREEN3 with AERSCREEN as the recommended screening model."[37]

Furthermore, the current U.S. EPA website states that "AERSCREEN is the recommended screening model based on AERMOD."[38] As such, the IS/MND's HRAs rely on an outdated screening model and should not be relied upon to determine Project significance.

Second, the IS/MND's construction HRA is incorrect, as it relies upon a PM_{10} estimate from a flawed air model. Specifically, the IS/MND states:

> "Results from the CalEEMod analysis describe above was used to calculate time-weighted average diesel particulate matter (DPM) emissions" (p. 4.3-9).

As previously discussed, when we reviewed the Project's CalEEMod output files, provided in the AQ & GHG Study as Appendix B to the IS/MND, we found that several of the values inputted into the model are not consistent with information disclosed in the IS/MND. Thus, the HRA utilizes an underestimated diesel particulate matter ("DPM") concentration to calculate the health risk associated with Project

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[37] "AERSCREEN Released as the EPA Recommended Screening Model." United States Environmental Protection Agency (EPA), April 2011, *available at:* https://www.epa.gov/sites/default/files/2020-10/documents/20110411_aerscreen_release_memo.pdf.
[38] "Air Quality Dispersion Modeling - Screening Models." United States Environmental Protection Agency (EPA), June 2022, *available at:* https://www.epa.gov/scram/air-quality-dispersion-modeling-screening-models

construction. As such, the IS/MND's construction HRA and resulting cancer risk should not be relied upon to determine Project significance.

Third, while the IS/MND includes two HRAs evaluating the health risk impacts to nearby, existing receptors as a result of Project construction and operation, the IS/MND fails to evaluate the combined lifetime cancer risk to nearby receptors as a result of Project construction and operation together. According to OEHHA guidance, "the excess cancer risk is calculated separately for each age grouping and then summed to yield cancer risk at the receptor location." [39] However, the IS/MND fails to sum the total cancer risks in order to evaluate the combined cancer risk over the course of the Project's total construction and operation. This is incorrect and, as such, an updated analysis should quantify and sum the Project's construction and operational health risks to compare to the SCAQMD threshold of 10 in one million, as referenced by the IS/MND (p. 4.3-9, 4.3-10).

Screening-Level Analysis Demonstrates Significant Impacts

In order to conduct our screening-level risk assessment we relied upon AERSCREEN, which is a screening level air quality dispersion model.[40] As discussed above, the model replaced SCREEN3, and AERSCREEN is included in the OEHHA and the California Air Pollution Control Officers Associated ("CAPCOA") guidance as the appropriate air dispersion model for Level 2 health risk screening assessments ("HRSAs").[41, 42] A Level 2 HRSA utilizes a limited amount of site-specific information to generate maximum reasonable downwind concentrations of air contaminants to which nearby sensitive receptors may be exposed. If an unacceptable air quality hazard is determined to be possible using AERSCREEN, a more refined modeling approach is required prior to approval of the Project.

We prepared a preliminary HRA of the Project's construction and operational health risk impact to residential sensitive receptors using the annual PM_{10} exhaust estimates from the IS/MND's CalEEMod output files. Consistent with recommendations set forth by OEHHA, we assumed residential exposure begins during the third trimester stage of life.[43] The IS/MND's CalEEMod model indicates that construction activities will generate approximately 49 pounds of DPM over the 236-day construction period.[44] The AERSCREEN model relies on a continuous average emission rate to simulate maximum downward concentrations from point, area, and volume emission sources. To account for the variability in equipment usage and truck trips over Project construction, we calculated an average DPM emission rate by the following equation:

[39] "Guidance Manual for preparation of Health Risk Assessments." OEHHA, February 2015, *available at:* https://oehha.ca.gov/media/downloads/crnr/2015guidancemanual.pdf p. 8-4
[40] "AERSCREEN Released as the EPA Recommended Screening Model," U.S. EPA, April 2011, *available at:* http://www.epa.gov/ttn/scram/guidance/clarification/20110411_AERSCREEN_Release_Memo.pdf
[41] "Risk Assessment Guidelines: Guidance Manual for Preparation of Health Risk Assessments." OEHHA, February 2015, *available at:* https://oehha.ca.gov/media/downloads/crnr/2015guidancemanual.pdf.
[42] "Health Risk Assessments for Proposed Land Use Projects." CAPCOA, July 2009, *available at:* http://www.capcoa.org/wp-content/uploads/2012/03/CAPCOA_HRA_LU_Guidelines_8-6-09.pdf.
[43] "Risk Assessment Guidelines: Guidance Manual for Preparation of Health Risk Assessments." OEHHA, February 2015, *available at:* https://oehha.ca.gov/media/downloads/crnr/2015guidancemanual.pdf, p. 8-18.
[44] See Attachment B for health risk calculations.

$$Emission\ Rate\ \left(\frac{grams}{second}\right) = \frac{49.4\ lbs}{236\ days} \times \frac{453.6\ grams}{lbs} \times \frac{1\ day}{24\ hours} \times \frac{1\ hour}{3{,}600\ seconds} = \mathbf{0.00110\ g/s}$$

Using this equation, we estimated a construction emission rate of 0.00110 grams per second ("g/s"). Subtracting the 236-day construction period from the total residential duration of 30 years, we assumed that after Project construction, the sensitive receptor would be exposed to the Project's operational DPM for an additional 29.35 years. The IS/MND's operational CalEEMod emissions indicate that operational activities will generate approximately 6 net pounds of DPM per year throughout operation. Applying the same equation used to estimate the construction DPM rate, we estimated the following emission rate for Project operation:

$$Emission\ Rate\ \left(\frac{grams}{second}\right) = \frac{6.0\ lbs}{365\ days} \times \frac{453.6\ grams}{lbs} \times \frac{1\ day}{24\ hours} \times \frac{1\ hour}{3{,}600\ seconds} = \mathbf{0.0000869\ g/s}$$

Using this equation, we estimated an operational emission rate of 0.0000869 g/s. Construction and operation were simulated as a 4.49-acre rectangular area source in AERSCREEN, with approximate dimensions of 191- by 95-meters. A release height of three meters was selected to represent the height of stacks of operational equipment and other heavy-duty vehicles, and an initial vertical dimension of one and a half meters was used to simulate instantaneous plume dispersion upon release. An urban meteorological setting was selected with model-default inputs for wind speed and direction distribution. The population of Fontana was obtained from U.S. 2020 Census data.[45]

The AERSCREEN model generates maximum reasonable estimates of single-hour DPM concentrations from the Project Site. The U.S. EPA suggests that the annualized average concentration of an air pollutant be estimated by multiplying the single-hour concentration by 10% in screening procedures.[46] According to the IS/MND the nearest sensitive receptor is a single-family residence located 162 feet, or 49 meters feet from the Project site (p. 4.3-9). However, review of the AERSCREEN output files demonstrates that the MEIR is located approximately 100 meters from the Project site. Thus, the single-hour concentration estimated by AERSCREEN for Project construction is approximately 1.929 μg/m^3 DPM at approximately 100 meters downwind. Multiplying this single-hour concentration by 10%, we get an annualized average concentration of 0.1929 μg/m^3 for Project construction at the MEIR. For Project operation, the single-hour concentration estimated by AERSCREEN is 0.1525 μg/m^3 DPM at approximately 100 meters downwind. Multiplying this single-hour concentration by 10%, we get an annualized average concentration of 0.01525 μg/m^3 for Project operation at the MEIR.

We calculated the excess cancer risk to the MEIR using applicable HRA methodologies prescribed by OEHHA, as recommended by SCAQMD.[47] Specifically, guidance from OEHHA and the California Air Resources Board ("CARB") recommends the use of a standard point estimate approach, including high-

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[45] "Fontana." U.S. Census Bureau, 2020, *available at:* https://datacommons.org/place/geoId/0624680.

[46] "Screening Procedures for Estimating the Air Quality Impact of Stationary Sources Revised." U.S. EPA, October 1992, *available at:* http://www.epa.gov/ttn/scram/guidance/guide/EPA-454R-92-019_OCR.pdf.

[47] "AB 2588 and Rule 1402 Supplemental Guidelines." SCAQMD, October 2020, *available at:* http://www.aqmd.gov/docs/default-source/planning/risk-assessment/ab-2588-supplemental-guidelines.pdf?sfvrsn=19, p. 2.

point estimate (i.e. 95th percentile) breathing rates and age sensitivity factors ("ASF") in order to account for the increased sensitivity to carcinogens during early-in-life exposure and accurately assess risk for susceptible subpopulations such as children. The residential exposure parameters, such as the daily breathing rates ("BR/BW"), exposure duration ("ED"), age sensitivity factors ("ASF"), fraction of time at home ("FAH"), and exposure frequency ("EF") utilized for the various age groups in our screening-level HRA are as follows:

Exposure Assumptions for Residential Individual Cancer Risk

Age Group	**Breathing Rate** (L/kg-day)[48]	**Age Sensitivity Factor**[49]	**Exposure Duration** (years)	**Fraction of Time at Home**[50]	**Exposure Frequency** (days/year)[51]	**Exposure Time** (hours/day)
3rd Trimester	361	10	0.25	1	350	24
Infant (0 - 2)	1090	10	2	1	350	24
Child (2 - 16)	572	3	14	1	350	24
Adult (16 - 30)	261	1	14	0.73	350	24

For the inhalation pathway, the procedure requires the incorporation of several discrete variates to effectively quantify dose for each age group. Once determined, contaminant dose is multiplied by the cancer potency factor ("CPF") in units of inverse dose expressed in milligrams per kilogram per day ($mg/kg/day^{-1}$) to derive the cancer risk estimate. Therefore, to assess exposures, we utilized the following dose algorithm:

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

where:

$Dose_{AIR}$ = dose by inhalation (mg/kg/day), per age group
C_{air} = concentration of contaminant in air (μg/m3)
EF = exposure frequency (number of days/365 days)

[48] "Supplemental Guidelines for Preparing Risk Assessments for the Air Toxics 'Hot Spots' Information and Assessment Act." SCAQMD, October 2020, available at: http://www.aqmd.gov/docs/default-source/planning/risk-assessment/ab-2588-supplemental-guidelines.pdf?sfvrsn=19, p. 19; see also "Risk Assessment Guidelines Guidance Manual for Preparation of Health Risk Assessments." OEHHA, February 2015, available at: https://oehha.ca.gov/media/downloads/crnr/2015guidancemanual.pdf.
[49] "Risk Assessment Guidelines Guidance Manual for Preparation of Health Risk Assessments." OEHHA, February 2015, available at: https://oehha.ca.gov/media/downloads/crnr/2015guidancemanual.pdf, p. 8-5 Table 8.3.
[50] "Risk Assessment Guidelines Guidance Manual for Preparation of Health Risk Assessments." OEHHA, February 2015, available at: https://oehha.ca.gov/media/downloads/crnr/2015guidancemanual.pdf, p. 5-24.
[51] "Risk Assessment Guidelines Guidance Manual for Preparation of Health Risk Assessments." OEHHA, February 2015, available at: https://oehha.ca.gov/media/downloads/crnr/2015guidancemanual.pdf, p. 5-24.

BR/BW = daily breathing rate normalized to body weight (L/kg/day)
A = inhalation absorption factor (default = 1)
CF = conversion factor (1x10-6, µg to mg, L to m3)

To calculate the overall cancer risk, we used the following equation for each appropriate age group:

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

where:

$Dose_{AIR}$ = dose by inhalation (mg/kg/day), per age group
CPF = cancer potency factor, chemical-specific $(mg/kg/day)^{-1}$
ASF = age sensitivity factor, per age group
FAH = fraction of time at home, per age group (for residential receptors only)
ED = exposure duration (years)
AT = averaging time period over which exposure duration is averaged (always 70 years)

Consistent with the 236-day construction schedule, the annualized average concentration for construction was used for the entire third trimester of pregnancy (0.25 years), and the first 0.40 years of the infantile stage of life (0 – 2 years). The annualized average concentration for operation was used for the remainder of the 30-year exposure period, which makes up the latter 1.60 years of the infantile stage of life, as well as the entire child (2 – 16) and adult (16 – 30 years) stages of life. The results of our calculations are shown in the table below.

The Maximally Exposed Individual at an Existing Residential Receptor

Age Group	**Emissions Source**	**Duration** (years)	**Concentration** (ug/m3)	**Cancer Risk**
3rd Trimester	Construction	0.25	0.1929	2.62E-06
	Construction	*0.40*	*0.1929*	*1.26E-05*
	Operation	*1.60*	*0.01525*	*4.02E-06*
Infant (0 - 2)	Total	2		1.66E-05
Child (2 - 16)	Operation	14	0.01525	5.52E-06
Adult (16 - 30)	Operation	14	0.01525	6.13E-07
Lifetime		**30**		**2.53E-05**

As demonstrated in the table above, the excess cancer risks for the 3rd trimester of pregnancy, infants, children, and adults at the MEIR located approximately 100 meters away, over the course of Project construction and operation, are approximately 2.62, 16.6, 5.52, and 0.613 in one million, respectively. The excess cancer risk over the course of a residential lifetime (30 years) is approximately 25.3 in one million. The child and lifetime cancer risks exceed the SCAQMD threshold of 10 in one million, thus resulting in a potentially significant impact not previously addressed or identified by the IS/MND.

Our analysis represents a screening-level HRA, which is known to be conservative and tends to err on the side of health protection. The purpose of the screening-level HRA is to demonstrate the potential link between Project-generated emissions and adverse health risk impacts. According to the U.S. EPA:

> "EPA's Exposure Assessment Guidelines recommend completing exposure assessments iteratively using a tiered approach to 'strike a balance between the costs of adding detail and refinement to an assessment and the benefits associated with that additional refinement' (U.S. EPA, 1992).
>
> In other words, an assessment using basic tools (e.g., simple exposure calculations, default values, rules of thumb, conservative assumptions) can be conducted as the first phase (or tier) of the overall assessment (i.e., a screening-level assessment).
>
> The exposure assessor or risk manager can then determine whether the results of the screening-level assessment warrant further evaluation through refinements of the input data and exposure assumptions or by using more advanced models."

As demonstrated above, screening-level analyses warrant further evaluation in a refined modeling approach. Thus, as our screening-level HRA demonstrates that construction and operation of the Project could result in a potentially significant health risk impact, an EIR should be prepared to include a refined health risk analysis which adequately and accurately evaluates health risk impacts associated with both Project construction and operation.

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 459 metric tons of carbon dioxide equivalents per year ("MT CO_2e/year") (see excerpt below) (p. 4.8-4, Table 4.8-1).

Table 4.8-1
UNMITIGATED ANNUAL GHG EMISSIONS, 2019 AND BEYOND
(Emissions in metric tons, or MT)

Category	CO_2e (MT/year)
Direct – (Amortized Construction)	7.16
Direct – Mobile (Operational)	228.39
Direct – Purchased Natural Gas	11.05
Direct – Area Source	<0.01
Indirect – Purchased Electricity (Power)	57.53
Indirect – Purchased Electricity (Water)	106.90
Direct – Fugitive – Solid Waste	48.40
TOTAL	$\boxed{\textbf{459}}$

As such, the IS/MND concludes:

> "Total unmitigated operational CO_2e emissions from the project would be 452 MT of CO_2e per year. Mobile sources account for about 50.5% of these emissions. With the addition of the amortized construction emissions, the total project GHG emissions would be 459 MT of CO_2e per year, which is less than the significance threshold of 3,000 MT of CO_2e per year. Therefore, GHG emissions would be less than significant, and no mitigation is necessary" (p. 4.8-5).

However, the IS/MND's analysis, as well as the subsequent less-than-significant impact conclusion, is incorrect for three reasons.

(1) The IS/MND's quantitative GHG analysis relies upon an incorrect and unsubstantiated air model;
(2) The IS/MND's quantitative GHG analysis relies upon an outdated threshold; and
(3) The IS/MND fails to identify a potentially significant GHG impact;

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 459 MT CO_2e/year (p. 4.8-4, Table 4.8-1). However, the IS/MND's quantitative GHG analysis is unsubstantiated. As previously discussed, when we reviewed the Project's CalEEMod output files, provided in the AQ & GHG Study as Appendix B to the IS/MND, we found that several of the values inputted into the model were not consistent with information disclosed in the IS/MND. As a result, the model underestimates the Project's emissions, and the IS/MND's quantitative GHG analysis should not be relied upon to determine Project significance. An EIR should be prepared that adequately assesses the potential GHG impacts that construction and operation of the proposed Project may have on the surrounding environment.

2) Incorrect Reliance on an Outdated Quantitative GHG Threshold

As previously stated, the IS/MND estimates that the Project would generate net annual GHG emissions of 459 MT CO_2e/year, which would not exceed the SCAQMD bright-line threshold of 3,000 MT CO_2e/year (p. 4.8-4, Table 4.8-1, 4.8-5). However, the guidance that provided the 3,000 MT CO_2e/year threshold, SCAQMD's 2008 *Interim CEQA GHG Significance Threshold for Stationary Sources, Rules, and Plans* report, was developed when the Global Warming Solutions Act of 2006, commonly known as "AB 32", was the governing statute for GHG reductions in California. AB 32 requires California to reduce GHG emissions to 1990 levels by 2020. [52] Furthermore, AEP guidance states:

> "[F]or evaluating projects with a post 2020 horizon, the threshold will need to be revised based on a new gap analysis that would examine 17 development and reduction potentials out to the next GHG reduction milestone." [53]

As it is currently July 2022, thresholds for 2020 are not applicable to the proposed Project and should be revised to reflect the current GHG reduction target. As such, the SCAQMD bright-line threshold of 3,000 MT CO_2e/year is outdated and inapplicable to the proposed Project, and the IS/MND's less-than-significant GHG impact conclusion should not be relied upon. Instead, we recommend that the Project apply the SCAQMD 2035 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.[54]

3) Failure to Identify a Potentially Significant GHG Impact

In an effort to quantitatively evaluate the Project's GHG emissions, we compared the Project's GHG emissions, as estimated by the IS/MND, to the SCAQMD 2035 efficiency target of 3.0 MT CO_2e/SP/year.[55] When applying this threshold, the Project's incorrect and unsubstantiated air model indicates a potentially significant GHG impact.

As previously stated, the IS/MND estimates that the Project would generate net annual GHG emissions of 459 MT CO_2e/year (p. 4.8-4, Table 4.8-1). Furthermore, according to CAPCOA's *CEQA & Climate Change* report, service population ("SP") is defined as "the sum of the number of residents and the number of jobs supported by the project."[56] The IS/MND estimates that the Project would support 32 full-time employees (p. 3-13). As the Project does not include any resiendtial land uses, we estimate a SP of 32 people.[57] When dividing the Project's net annual GHG emissions, as estimated by the IS/MND, by a

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[52] HEALTH & SAFETY CODE 38550, *available at:* https://leginfo.legislature.ca.gov/faces/codes_displaySection.xhtml?lawCode=HSC&sectionNum=38550.

[53] "Beyond Newhall and 2020: A Field Guide to New CEQA Greenhouse Gas Thresholds and Climate Action Plan Targets for California." Association of Environmental Professionals (AEP), October 2016, *available at:* https://califaep.org/docs/AEP-2016_Final_White_Paper.pdf, p. 39.

[54] "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.

[55] "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.

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

[57] Calculated: 0 residents + 32 employees = 32 service population.

SP of 32 people, we find that the Project would emit approximately 14.3 MT CO_2e/SP/year (see table below).[58]

IS/MND Greenhouse Gas Emissions	
Annual Emissions (MT CO_2e/year)	459
Service Population	32
Service Population Efficiency (MT CO_2e/SP/year)	14.3
SCAQMD 2035 Target	**3.0**
Exceeds?	***Yes***

As demonstrated above, the Project's service population efficiency value, as calculated using the IS/MND's net annual GHG emissions and SP, exceeds the SCAQMD 2035 efficiency target of 3.0 MT CO_2e/SP/year, indicating a potentially significant impact not previously identified or addressed by the IS/MND. As a result, the IS/MND's less-than-significant GHG impact conclusion should not be relied upon. 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.

Mitigation

Feasible Mitigation Measures Available to Reduce Emissions

Our analysis demonstrates that the Project would result in potentially significant air quality, health risk, and GHG impacts that should be mitigated further. In an effort to reduce the Project's emissions, we identified several mitigation measures that are applicable to the proposed Project. Feasible mitigation measures can be found in the Department of Justice Warehouse Project Best Practices document.[59] Therefore, to reduce the Project's emissions, consideration of the following measures should be made:

- Requiring off-road construction equipment to be zero-emission, where available, and all diesel-fueled off-road construction equipment, to be equipped with CARB Tier IV-compliant engines or better, and including this requirement in applicable bid documents, purchase orders, and contracts, with successful contractors demonstrating the ability to supply the compliant construction equipment for use prior to any ground-disturbing and construction activities.
- Prohibiting off-road diesel-powered equipment from being in the "on" position for more than 10 hours per day.
- Requiring on-road heavy-duty haul trucks to be model year 2010 or newer if diesel-fueled.
- Providing electrical hook ups to the power grid, rather than use of diesel-fueled generators, for electric construction tools, such as saws, drills and compressors, and using electric tools whenever feasible.
- Limiting the amount of daily grading disturbance area.

[58] Calculated: (459 MT CO_2e/year) / (32 service population) = (14.3 MT CO_2e/SP/year).
[59] "Warehouse Projects: Best Practices and Mitigation Measures to Comply with the California Environmental Quality Act." State of California Department of Justice.

- Prohibiting grading on days with an Air Quality Index forecast of greater than 100 for particulates or ozone for the project area.
- Forbidding idling of heavy equipment for more than two minutes.
- Keeping onsite and furnishing to the lead agency or other regulators upon request, all equipment maintenance records and data sheets, including design specifications and emission control tier classifications.
- Conducting an on-site inspection to verify compliance with construction mitigation and to identify other opportunities to further reduce construction impacts.
- Using paints, architectural coatings, and industrial maintenance coatings that have volatile organic compound levels of less than 10 g/L.
- Providing information on transit and ridesharing programs and services to construction employees.
- Providing meal options onsite or shuttles between the facility and nearby meal destinations for construction employees.
- Requiring that all facility-owned and operated fleet equipment with a gross vehicle weight rating greater than 14,000 pounds accessing the site meet or exceed 2010 model-year emissions equivalent engine standards as currently defined in California Code of Regulations Title 13, Division 3, Chapter 1, Article 4.5, Section 2025. Facility operators shall maintain records on-site demonstrating compliance with this requirement and shall make records available for inspection by the local jurisdiction, air district, and state upon request.
- Requiring all heavy-duty vehicles entering or operated on the project site to be zero-emission beginning in 2030.
- Requiring on-site equipment, such as forklifts and yard trucks, to be electric with the necessary electrical charging stations provided.
- Requiring tenants to use zero-emission light- and medium-duty vehicles as part of business operations.
- Forbidding trucks from idling for more than two minutes and requiring operators to turn off engines when not in use.
- Posting both interior- and exterior-facing signs, including signs directed at all dock and delivery areas, identifying idling restrictions and contact information to report violations to CARB, the air district, and the building manager.
- Installing and maintaining, at the manufacturer's recommended maintenance intervals, air filtration systems at sensitive receptors within a certain radius of facility for the life of the project.
- Installing and maintaining, at the manufacturer's recommended maintenance intervals, an air monitoring station proximate to sensitive receptors and the facility for the life of the project, and making the resulting data publicly available in real time. While air monitoring does not mitigate the air quality or greenhouse gas impacts of a facility, it nonetheless benefits the affected community by providing information that can be used to improve air quality or avoid exposure to unhealthy air.

- Constructing electric truck charging stations proportional to the number of dock doors at the project.
- Constructing electric plugs for electric transport refrigeration units at every dock door, if the warehouse use could include refrigeration.
- Constructing electric light-duty vehicle charging stations proportional to the number of parking spaces at the project.
- Installing solar photovoltaic systems on the project site of a specified electrical generation capacity, such as equal to the building's projected energy needs.
- Requiring all stand-by emergency generators to be powered by a non-diesel fuel.
- Requiring facility operators to train managers and employees on efficient scheduling and load management to eliminate unnecessary queuing and idling of trucks.
- Requiring operators to establish and promote a rideshare program that discourages single-occupancy vehicle trips and provides financial incentives for alternate modes of transportation, including carpooling, public transit, and biking.
- Meeting CalGreen Tier 2 green building standards, including all provisions related to designated parking for clean air vehicles, electric vehicle charging, and bicycle parking.
- Achieving certification of compliance with LEED green building standards.
- Providing meal options onsite or shuttles between the facility and nearby meal destinations.
- Posting signs at every truck exit driveway providing directional information to the truck route.
- Improving and maintaining vegetation and tree canopy for residents in and around the project area.
- Requiring that every tenant train its staff in charge of keeping vehicle records in diesel technologies and compliance with CARB regulations, by attending CARB approved courses. Also require facility operators to maintain records on-site demonstrating compliance and make records available for inspection by the local jurisdiction, air district, and state upon request.
- Requiring tenants to enroll in the United States Environmental Protection Agency's SmartWay program, and requiring tenants to use carriers that are SmartWay carriers.
- Providing tenants with information on incentive programs, such as the Carl Moyer Program and Voucher Incentive Program, to upgrade their fleets.

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 updated air quality, health risk, and GHG analyses 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: CalEEMod Output Files
Attachment B: Health Risk Calculations
Attachment C: AERSCREEN Output Files
Attachment D: Matt Hagemann CV
Attachment E: Paul Rosenfeld CV

Attachment A

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Summit Avenue Warehouse

San Bernardino-South Coast County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Unrefrigerated Warehouse-No Rail	92.38	1000sqft	2.12	92,380.00	0
General Office Building	10.00	1000sqft	0.23	10,000.00	0
Parking Lot	56.00	Space	0.50	22,400.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	32
Climate Zone	10			**Operational Year**	2024
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	531.98	**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 - See SWAPE comments on "Failure to Consider Potential Cold Storage Requirements" and "Failure to Model All Proposed Land Uses."

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

Off-road Equipment - See SWAPE comment on "Unsubstantiated Changes to Construction Off-Road Equipment Unit Amounts and Usage Hours."

Grading - See SWAPE comment on "Failure to Substantiate Amount of Material Import or Export."

Off-road Equipment - See SWAPE comment on "Unsubstantiated Changes to Construction Off-Road Equipment Unit Amounts and Usage Hours."

Off-road Equipment - See SWAPE comment on "Unsubstantiated Changes to Construction Off-Road Equipment Unit Amounts and Usage Hours."

Off-road Equipment - See SWAPE comment on "Unsubstantiated Changes to Construction Off-Road Equipment Unit Amounts and Usage Hours."

Off-road Equipment - See SWAPE comment on "Unsubstantiated Changes to Construction Off-Road Equipment Unit Amounts and Usage Hours."

Trips and VMT - Consistent with the IS/MND's model.

Architectural Coating - See SWAPE comment on "Unsubstantiated Reductions to Architectural Coating Emission Factor."

Vehicle Trips - See SWAPE comment on "Underestimated Operational Daily Vehicle Trip Rates."

Fleet Mix - Consistent with the IS/MND's model.

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	220.00	140.00
tblConstructionPhase	PhaseEndDate	7/12/2023	2/22/2023
tblConstructionPhase	PhaseEndDate	6/14/2023	1/25/2023
tblConstructionPhase	PhaseEndDate	8/10/2022	7/13/2022
tblConstructionPhase	PhaseEndDate	6/28/2023	2/8/2023
tblConstructionPhase	PhaseEndDate	8/2/2022	7/5/2022
tblConstructionPhase	PhaseStartDate	6/29/2023	2/9/2023
tblConstructionPhase	PhaseStartDate	8/11/2022	7/14/2022
tblConstructionPhase	PhaseStartDate	8/3/2022	7/6/2022
tblConstructionPhase	PhaseStartDate	6/15/2023	1/26/2023
tblConstructionPhase	PhaseStartDate	7/29/2022	7/1/2022
tblFleetMix	HHD	0.02	0.06
tblFleetMix	LDA	0.54	0.55
tblFleetMix	LDT1	0.06	0.04
tblFleetMix	LDT2	0.17	0.18
tblFleetMix	LHD1	0.03	0.02
tblFleetMix	LHD2	7.1040e-003	5.1010e-003
tblFleetMix	MCY	0.03	5.9030e-003
tblFleetMix	MDV	0.14	0.12
tblFleetMix	MH	4.8300e-003	9.4400e-004
tblFleetMix	MHD	0.01	0.02
tblFleetMix	OBUS	5.5400e-004	1.3570e-003
tblFleetMix	SBUS	9.5400e-004	8.0800e-004
tblFleetMix	UBUS	2.5100e-004	1.5650e-003

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

tblProjectCharacteristics	CO2IntensityFactor	390.98	531.98
tblTripsAndVMT	WorkerTripNumber	8.00	18.00
tblTripsAndVMT	WorkerTripNumber	10.00	15.00
tblTripsAndVMT	WorkerTripNumber	15.00	20.00
tblVehicleTrips	ST_TR	2.21	0.00
tblVehicleTrips	ST_TR	1.74	1.93
tblVehicleTrips	SU_TR	0.70	0.00
tblVehicleTrips	SU_TR	1.74	1.93
tblVehicleTrips	WD_TR	9.74	0.00
tblVehicleTrips	WD_TR	1.74	1.93

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	0.1340	1.0309	1.0510	2.1600e-003	0.0662	0.0468	0.1130	0.0220	0.0447	0.0667	0.0000	185.3164	185.3164	0.0286	4.0900e-003	187.2498
2023	0.5014	0.1804	0.2179	4.2000e-004	7.8100e-003	8.1300e-003	0.0159	2.1000e-003	7.7200e-003	9.8300e-003	0.0000	36.0139	36.0139	6.2900e-003	6.1000e-004	36.3515
Maximum	**0.5014**	**1.0309**	**1.0510**	**2.1600e-003**	**0.0662**	**0.0468**	**0.1130**	**0.0220**	**0.0447**	**0.0667**	**0.0000**	**185.3164**	**185.3164**	**0.0286**	**4.0900e-003**	**187.2498**

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	0.1340	1.0309	1.0510	2.1600e-003	0.0662	0.0468	0.1130	0.0220	0.0447	0.0667	0.0000	185.3162	185.3162	0.0286	4.0900e-003	187.2496
2023	0.5014	0.1804	0.2179	4.2000e-004	7.8100e-003	8.1300e-003	0.0159	2.1000e-003	7.7200e-003	9.8300e-003	0.0000	36.0139	36.0139	6.2900e-003	6.1000e-004	36.3514
Maximum	**0.5014**	**1.0309**	**1.0510**	**2.1600e-003**	**0.0662**	**0.0468**	**0.1130**	**0.0220**	**0.0447**	**0.0667**	**0.0000**	**185.3162**	**185.3162**	**0.0286**	**4.0900e-003**	**187.2496**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not 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	**7-1-2022**	**9-30-2022**	0.5839	0.5839
2	**10-1-2022**	**12-31-2022**	0.5837	0.5837
3	**1-1-2023**	**3-31-2023**	0.6808	0.6808
		Highest	0.6808	0.6808

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	0.4194	2.0000e-005	2.0200e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	3.9300e-003	3.9300e-003	1.0000e-005	0.0000	4.1900e-003
Energy	1.1900e-003	0.0108	9.0600e-003	6.0000e-005		8.2000e-004	8.2000e-004		8.2000e-004	8.2000e-004	0.0000	87.5229	87.5229	4.9300e-003	7.9000e-004	87.8800
Mobile	0.0605	0.2618	0.8809	3.0900e-003	0.2900	2.9200e-003	0.2929	0.0776	2.7500e-003	0.0804	0.0000	290.2011	290.2011	0.0145	0.0193	296.3239
Waste						0.0000	0.0000		0.0000	0.0000	19.5156	0.0000	19.5156	1.1533	0.0000	48.3490
Water						0.0000	0.0000		0.0000	0.0000	7.3413	75.6268	82.9681	0.7587	0.0184	107.4111
Total	**0.4811**	**0.2726**	**0.8919**	**3.1500e-003**	**0.2900**	**3.7500e-003**	**0.2937**	**0.0776**	**3.5800e-003**	**0.0812**	**26.8569**	**453.3547**	**480.2116**	**1.9315**	**0.0385**	**539.9681**

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	0.4194	2.0000e-005	2.0200e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	3.9300e-003	3.9300e-003	1.0000e-005	0.0000	4.1900e-003
Energy	1.1900e-003	0.0108	9.0600e-003	6.0000e-005		8.2000e-004	8.2000e-004		8.2000e-004	8.2000e-004	0.0000	87.5229	87.5229	4.9300e-003	7.9000e-004	87.8800
Mobile	0.0605	0.2618	0.8809	3.0900e-003	0.2900	2.9200e-003	0.2929	0.0776	2.7500e-003	0.0804	0.0000	290.2011	290.2011	0.0145	0.0193	296.3239
Waste						0.0000	0.0000		0.0000	0.0000	19.5156	0.0000	19.5156	1.1533	0.0000	48.3490
Water						0.0000	0.0000		0.0000	0.0000	7.3413	75.6268	82.9681	0.7587	0.0184	107.4111
Total	**0.4811**	**0.2726**	**0.8919**	**3.1500e-003**	**0.2900**	**3.7500e-003**	**0.2937**	**0.0776**	**3.5800e-003**	**0.0812**	**26.8569**	**453.3547**	**480.2116**	**1.9315**	**0.0385**	**539.9681**

	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	Site Preparation	Site Preparation	7/1/2022	7/5/2022	5	3	
2	Grading	Grading	7/6/2022	7/13/2022	5	6	
3	Construction	Building Construction	7/14/2022	1/25/2023	5	140	

4	Paving	Paving	1/26/2023	2/8/2023	5	10	
5	Painting	Architectural Coating	2/9/2023	2/22/2023	5	10	

Acres of Grading (Site Preparation Phase): 4.5

Acres of Grading (Grading Phase): 6

Acres of Paving: 0.5

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 153,570; Non-Residential Outdoor: 51,190; Striped Parking Area: 1,344 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Painting	Air Compressors	1	6.00	78	0.48
Paving	Cement and Mortar Mixers	1	8.00	9	0.56
Construction	Cranes	1	8.00	231	0.29
Construction	Forklifts	2	7.00	89	0.20
Construction	Generator Sets	1	8.00	84	0.74
Grading	Graders	1	8.00	187	0.41
Site Preparation	Graders	1	8.00	187	0.41
Paving	Pavers	1	8.00	130	0.42
Paving	Paving Equipment	1	8.00	132	0.36
Paving	Rollers	2	8.00	80	0.38
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Site Preparation	Scrapers	1	8.00	367	0.48
Construction	Tractors/Loaders/Backhoes	1	6.00	97	0.37
Grading	Tractors/Loaders/Backhoes	2	7.00	97	0.37
Paving	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Site Preparation	Tractors/Loaders/Backhoes	1	7.00	97	0.37
Construction	Welders	3	8.00	46	0.45

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
Site Preparation	3	18.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Grading	4	15.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Construction	8	51.00	20.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	20.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Painting	1	10.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Site Preparation - 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					2.3900e-003	0.0000	2.3900e-003	2.6000e-004	0.0000	2.6000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.0700e-003	0.0235	0.0151	4.0000e-005		8.9000e-004	8.9000e-004		8.2000e-004	8.2000e-004	0.0000	3.2321	3.2321	1.0500e-003	0.0000	3.2582
Total	**2.0700e-003**	**0.0235**	**0.0151**	**4.0000e-005**	**2.3900e-003**	**8.9000e-004**	**3.2800e-003**	**2.6000e-004**	**8.2000e-004**	**1.0800e-003**	**0.0000**	**3.2321**	**3.2321**	**1.0500e-003**	**0.0000**	**3.2582**

3.2 Site Preparation - 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	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	1.0000e-004	8.0000e-005	9.6000e-004	0.0000	3.0000e-004	0.0000	3.0000e-004	8.0000e-005	0.0000	8.0000e-005	0.0000	0.2360	0.2360	1.0000e-005	1.0000e-005	0.2382
Total	**1.0000e-004**	**8.0000e-005**	**9.6000e-004**	**0.0000**	**3.0000e-004**	**0.0000**	**3.0000e-004**	**8.0000e-005**	**0.0000**	**8.0000e-005**	**0.0000**	**0.2360**	**0.2360**	**1.0000e-005**	**1.0000e-005**	**0.2382**

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					2.3900e-003	0.0000	2.3900e-003	2.6000e-004	0.0000	2.6000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.0700e-003	0.0235	0.0151	4.0000e-005		8.9000e-004	8.9000e-004		8.2000e-004	8.2000e-004	0.0000	3.2321	3.2321	1.0500e-003	0.0000	3.2582
Total	**2.0700e-003**	**0.0235**	**0.0151**	**4.0000e-005**	**2.3900e-003**	**8.9000e-004**	**3.2800e-003**	**2.6000e-004**	**8.2000e-004**	**1.0800e-003**	**0.0000**	**3.2321**	**3.2321**	**1.0500e-003**	**0.0000**	**3.2582**

3.2 Site Preparation - 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	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	1.0000e-004	8.0000e-005	9.6000e-004	0.0000	3.0000e-004	0.0000	3.0000e-004	8.0000e-005	0.0000	8.0000e-005	0.0000	0.2360	0.2360	1.0000e-005	1.0000e-005	0.2382
Total	**1.0000e-004**	**8.0000e-005**	**9.6000e-004**	**0.0000**	**3.0000e-004**	**0.0000**	**3.0000e-004**	**8.0000e-005**	**0.0000**	**8.0000e-005**	**0.0000**	**0.2360**	**0.2360**	**1.0000e-005**	**1.0000e-005**	**0.2382**

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					0.0213	0.0000	0.0213	0.0103	0.0000	0.0103	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	4.6200e-003	0.0510	0.0277	6.0000e-005		2.2300e-003	2.2300e-003		2.0500e-003	2.0500e-003	0.0000	5.4308	5.4308	1.7600e-003	0.0000	5.4747
Total	**4.6200e-003**	**0.0510**	**0.0277**	**6.0000e-005**	**0.0213**	**2.2300e-003**	**0.0235**	**0.0103**	**2.0500e-003**	**0.0123**	**0.0000**	**5.4308**	**5.4308**	**1.7600e-003**	**0.0000**	**5.4747**

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	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	1.7000e-004	1.3000e-004	1.5900e-003	0.0000	4.9000e-004	0.0000	5.0000e-004	1.3000e-004	0.0000	1.3000e-004	0.0000	0.3932	0.3932	1.0000e-005	1.0000e-005	0.3969
Total	**1.7000e-004**	**1.3000e-004**	**1.5900e-003**	**0.0000**	**4.9000e-004**	**0.0000**	**5.0000e-004**	**1.3000e-004**	**0.0000**	**1.3000e-004**	**0.0000**	**0.3932**	**0.3932**	**1.0000e-005**	**1.0000e-005**	**0.3969**

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					0.0213	0.0000	0.0213	0.0103	0.0000	0.0103	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	4.6200e-003	0.0510	0.0277	6.0000e-005		2.2300e-003	2.2300e-003		2.0500e-003	2.0500e-003	0.0000	5.4308	5.4308	1.7600e-003	0.0000	5.4747
Total	**4.6200e-003**	**0.0510**	**0.0277**	**6.0000e-005**	**0.0213**	**2.2300e-003**	**0.0235**	**0.0103**	**2.0500e-003**	**0.0123**	**0.0000**	**5.4308**	**5.4308**	**1.7600e-003**	**0.0000**	**5.4747**

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	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	1.7000e-004	1.3000e-004	1.5900e-003	0.0000	4.9000e-004	0.0000	5.0000e-004	1.3000e-004	0.0000	1.3000e-004	0.0000	0.3932	0.3932	1.0000e-005	1.0000e-005	0.3969
Total	**1.7000e-004**	**1.3000e-004**	**1.5900e-003**	**0.0000**	**4.9000e-004**	**0.0000**	**5.0000e-004**	**1.3000e-004**	**0.0000**	**1.3000e-004**	**0.0000**	**0.3932**	**0.3932**	**1.0000e-005**	**1.0000e-005**	**0.3969**

3.4 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	0.1132	0.8909	0.8756	1.5300e-003		0.0428	0.0428		0.0411	0.0411	0.0000	126.6849	126.6849	0.0244	0.0000	127.2959
Total	**0.1132**	**0.8909**	**0.8756**	**1.5300e-003**		**0.0428**	**0.0428**		**0.0411**	**0.0411**	**0.0000**	**126.6849**	**126.6849**	**0.0244**	**0.0000**	**127.2959**

3.4 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	2.0800e-003	0.0562	0.0199	2.3000e-004	7.6900e-003	6.4000e-004	8.3300e-003	2.2200e-003	6.1000e-004	2.8300e-003	0.0000	22.1532	22.1532	6.0000e-004	3.2800e-003	23.1458
Worker	0.0117	9.2000e-003	0.1102	3.0000e-004	0.0341	1.8000e-004	0.0343	9.0600e-003	1.7000e-004	9.2300e-003	0.0000	27.1863	27.1863	7.8000e-004	7.9000e-004	27.4401
Total	**0.0138**	**0.0654**	**0.1302**	**5.3000e-004**	**0.0418**	**8.2000e-004**	**0.0426**	**0.0113**	**7.8000e-004**	**0.0121**	**0.0000**	**49.3395**	**49.3395**	**1.3800e-003**	**4.0700e-003**	**50.5859**

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	0.1132	0.8908	0.8756	1.5300e-003		0.0428	0.0428		0.0411	0.0411	0.0000	126.6847	126.6847	0.0244	0.0000	127.2957
Total	**0.1132**	**0.8908**	**0.8756**	**1.5300e-003**		**0.0428**	**0.0428**		**0.0411**	**0.0411**	**0.0000**	**126.6847**	**126.6847**	**0.0244**	**0.0000**	**127.2957**

3.4 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	2.0800e-003	0.0562	0.0199	2.3000e-004	7.6900e-003	6.4000e-004	8.3300e-003	2.2200e-003	6.1000e-004	2.8300e-003	0.0000	22.1532	22.1532	6.0000e-004	3.2800e-003	23.1458
Worker	0.0117	9.2000e-003	0.1102	3.0000e-004	0.0341	1.8000e-004	0.0343	9.0600e-003	1.7000e-004	9.2300e-003	0.0000	27.1863	27.1863	7.8000e-004	7.9000e-004	27.4401
Total	**0.0138**	**0.0654**	**0.1302**	**5.3000e-004**	**0.0418**	**8.2000e-004**	**0.0426**	**0.0113**	**7.8000e-004**	**0.0121**	**0.0000**	**49.3395**	**49.3395**	**1.3800e-003**	**4.0700e-003**	**50.5859**

3.4 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	0.0154	0.1226	0.1279	2.3000e-004		5.5200e-003	5.5200e-003		5.2900e-003	5.2900e-003	0.0000	18.6932	18.6932	3.5400e-003	0.0000	18.7816
Total	**0.0154**	**0.1226**	**0.1279**	**2.3000e-004**		**5.5200e-003**	**5.5200e-003**		**5.2900e-003**	**5.2900e-003**	**0.0000**	**18.6932**	**18.6932**	**3.5400e-003**	**0.0000**	**18.7816**

3.4 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	2.0000e-004	6.6400e-003	2.6900e-003	3.0000e-005	1.1400e-003	5.0000e-005	1.1800e-003	3.3000e-004	5.0000e-005	3.7000e-004	0.0000	3.1371	3.1371	8.0000e-005	4.6000e-004	3.2773
Worker	1.6000e-003	1.1900e-003	0.0149	4.0000e-005	5.0300e-003	3.0000e-005	5.0600e-003	1.3400e-003	2.0000e-005	1.3600e-003	0.0000	3.8820	3.8820	1.0000e-004	1.1000e-004	3.9164
Total	**1.8000e-003**	**7.8300e-003**	**0.0176**	**7.0000e-005**	**6.1700e-003**	**8.0000e-005**	**6.2400e-003**	**1.6700e-003**	**7.0000e-005**	**1.7300e-003**	**0.0000**	**7.0191**	**7.0191**	**1.8000e-004**	**5.7000e-004**	**7.1937**

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	0.0154	0.1226	0.1279	2.3000e-004		5.5200e-003	5.5200e-003		5.2900e-003	5.2900e-003	0.0000	18.6932	18.6932	3.5400e-003	0.0000	18.7815
Total	**0.0154**	**0.1226**	**0.1279**	**2.3000e-004**		**5.5200e-003**	**5.5200e-003**		**5.2900e-003**	**5.2900e-003**	**0.0000**	**18.6932**	**18.6932**	**3.5400e-003**	**0.0000**	**18.7815**

3.4 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	2.0000e-004	6.6400e-003	2.6900e-003	3.0000e-005	1.1400e-003	5.0000e-005	1.1800e-003	3.3000e-004	5.0000e-005	3.7000e-004	0.0000	3.1371	3.1371	8.0000e-005	4.6000e-004	3.2773
Worker	1.6000e-003	1.1900e-003	0.0149	4.0000e-005	5.0300e-003	3.0000e-005	5.0600e-003	1.3400e-003	2.0000e-005	1.3600e-003	0.0000	3.8820	3.8820	1.0000e-004	1.1000e-004	3.9164
Total	**1.8000e-003**	**7.8300e-003**	**0.0176**	**7.0000e-005**	**6.1700e-003**	**8.0000e-005**	**6.2400e-003**	**1.6700e-003**	**7.0000e-005**	**1.7300e-003**	**0.0000**	**7.0191**	**7.0191**	**1.8000e-004**	**5.7000e-004**	**7.1937**

3.5 Paving - 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	4.4000e-003	0.0431	0.0584	9.0000e-005		2.1700e-003	2.1700e-003		2.0000e-003	2.0000e-003	0.0000	7.7564	7.7564	2.4600e-003	0.0000	7.8179
Paving	6.6000e-004					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**5.0600e-003**	**0.0431**	**0.0584**	**9.0000e-005**		**2.1700e-003**	**2.1700e-003**		**2.0000e-003**	**2.0000e-003**	**0.0000**	**7.7564**	**7.7564**	**2.4600e-003**	**0.0000**	**7.8179**

3.5 Paving - 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	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	3.5000e-004	2.6000e-004	3.2500e-003	1.0000e-005	1.1000e-003	1.0000e-005	1.1000e-003	2.9000e-004	1.0000e-005	3.0000e-004	0.0000	0.8458	0.8458	2.0000e-005	2.0000e-005	0.8532
Total	**3.5000e-004**	**2.6000e-004**	**3.2500e-003**	**1.0000e-005**	**1.1000e-003**	**1.0000e-005**	**1.1000e-003**	**2.9000e-004**	**1.0000e-005**	**3.0000e-004**	**0.0000**	**0.8458**	**0.8458**	**2.0000e-005**	**2.0000e-005**	**0.8532**

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	4.4000e-003	0.0431	0.0584	9.0000e-005		2.1700e-003	2.1700e-003		2.0000e-003	2.0000e-003	0.0000	7.7564	7.7564	2.4600e-003	0.0000	7.8178
Paving	6.6000e-004					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**5.0600e-003**	**0.0431**	**0.0584**	**9.0000e-005**		**2.1700e-003**	**2.1700e-003**		**2.0000e-003**	**2.0000e-003**	**0.0000**	**7.7564**	**7.7564**	**2.4600e-003**	**0.0000**	**7.8178**

3.5 Paving - 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	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	3.5000e-004	2.6000e-004	3.2500e-003	1.0000e-005	1.1000e-003	1.0000e-005	1.1000e-003	2.9000e-004	1.0000e-005	3.0000e-004	0.0000	0.8458	0.8458	2.0000e-005	2.0000e-005	0.8532
Total	**3.5000e-004**	**2.6000e-004**	**3.2500e-003**	**1.0000e-005**	**1.1000e-003**	**1.0000e-005**	**1.1000e-003**	**2.9000e-004**	**1.0000e-005**	**3.0000e-004**	**0.0000**	**0.8458**	**0.8458**	**2.0000e-005**	**2.0000e-005**	**0.8532**

3.6 Painting - 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					
Archit. Coating	0.4777					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	9.6000e-004	6.5100e-003	9.0600e-003	1.0000e-005		3.5000e-004	3.5000e-004		3.5000e-004	3.5000e-004	0.0000	1.2766	1.2766	8.0000e-005	0.0000	1.2785
Total	**0.4786**	**6.5100e-003**	**9.0600e-003**	**1.0000e-005**		**3.5000e-004**	**3.5000e-004**		**3.5000e-004**	**3.5000e-004**	**0.0000**	**1.2766**	**1.2766**	**8.0000e-005**	**0.0000**	**1.2785**

3.6 Painting - 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	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	1.7000e-004	1.3000e-004	1.6200e-003	0.0000	5.5000e-004	0.0000	5.5000e-004	1.5000e-004	0.0000	1.5000e-004	0.0000	0.4229	0.4229	1.0000e-005	1.0000e-005	0.4266
Total	**1.7000e-004**	**1.3000e-004**	**1.6200e-003**	**0.0000**	**5.5000e-004**	**0.0000**	**5.5000e-004**	**1.5000e-004**	**0.0000**	**1.5000e-004**	**0.0000**	**0.4229**	**0.4229**	**1.0000e-005**	**1.0000e-005**	**0.4266**

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	0.4777					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	9.6000e-004	6.5100e-003	9.0600e-003	1.0000e-005		3.5000e-004	3.5000e-004		3.5000e-004	3.5000e-004	0.0000	1.2766	1.2766	8.0000e-005	0.0000	1.2785
Total	**0.4786**	**6.5100e-003**	**9.0600e-003**	**1.0000e-005**		**3.5000e-004**	**3.5000e-004**		**3.5000e-004**	**3.5000e-004**	**0.0000**	**1.2766**	**1.2766**	**8.0000e-005**	**0.0000**	**1.2785**

3.6 Painting - 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	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	1.7000e-004	1.3000e-004	1.6200e-003	0.0000	5.5000e-004	0.0000	5.5000e-004	1.5000e-004	0.0000	1.5000e-004	0.0000	0.4229	0.4229	1.0000e-005	1.0000e-005	0.4266
Total	**1.7000e-004**	**1.3000e-004**	**1.6200e-003**	**0.0000**	**5.5000e-004**	**0.0000**	**5.5000e-004**	**1.5000e-004**	**0.0000**	**1.5000e-004**	**0.0000**	**0.4229**	**0.4229**	**1.0000e-005**	**1.0000e-005**	**0.4266**

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 Not 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	0.0605	0.2618	0.8809	3.0900e-003	0.2900	2.9200e-003	0.2929	0.0776	2.7500e-003	0.0804	0.0000	290.2011	290.2011	0.0145	0.0193	296.3239
Unmitigated	0.0605	0.2618	0.8809	3.0900e-003	0.2900	2.9200e-003	0.2929	0.0776	2.7500e-003	0.0804	0.0000	290.2011	290.2011	0.0145	0.0193	296.3239

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
General Office Building	0.00	0.00	0.00		
Parking Lot	0.00	0.00	0.00		
Unrefrigerated Warehouse-No Rail	178.00	178.00	178.00	762,848	762,848
Total	178.00	178.00	178.00	762,848	762,848

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
Unrefrigerated Warehouse-No Rail	16.60	8.40	6.90	59.00	0.00	41.00	92	5	3

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
General Office Building	0.540566	0.056059	0.172680	0.136494	0.026304	0.007104	0.011680	0.017449	0.000554	0.000251	0.025076	0.000954	0.004830
Parking Lot	0.540566	0.056059	0.172680	0.136494	0.026304	0.007104	0.011680	0.017449	0.000554	0.000251	0.025076	0.000954	0.004830

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Unrefrigerated Warehouse-No Rail	0.553113	0.036408	0.180286	0.116335	0.016165	0.005101	0.018218	0.063797	0.001357	0.001565	0.005903	0.000808	0.000944

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	75.7837	75.7837	4.7000e-003	5.7000e-004	76.0711
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	75.7837	75.7837	4.7000e-003	5.7000e-004	76.0711
NaturalGas Mitigated	1.1900e-003	0.0108	9.0600e-003	6.0000e-005		8.2000e-004	8.2000e-004		8.2000e-004	8.2000e-004	0.0000	11.7392	11.7392	2.3000e-004	2.2000e-004	11.8089
NaturalGas Unmitigated	1.1900e-003	0.0108	9.0600e-003	6.0000e-005		8.2000e-004	8.2000e-004		8.2000e-004	8.2000e-004	0.0000	11.7392	11.7392	2.3000e-004	2.2000e-004	11.8089

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	34300	1.8000e-004	1.6800e-003	1.4100e-003	1.0000e-005		1.3000e-004	1.3000e-004		1.3000e-004	1.3000e-004	0.0000	1.8304	1.8304	4.0000e-005	3.0000e-005	1.8413
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
Unrefrigerated Warehouse-No Rail	185684	1.0000e-003	9.1000e-003	7.6500e-003	5.0000e-005		6.9000e-004	6.9000e-004		6.9000e-004	6.9000e-004	0.0000	9.9088	9.9088	1.9000e-004	1.8000e-004	9.9677
Total		**1.1800e-003**	**0.0108**	**9.0600e-003**	**6.0000e-005**		**8.2000e-004**	**8.2000e-004**		**8.2000e-004**	**8.2000e-004**	**0.0000**	**11.7392**	**11.7392**	**2.3000e-004**	**2.1000e-004**	**11.8089**

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	34300	1.8000e-004	1.6800e-003	1.4100e-003	1.0000e-005		1.3000e-004	1.3000e-004		1.3000e-004	1.3000e-004	0.0000	1.8304	1.8304	4.0000e-005	3.0000e-005	1.8413
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
Unrefrigerated Warehouse-No Rail	185684	1.0000e-003	9.1000e-003	7.6500e-003	5.0000e-005		6.9000e-004	6.9000e-004		6.9000e-004	6.9000e-004	0.0000	9.9088	9.9088	1.9000e-004	1.8000e-004	9.9677
Total		**1.1800e-003**	**0.0108**	**9.0600e-003**	**6.0000e-005**		**8.2000e-004**	**8.2000e-004**		**8.2000e-004**	**8.2000e-004**	**0.0000**	**11.7392**	**11.7392**	**2.3000e-004**	**2.1000e-004**	**11.8089**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
General Office Building	91900	22.1757	1.3800e-003	1.7000e-004	22.2597
Parking Lot	7840	1.8918	1.2000e-004	1.0000e-005	1.8990
Unrefrigerated Warehouse-No Rail	214322	51.7163	3.2100e-003	3.9000e-004	51.9123
Total		**75.7837**	**4.7100e-003**	**5.7000e-004**	**76.0711**

5.3 Energy by Land Use - Electricity

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
General Office Building	91900	22.1757	1.3800e-003	1.7000e-004	22.2597
Parking Lot	7840	1.8918	1.2000e-004	1.0000e-005	1.8990
Unrefrigerated Warehouse-No Rail	214322	51.7163	3.2100e-003	3.9000e-004	51.9123
Total		**75.7837**	**4.7100e-003**	**5.7000e-004**	**76.0711**

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	0.4194	2.0000e-005	2.0200e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	3.9300e-003	3.9300e-003	1.0000e-005	0.0000	4.1900e-003
Unmitigated	0.4194	2.0000e-005	2.0200e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	3.9300e-003	3.9300e-003	1.0000e-005	0.0000	4.1900e-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	0.0478					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.3714					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	1.9000e-004	2.0000e-005	2.0200e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	3.9300e-003	3.9300e-003	1.0000e-005	0.0000	4.1900e-003
Total	**0.4194**	**2.0000e-005**	**2.0200e-003**	**0.0000**		**1.0000e-005**	**1.0000e-005**		**1.0000e-005**	**1.0000e-005**	**0.0000**	**3.9300e-003**	**3.9300e-003**	**1.0000e-005**	**0.0000**	**4.1900e-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	0.0478					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.3714					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	1.9000e-004	2.0000e-005	2.0200e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	3.9300e-003	3.9300e-003	1.0000e-005	0.0000	4.1900e-003
Total	**0.4194**	**2.0000e-005**	**2.0200e-003**	**0.0000**		**1.0000e-005**	**1.0000e-005**		**1.0000e-005**	**1.0000e-005**	**0.0000**	**3.9300e-003**	**3.9300e-003**	**1.0000e-005**	**0.0000**	**4.1900e-003**

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	82.9681	0.7587	0.0184	107.4111
Unmitigated	82.9681	0.7587	0.0184	107.4111

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
General Office Building	1.77734 / 1.08934	9.0686	0.0584	1.4300e-003	10.9562
Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000
Unrefrigerated Warehouse-No Rail	21.3629 / 0	73.8995	0.7003	0.0169	96.4548
Total		**82.9681**	**0.7587**	**0.0184**	**107.4111**

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
General Office Building	1.77734 / 1.08934	9.0686	0.0584	1.4300e-003	10.9562
Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000
Unrefrigerated Warehouse-No Rail	21.3629 / 0	73.8995	0.7003	0.0169	96.4548
Total		**82.9681**	**0.7587**	**0.0184**	**107.4111**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	19.5156	1.1533	0.0000	48.3490
Unmitigated	19.5156	1.1533	0.0000	48.3490

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
General Office Building	9.3	1.8878	0.1116	0.0000	4.6770
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Unrefrigerated Warehouse-No Rail	86.84	17.6277	1.0418	0.0000	43.6720
Total		**19.5156**	**1.1533**	**0.0000**	**48.3490**

8.2 Waste by Land Use

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
General Office Building	9.3	1.8878	0.1116	0.0000	4.6770
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Unrefrigerated Warehouse-No Rail	86.84	17.6277	1.0418	0.0000	43.6720
Total		**19.5156**	**1.1533**	**0.0000**	**48.3490**

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

Summit Avenue Warehouse

San Bernardino-South Coast County, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Unrefrigerated Warehouse-No Rail	92.38	1000sqft	2.12	92,380.00	0
General Office Building	10.00	1000sqft	0.23	10,000.00	0
Parking Lot	56.00	Space	0.50	22,400.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	32
Climate Zone	10			**Operational Year**	2024
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	531.98	**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 - See SWAPE comments on "Failure to Consider Potential Cold Storage Requirements" and "Failure to Model All Proposed Land Uses."

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

Off-road Equipment - See SWAPE comment on "Unsubstantiated Changes to Construction Off-Road Equipment Unit Amounts and Usage Hours."

Grading - See SWAPE comment on "Failure to Substantiate Amount of Material Import or Export."

Off-road Equipment - See SWAPE comment on "Unsubstantiated Changes to Construction Off-Road Equipment Unit Amounts and Usage Hours."

Off-road Equipment - See SWAPE comment on "Unsubstantiated Changes to Construction Off-Road Equipment Unit Amounts and Usage Hours."

Off-road Equipment - See SWAPE comment on "Unsubstantiated Changes to Construction Off-Road Equipment Unit Amounts and Usage Hours."

Off-road Equipment - See SWAPE comment on "Unsubstantiated Changes to Construction Off-Road Equipment Unit Amounts and Usage Hours."

Trips and VMT - Consistent with the IS/MND's model.

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Architectural Coating - See SWAPE comment on "Unsubstantiated Reductions to Architectural Coating Emission Factor."

Vehicle Trips - See SWAPE comment on "Underestimated Operational Daily Vehicle Trip Rates."

Fleet Mix - Consistent with the IS/MND's model.

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	220.00	140.00
tblConstructionPhase	PhaseEndDate	7/12/2023	2/22/2023
tblConstructionPhase	PhaseEndDate	6/14/2023	1/25/2023
tblConstructionPhase	PhaseEndDate	8/10/2022	7/13/2022
tblConstructionPhase	PhaseEndDate	6/28/2023	2/8/2023
tblConstructionPhase	PhaseEndDate	8/2/2022	7/5/2022
tblConstructionPhase	PhaseStartDate	6/29/2023	2/9/2023
tblConstructionPhase	PhaseStartDate	8/11/2022	7/14/2022
tblConstructionPhase	PhaseStartDate	8/3/2022	7/6/2022
tblConstructionPhase	PhaseStartDate	6/15/2023	1/26/2023
tblConstructionPhase	PhaseStartDate	7/29/2022	7/1/2022
tblFleetMix	HHD	0.02	0.06
tblFleetMix	LDA	0.54	0.55
tblFleetMix	LDT1	0.06	0.04
tblFleetMix	LDT2	0.17	0.18
tblFleetMix	LHD1	0.03	0.02
tblFleetMix	LHD2	7.1040e-003	5.1010e-003
tblFleetMix	MCY	0.03	5.9030e-003
tblFleetMix	MDV	0.14	0.12
tblFleetMix	MH	4.8300e-003	9.4400e-004
tblFleetMix	MHD	0.01	0.02
tblFleetMix	OBUS	5.5400e-004	1.3570e-003
tblFleetMix	SBUS	9.5400e-004	8.0800e-004
tblFleetMix	UBUS	2.5100e-004	1.5650e-003

tblProjectCharacteristics	CO2IntensityFactor	390.98	531.98
tblTripsAndVMT	WorkerTripNumber	8.00	18.00
tblTripsAndVMT	WorkerTripNumber	10.00	15.00
tblTripsAndVMT	WorkerTripNumber	15.00	20.00
tblVehicleTrips	ST_TR	2.21	0.00
tblVehicleTrips	ST_TR	1.74	1.93
tblVehicleTrips	SU_TR	0.70	0.00
tblVehicleTrips	SU_TR	1.74	1.93
tblVehicleTrips	WD_TR	9.74	0.00
tblVehicleTrips	WD_TR	1.74	1.93

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	2.1063	17.0238	16.7727	0.0340	7.2503	0.7432	7.9934	3.4692	0.6858	4.1529	0.0000	3,221.2561	3,221.2561	0.7731	0.0725	3,254.5313
2023	95.7599	14.4457	16.4269	0.0337	0.6982	0.6217	1.3199	0.1881	0.5957	0.7837	0.0000	3,187.9554	3,187.9554	0.5468	0.0689	3,219.8844
Maximum	**95.7599**	**17.0238**	**16.7727**	**0.0340**	**7.2503**	**0.7432**	**7.9934**	**3.4692**	**0.6858**	**4.1529**	**0.0000**	**3,221.2561**	**3,221.2561**	**0.7731**	**0.0725**	**3,254.5313**

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	2.1063	17.0238	16.7727	0.0340	7.2503	0.7432	7.9934	3.4692	0.6858	4.1529	0.0000	3,221.2561	3,221.2561	0.7731	0.0725	3,254.5313
2023	95.7599	14.4457	16.4269	0.0337	0.6982	0.6217	1.3199	0.1881	0.5957	0.7837	0.0000	3,187.9554	3,187.9554	0.5468	0.0689	3,219.8844
Maximum	**95.7599**	**17.0238**	**16.7727**	**0.0340**	**7.2503**	**0.7432**	**7.9934**	**3.4692**	**0.6858**	**4.1529**	**0.0000**	**3,221.2561**	**3,221.2561**	**0.7731**	**0.0725**	**3,254.5313**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not 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	2.2983	1.5000e-004	0.0161	0.0000		6.0000e-005	6.0000e-005		6.0000e-005	6.0000e-005		0.0347	0.0347	9.0000e-005		0.0369
Energy	6.5000e-003	0.0591	0.0496	3.5000e-004		4.4900e-003	4.4900e-003		4.4900e-003	4.4900e-003		70.9053	70.9053	1.3600e-003	1.3000e-003	71.3267
Mobile	0.3876	1.3502	5.3480	0.0179	1.6235	0.0160	1.6395	0.4339	0.0151	0.4490		1,852.3801	1,852.3801	0.0863	0.1151	1,888.8347
Total	**2.6924**	**1.4095**	**5.4138**	**0.0182**	**1.6235**	**0.0206**	**1.6441**	**0.4339**	**0.0197**	**0.4536**		**1,923.3201**	**1,923.3201**	**0.0877**	**0.1164**	**1,960.1983**

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	2.2983	1.5000e-004	0.0161	0.0000		6.0000e-005	6.0000e-005		6.0000e-005	6.0000e-005		0.0347	0.0347	9.0000e-005		0.0369
Energy	6.5000e-003	0.0591	0.0496	3.5000e-004		4.4900e-003	4.4900e-003		4.4900e-003	4.4900e-003		70.9053	70.9053	1.3600e-003	1.3000e-003	71.3267
Mobile	0.3876	1.3502	5.3480	0.0179	1.6235	0.0160	1.6395	0.4339	0.0151	0.4490		1,852.3801	1,852.3801	0.0863	0.1151	1,888.8347
Total	**2.6924**	**1.4095**	**5.4138**	**0.0182**	**1.6235**	**0.0206**	**1.6441**	**0.4339**	**0.0197**	**0.4536**		**1,923.3201**	**1,923.3201**	**0.0877**	**0.1164**	**1,960.1983**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not 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	Site Preparation	Site Preparation	7/1/2022	7/5/2022	5	3	
2	Grading	Grading	7/6/2022	7/13/2022	5	6	
3	Construction	Building Construction	7/14/2022	1/25/2023	5	140	
4	Paving	Paving	1/26/2023	2/8/2023	5	10	
5	Painting	Architectural Coating	2/9/2023	2/22/2023	5	10	

Acres of Grading (Site Preparation Phase): 4.5

Acres of Grading (Grading Phase): 6

Acres of Paving: 0.5

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 153,570; Non-Residential Outdoor: 51,190; Striped Parking Area: 1,344 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Painting	Air Compressors	1	6.00	78	0.48
Paving	Cement and Mortar Mixers	1	8.00	9	0.56
Construction	Cranes	1	8.00	231	0.29
Construction	Forklifts	2	7.00	89	0.20
Construction	Generator Sets	1	8.00	84	0.74
Grading	Graders	1	8.00	187	0.41

Site Preparation	Graders	1	8.00	187	0.41
Paving	Pavers	1	8.00	130	0.42
Paving	Paving Equipment	1	8.00	132	0.36
Paving	Rollers	2	8.00	80	0.38
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Site Preparation	Scrapers	1	8.00	367	0.48
Construction	Tractors/Loaders/Backhoes	1	6.00	97	0.37
Grading	Tractors/Loaders/Backhoes	2	7.00	97	0.37
Paving	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Site Preparation	Tractors/Loaders/Backhoes	1	7.00	97	0.37
Construction	Welders	3	8.00	46	0.45

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
Site Preparation	3	18.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Grading	4	15.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Construction	8	51.00	20.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	20.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Painting	1	10.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Site Preparation - 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					1.5908	0.0000	1.5908	0.1718	0.0000	0.1718			0.0000			0.0000
Off-Road	1.3784	15.6673	10.0558	0.0245		0.5952	0.5952		0.5476	0.5476		2,375.156 9	2,375.156 9	0.7682		2,394.361 3
Total	**1.3784**	**15.6673**	**10.0558**	**0.0245**	**1.5908**	**0.5952**	**2.1859**	**0.1718**	**0.5476**	**0.7193**		**2,375.156 9**	**2,375.156 9**	**0.7682**		**2,394.361 3**

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	0.0762	0.0483	0.7405	1.8600e-003	0.2012	1.0500e-003	0.2023	0.0534	9.7000e-004	0.0543		187.7072	187.7072	4.9100e-003	4.7000e-003	189.2310
Total	**0.0762**	**0.0483**	**0.7405**	**1.8600e-003**	**0.2012**	**1.0500e-003**	**0.2023**	**0.0534**	**9.7000e-004**	**0.0543**		**187.7072**	**187.7072**	**4.9100e-003**	**4.7000e-003**	**189.2310**

3.2 Site Preparation - 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					1.5908	0.0000	1.5908	0.1718	0.0000	0.1718			0.0000			0.0000
Off-Road	1.3784	15.6673	10.0558	0.0245		0.5952	0.5952		0.5476	0.5476	0.0000	2,375.1569	2,375.1569	0.7682		2,394.3613
Total	**1.3784**	**15.6673**	**10.0558**	**0.0245**	**1.5908**	**0.5952**	**2.1859**	**0.1718**	**0.5476**	**0.7193**	**0.0000**	**2,375.1569**	**2,375.1569**	**0.7682**		**2,394.3613**

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	0.0762	0.0483	0.7405	1.8600e-003	0.2012	1.0500e-003	0.2023	0.0534	9.7000e-004	0.0543		187.7072	187.7072	4.9100e-003	4.7000e-003	189.2310
Total	**0.0762**	**0.0483**	**0.7405**	**1.8600e-003**	**0.2012**	**1.0500e-003**	**0.2023**	**0.0534**	**9.7000e-004**	**0.0543**		**187.7072**	**187.7072**	**4.9100e-003**	**4.7000e-003**	**189.2310**

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					7.0826	0.0000	7.0826	3.4247	0.0000	3.4247			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**	**7.0826**	**0.7423**	**7.8249**	**3.4247**	**0.6829**	**4.1076**		**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	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	0.0635	0.0402	0.6171	1.5500e-003	0.1677	8.8000e-004	0.1685	0.0445	8.1000e-004	0.0453		156.4227	156.4227	4.0900e-003	3.9200e-003	157.6925
Total	**0.0635**	**0.0402**	**0.6171**	**1.5500e-003**	**0.1677**	**8.8000e-004**	**0.1685**	**0.0445**	**8.1000e-004**	**0.0453**		**156.4227**	**156.4227**	**4.0900e-003**	**3.9200e-003**	**157.6925**

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					7.0826	0.0000	7.0826	3.4247	0.0000	3.4247			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**	**7.0826**	**0.7423**	**7.8249**	**3.4247**	**0.6829**	**4.1076**	**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	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	0.0635	0.0402	0.6171	1.5500e-003	0.1677	8.8000e-004	0.1685	0.0445	8.1000e-004	0.0453		156.4227	156.4227	4.0900e-003	3.9200e-003	157.6925
Total	**0.0635**	**0.0402**	**0.6171**	**1.5500e-003**	**0.1677**	**8.8000e-004**	**0.1685**	**0.0445**	**8.1000e-004**	**0.0453**		**156.4227**	**156.4227**	**4.0900e-003**	**3.9200e-003**	**157.6925**

3.4 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	1.8555	14.6040	14.3533	0.0250		0.7022	0.7022		0.6731	0.6731		2,289.2813	2,289.2813	0.4417		2,300.3230
Total	**1.8555**	**14.6040**	**14.3533**	**0.0250**		**0.7022**	**0.7022**		**0.6731**	**0.6731**		**2,289.2813**	**2,289.2813**	**0.4417**		**2,300.3230**

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	0.0349	0.8758	0.3214	3.7300e-003	0.1281	0.0104	0.1386	0.0369	9.9700e-003	0.0469		400.1377	400.1377	0.0108	0.0592	418.0537
Worker	0.2159	0.1368	2.0981	5.2600e-003	0.5701	2.9900e-003	0.5731	0.1512	2.7500e-003	0.1539		531.8371	531.8371	0.0139	0.0133	536.1546
Total	**0.2508**	**1.0126**	**2.4195**	**8.9900e-003**	**0.6982**	**0.0134**	**0.7116**	**0.1881**	**0.0127**	**0.2008**		**931.9748**	**931.9748**	**0.0247**	**0.0725**	**954.2083**

3.4 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	1.8555	14.6040	14.3533	0.0250		0.7022	0.7022		0.6731	0.6731	0.0000	2,289.2813	2,289.2813	0.4417		2,300.3230
Total	**1.8555**	**14.6040**	**14.3533**	**0.0250**		**0.7022**	**0.7022**		**0.6731**	**0.6731**	**0.0000**	**2,289.2813**	**2,289.2813**	**0.4417**		**2,300.3230**

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	0.0349	0.8758	0.3214	3.7300e-003	0.1281	0.0104	0.1386	0.0369	9.9700e-003	0.0469		400.1377	400.1377	0.0108	0.0592	418.0537
Worker	0.2159	0.1368	2.0981	5.2600e-003	0.5701	2.9900e-003	0.5731	0.1512	2.7500e-003	0.1539		531.8371	531.8371	0.0139	0.0133	536.1546
Total	**0.2508**	**1.0126**	**2.4195**	**8.9900e-003**	**0.6982**	**0.0134**	**0.7116**	**0.1881**	**0.0127**	**0.2008**		**931.9748**	**931.9748**	**0.0247**	**0.0725**	**954.2083**

3.4 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	1.7136	13.6239	14.2145	0.0250		0.6136	0.6136		0.5880	0.5880		2,289.5233	2,289.5233	0.4330		2,300.3479
Total	**1.7136**	**13.6239**	**14.2145**	**0.0250**		**0.6136**	**0.6136**		**0.5880**	**0.5880**		**2,289.5233**	**2,289.5233**	**0.4330**		**2,300.3479**

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	0.0234	0.7015	0.2944	3.5800e-003	0.1281	5.2700e-003	0.1334	0.0369	5.0400e-003	0.0419		383.8364	383.8364	0.0100	0.0567	400.9784
Worker	0.1993	0.1203	1.9181	5.0900e-003	0.5701	2.8100e-003	0.5729	0.1512	2.5800e-003	0.1538		514.5957	514.5957	0.0125	0.0123	518.5581
Total	**0.2227**	**0.8218**	**2.2125**	**8.6700e-003**	**0.6982**	**8.0800e-003**	**0.7063**	**0.1881**	**7.6200e-003**	**0.1957**		**898.4321**	**898.4321**	**0.0225**	**0.0689**	**919.5366**

3.4 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	1.7136	13.6239	14.2145	0.0250		0.6136	0.6136		0.5880	0.5880	0.0000	2,289.523 3	2,289.523 3	0.4330		2,300.347 9
Total	**1.7136**	**13.6239**	**14.2145**	**0.0250**		**0.6136**	**0.6136**		**0.5880**	**0.5880**	**0.0000**	**2,289.523 3**	**2,289.523 3**	**0.4330**		**2,300.347 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	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	0.0234	0.7015	0.2944	3.5800e-003	0.1281	5.2700e-003	0.1334	0.0369	5.0400e-003	0.0419		383.8364	383.8364	0.0100	0.0567	400.9784
Worker	0.1993	0.1203	1.9181	5.0900e-003	0.5701	2.8100e-003	0.5729	0.1512	2.5800e-003	0.1538		514.5957	514.5957	0.0125	0.0123	518.5581
Total	**0.2227**	**0.8218**	**2.2125**	**8.6700e-003**	**0.6982**	**8.0800e-003**	**0.7063**	**0.1881**	**7.6200e-003**	**0.1957**		**898.4321**	**898.4321**	**0.0225**	**0.0689**	**919.5366**

3.5 Paving - 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	0.8802	8.6098	11.6840	0.0179		0.4338	0.4338		0.4003	0.4003		1,709.9926	1,709.9926	0.5420		1,723.5414
Paving	0.1310					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.0112**	**8.6098**	**11.6840**	**0.0179**		**0.4338**	**0.4338**		**0.4003**	**0.4003**		**1,709.9926**	**1,709.9926**	**0.5420**		**1,723.5414**

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	0.0782	0.0472	0.7522	2.0000e-003	0.2236	1.1000e-003	0.2247	0.0593	1.0100e-003	0.0603		201.8023	201.8023	4.8800e-003	4.8000e-003	203.3561
Total	**0.0782**	**0.0472**	**0.7522**	**2.0000e-003**	**0.2236**	**1.1000e-003**	**0.2247**	**0.0593**	**1.0100e-003**	**0.0603**		**201.8023**	**201.8023**	**4.8800e-003**	**4.8000e-003**	**203.3561**

3.5 Paving - 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	0.8802	8.6098	11.6840	0.0179		0.4338	0.4338		0.4003	0.4003	0.0000	1,709.992 6	1,709.992 6	0.5420		1,723.541 4
Paving	0.1310					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.0112**	**8.6098**	**11.6840**	**0.0179**		**0.4338**	**0.4338**		**0.4003**	**0.4003**	**0.0000**	**1,709.992 6**	**1,709.992 6**	**0.5420**		**1,723.541 4**

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	0.0782	0.0472	0.7522	2.0000e-003	0.2236	1.1000e-003	0.2247	0.0593	1.0100e-003	0.0603		201.8023	201.8023	4.8800e-003	4.8000e-003	203.3561
Total	**0.0782**	**0.0472**	**0.7522**	**2.0000e-003**	**0.2236**	**1.1000e-003**	**0.2247**	**0.0593**	**1.0100e-003**	**0.0603**		**201.8023**	**201.8023**	**4.8800e-003**	**4.8000e-003**	**203.3561**

3.6 Painting - 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					
Archit. Coating	95.5292					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.1917	1.3030	1.8111	2.9700e-003		0.0708	0.0708		0.0708	0.0708		281.4481	281.4481	0.0168		281.8690
Total	**95.7209**	**1.3030**	**1.8111**	**2.9700e-003**		**0.0708**	**0.0708**		**0.0708**	**0.0708**		**281.4481**	**281.4481**	**0.0168**		**281.8690**

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	0.0391	0.0236	0.3761	1.0000e-003	0.1118	5.5000e-004	0.1123	0.0296	5.1000e-004	0.0302		100.9011	100.9011	2.4400e-003	2.4000e-003	101.6781
Total	**0.0391**	**0.0236**	**0.3761**	**1.0000e-003**	**0.1118**	**5.5000e-004**	**0.1123**	**0.0296**	**5.1000e-004**	**0.0302**		**100.9011**	**100.9011**	**2.4400e-003**	**2.4000e-003**	**101.6781**

3.6 Painting - 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					
Archit. Coating	95.5292					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.1917	1.3030	1.8111	2.9700e-003		0.0708	0.0708		0.0708	0.0708	0.0000	281.4481	281.4481	0.0168		281.8690
Total	**95.7209**	**1.3030**	**1.8111**	**2.9700e-003**		**0.0708**	**0.0708**		**0.0708**	**0.0708**	**0.0000**	**281.4481**	**281.4481**	**0.0168**		**281.8690**

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	0.0391	0.0236	0.3761	1.0000e-003	0.1118	5.5000e-004	0.1123	0.0296	5.1000e-004	0.0302		100.9011	100.9011	2.4400e-003	2.4000e-003	101.6781
Total	**0.0391**	**0.0236**	**0.3761**	**1.0000e-003**	**0.1118**	**5.5000e-004**	**0.1123**	**0.0296**	**5.1000e-004**	**0.0302**		**100.9011**	**100.9011**	**2.4400e-003**	**2.4000e-003**	**101.6781**

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	0.3876	1.3502	5.3480	0.0179	1.6235	0.0160	1.6395	0.4339	0.0151	0.4490		1,852.380 1	1,852.380 1	0.0863	0.1151	1,888.834 7
Unmitigated	0.3876	1.3502	5.3480	0.0179	1.6235	0.0160	1.6395	0.4339	0.0151	0.4490		1,852.380 1	1,852.380 1	0.0863	0.1151	1,888.834 7

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
General Office Building	0.00	0.00	0.00		
Parking Lot	0.00	0.00	0.00		
Unrefrigerated Warehouse-No Rail	178.00	178.00	178.00	762,848	762,848
Total	178.00	178.00	178.00	762,848	762,848

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
Unrefrigerated Warehouse-No Rail	16.60	8.40	6.90	59.00	0.00	41.00	92	5	3

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
General Office Building	0.540566	0.056059	0.172680	0.136494	0.026304	0.007104	0.011680	0.017449	0.000554	0.000251	0.025076	0.000954	0.004830
Parking Lot	0.540566	0.056059	0.172680	0.136494	0.026304	0.007104	0.011680	0.017449	0.000554	0.000251	0.025076	0.000954	0.004830
Unrefrigerated Warehouse-No Rail	0.553113	0.036408	0.180286	0.116335	0.016165	0.005101	0.018218	0.063797	0.001357	0.001565	0.005903	0.000808	0.000944

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	6.5000e-003	0.0591	0.0496	3.5000e-004		4.4900e-003	4.4900e-003		4.4900e-003	4.4900e-003		70.9053	70.9053	1.3600e-003	1.3000e-003	71.3267
NaturalGas Unmitigated	6.5000e-003	0.0591	0.0496	3.5000e-004		4.4900e-003	4.4900e-003		4.4900e-003	4.4900e-003		70.9053	70.9053	1.3600e-003	1.3000e-003	71.3267

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	93.9726	1.0100e-003	9.2100e-003	7.7400e-003	6.0000e-005		7.0000e-004	7.0000e-004		7.0000e-004	7.0000e-004		11.0556	11.0556	2.1000e-004	2.0000e-004	11.1213
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
Unrefrigerated Warehouse-No Rail	508.723	5.4900e-003	0.0499	0.0419	3.0000e-004		3.7900e-003	3.7900e-003		3.7900e-003	3.7900e-003		59.8497	59.8497	1.1500e-003	1.1000e-003	60.2054
Total		**6.5000e-003**	**0.0591**	**0.0496**	**3.6000e-004**		**4.4900e-003**	**4.4900e-003**		**4.4900e-003**	**4.4900e-003**		**70.9053**	**70.9053**	**1.3600e-003**	**1.3000e-003**	**71.3267**

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	0.0939726	1.0100e-003	9.2100e-003	7.7400e-003	6.0000e-005		7.0000e-004	7.0000e-004		7.0000e-004	7.0000e-004		11.0556	11.0556	2.1000e-004	2.0000e-004	11.1213
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
Unrefrigerated Warehouse-No Rail	0.508723	5.4900e-003	0.0499	0.0419	3.0000e-004		3.7900e-003	3.7900e-003		3.7900e-003	3.7900e-003		59.8497	59.8497	1.1500e-003	1.1000e-003	60.2054
Total		**6.5000e-003**	**0.0591**	**0.0496**	**3.6000e-004**		**4.4900e-003**	**4.4900e-003**		**4.4900e-003**	**4.4900e-003**		**70.9053**	**70.9053**	**1.3600e-003**	**1.3000e-003**	**71.3267**

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	2.2983	1.5000e-004	0.0161	0.0000		6.0000e-005	6.0000e-005		6.0000e-005	6.0000e-005		0.0347	0.0347	9.0000e-005		0.0369
Unmitigated	2.2983	1.5000e-004	0.0161	0.0000		6.0000e-005	6.0000e-005		6.0000e-005	6.0000e-005		0.0347	0.0347	9.0000e-005		0.0369

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	0.2617					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	2.0351					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	1.4900e-003	1.5000e-004	0.0161	0.0000		6.0000e-005	6.0000e-005		6.0000e-005	6.0000e-005		0.0347	0.0347	9.0000e-005		0.0369
Total	**2.2983**	**1.5000e-004**	**0.0161**	**0.0000**		**6.0000e-005**	**6.0000e-005**		**6.0000e-005**	**6.0000e-005**		**0.0347**	**0.0347**	**9.0000e-005**		**0.0369**

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	0.2617					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	2.0351					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	1.4900e-003	1.5000e-004	0.0161	0.0000		6.0000e-005	6.0000e-005		6.0000e-005	6.0000e-005		0.0347	0.0347	9.0000e-005		0.0369
Total	**2.2983**	**1.5000e-004**	**0.0161**	**0.0000**		**6.0000e-005**	**6.0000e-005**		**6.0000e-005**	**6.0000e-005**		**0.0347**	**0.0347**	**9.0000e-005**		**0.0369**

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 Not Applied

Summit Avenue Warehouse

San Bernardino-South Coast County, Winter

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Unrefrigerated Warehouse-No Rail	92.38	1000sqft	2.12	92,380.00	0
General Office Building	10.00	1000sqft	0.23	10,000.00	0
Parking Lot	56.00	Space	0.50	22,400.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	32
Climate Zone	10			**Operational Year**	2024
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	531.98	**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 - See SWAPE comments on "Failure to Consider Potential Cold Storage Requirements" and "Failure to Model All Proposed Land Uses."

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

Off-road Equipment - See SWAPE comment on "Unsubstantiated Changes to Construction Off-Road Equipment Unit Amounts and Usage Hours."

Grading - See SWAPE comment on "Failure to Substantiate Amount of Material Import or Export."

Off-road Equipment - See SWAPE comment on "Unsubstantiated Changes to Construction Off-Road Equipment Unit Amounts and Usage Hours."

Off-road Equipment - See SWAPE comment on "Unsubstantiated Changes to Construction Off-Road Equipment Unit Amounts and Usage Hours."

Off-road Equipment - See SWAPE comment on "Unsubstantiated Changes to Construction Off-Road Equipment Unit Amounts and Usage Hours."

Off-road Equipment - See SWAPE comment on "Unsubstantiated Changes to Construction Off-Road Equipment Unit Amounts and Usage Hours."

Trips and VMT - Consistent with the IS/MND's model.

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Architectural Coating - See SWAPE comment on "Unsubstantiated Reductions to Architectural Coating Emission Factor."

Vehicle Trips - See SWAPE comment on "Underestimated Operational Daily Vehicle Trip Rates."

Fleet Mix - Consistent with the IS/MND's model.

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	220.00	140.00
tblConstructionPhase	PhaseEndDate	7/12/2023	2/22/2023
tblConstructionPhase	PhaseEndDate	6/14/2023	1/25/2023
tblConstructionPhase	PhaseEndDate	8/10/2022	7/13/2022
tblConstructionPhase	PhaseEndDate	6/28/2023	2/8/2023
tblConstructionPhase	PhaseEndDate	8/2/2022	7/5/2022
tblConstructionPhase	PhaseStartDate	6/29/2023	2/9/2023
tblConstructionPhase	PhaseStartDate	8/11/2022	7/14/2022
tblConstructionPhase	PhaseStartDate	8/3/2022	7/6/2022
tblConstructionPhase	PhaseStartDate	6/15/2023	1/26/2023
tblConstructionPhase	PhaseStartDate	7/29/2022	7/1/2022
tblFleetMix	HHD	0.02	0.06
tblFleetMix	LDA	0.54	0.55
tblFleetMix	LDT1	0.06	0.04
tblFleetMix	LDT2	0.17	0.18
tblFleetMix	LHD1	0.03	0.02
tblFleetMix	LHD2	7.1040e-003	5.1010e-003
tblFleetMix	MCY	0.03	5.9030e-003
tblFleetMix	MDV	0.14	0.12
tblFleetMix	MH	4.8300e-003	9.4400e-004
tblFleetMix	MHD	0.01	0.02
tblFleetMix	OBUS	5.5400e-004	1.3570e-003
tblFleetMix	SBUS	9.5400e-004	8.0800e-004
tblFleetMix	UBUS	2.5100e-004	1.5650e-003

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

tblProjectCharacteristics	CO2IntensityFactor	390.98	531.98
tblTripsAndVMT	WorkerTripNumber	8.00	18.00
tblTripsAndVMT	WorkerTripNumber	10.00	15.00
tblTripsAndVMT	WorkerTripNumber	15.00	20.00
tblVehicleTrips	ST_TR	2.21	0.00
tblVehicleTrips	ST_TR	1.74	1.93
tblVehicleTrips	SU_TR	0.70	0.00
tblVehicleTrips	SU_TR	1.74	1.93
tblVehicleTrips	WD_TR	9.74	0.00
tblVehicleTrips	WD_TR	1.74	1.93

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	2.0964	17.0259	16.4094	0.0335	7.2503	0.7432	7.9934	3.4692	0.6859	4.1529	0.0000	3,171.5442	3,171.5442	0.7731	0.0731	3,204.9763
2023	95.7585	14.4913	16.0966	0.0332	0.6982	0.6217	1.3199	0.1881	0.5957	0.7838	0.0000	3,140.5039	3,140.5039	0.5468	0.0695	3,172.6011
Maximum	**95.7585**	**17.0259**	**16.4094**	**0.0335**	**7.2503**	**0.7432**	**7.9934**	**3.4692**	**0.6859**	**4.1529**	**0.0000**	**3,171.5442**	**3,171.5442**	**0.7731**	**0.0731**	**3,204.9763**

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	2.0964	17.0259	16.4094	0.0335	7.2503	0.7432	7.9934	3.4692	0.6859	4.1529	0.0000	3,171.5442	3,171.5442	0.7731	0.0731	3,204.9763
2023	95.7585	14.4913	16.0966	0.0332	0.6982	0.6217	1.3199	0.1881	0.5957	0.7838	0.0000	3,140.5039	3,140.5039	0.5468	0.0695	3,172.6011
Maximum	**95.7585**	**17.0259**	**16.4094**	**0.0335**	**7.2503**	**0.7432**	**7.9934**	**3.4692**	**0.6859**	**4.1529**	**0.0000**	**3,171.5442**	**3,171.5442**	**0.7731**	**0.0731**	**3,204.9763**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not 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	2.2983	1.5000e-004	0.0161	0.0000		6.0000e-005	6.0000e-005		6.0000e-005	6.0000e-005		0.0347	0.0347	9.0000e-005		0.0369
Energy	6.5000e-003	0.0591	0.0496	3.5000e-004		4.4900e-003	4.4900e-003		4.4900e-003	4.4900e-003		70.9053	70.9053	1.3600e-003	1.3000e-003	71.3267
Mobile	0.3338	1.4254	4.6638	0.0168	1.6235	0.0161	1.6395	0.4339	0.0151	0.4490		1,738.3159	1,738.3159	0.0871	0.1164	1,775.1732
Total	**2.6385**	**1.4847**	**4.7295**	**0.0171**	**1.6235**	**0.0206**	**1.6441**	**0.4339**	**0.0197**	**0.4536**		**1,809.2559**	**1,809.2559**	**0.0885**	**0.1177**	**1,846.5368**

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	2.2983	1.5000e-004	0.0161	0.0000		6.0000e-005	6.0000e-005		6.0000e-005	6.0000e-005		0.0347	0.0347	9.0000e-005		0.0369
Energy	6.5000e-003	0.0591	0.0496	3.5000e-004		4.4900e-003	4.4900e-003		4.4900e-003	4.4900e-003		70.9053	70.9053	1.3600e-003	1.3000e-003	71.3267
Mobile	0.3338	1.4254	4.6638	0.0168	1.6235	0.0161	1.6395	0.4339	0.0151	0.4490		1,738.3159	1,738.3159	0.0871	0.1164	1,775.1732
Total	**2.6385**	**1.4847**	**4.7295**	**0.0171**	**1.6235**	**0.0206**	**1.6441**	**0.4339**	**0.0197**	**0.4536**		**1,809.2559**	**1,809.2559**	**0.0885**	**0.1177**	**1,846.5368**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not 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	Site Preparation	Site Preparation	7/1/2022	7/5/2022	5	3	
2	Grading	Grading	7/6/2022	7/13/2022	5	6	
3	Construction	Building Construction	7/14/2022	1/25/2023	5	140	
4	Paving	Paving	1/26/2023	2/8/2023	5	10	
5	Painting	Architectural Coating	2/9/2023	2/22/2023	5	10	

Acres of Grading (Site Preparation Phase): 4.5

Acres of Grading (Grading Phase): 6

Acres of Paving: 0.5

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 153,570; Non-Residential Outdoor: 51,190; Striped Parking Area: 1,344 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Painting	Air Compressors	1	6.00	78	0.48
Paving	Cement and Mortar Mixers	1	8.00	9	0.56
Construction	Cranes	1	8.00	231	0.29
Construction	Forklifts	2	7.00	89	0.20
Construction	Generator Sets	1	8.00	84	0.74
Grading	Graders	1	8.00	187	0.41

Site Preparation	Graders	1	8.00	187	0.41
Paving	Pavers	1	8.00	130	0.42
Paving	Paving Equipment	1	8.00	132	0.36
Paving	Rollers	2	8.00	80	0.38
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Site Preparation	Scrapers	1	8.00	367	0.48
Construction	Tractors/Loaders/Backhoes	1	6.00	97	0.37
Grading	Tractors/Loaders/Backhoes	2	7.00	97	0.37
Paving	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Site Preparation	Tractors/Loaders/Backhoes	1	7.00	97	0.37
Construction	Welders	3	8.00	46	0.45

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
Site Preparation	3	18.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Grading	4	15.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Construction	8	51.00	20.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	20.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Painting	1	10.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Site Preparation - 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					1.5908	0.0000	1.5908	0.1718	0.0000	0.1718			0.0000			0.0000
Off-Road	1.3784	15.6673	10.0558	0.0245		0.5952	0.5952		0.5476	0.5476		2,375.156 9	2,375.156 9	0.7682		2,394.361 3
Total	**1.3784**	**15.6673**	**10.0558**	**0.0245**	**1.5908**	**0.5952**	**2.1859**	**0.1718**	**0.5476**	**0.7193**		**2,375.156 9**	**2,375.156 9**	**0.7682**		**2,394.361 3**

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	0.0732	0.0508	0.6083	1.6800e-003	0.2012	1.0500e-003	0.2023	0.0534	9.7000e-004	0.0543		170.0061	170.0061	4.9000e-003	4.8500e-003	171.5751
Total	**0.0732**	**0.0508**	**0.6083**	**1.6800e-003**	**0.2012**	**1.0500e-003**	**0.2023**	**0.0534**	**9.7000e-004**	**0.0543**		**170.0061**	**170.0061**	**4.9000e-003**	**4.8500e-003**	**171.5751**

3.2 Site Preparation - 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					1.5908	0.0000	1.5908	0.1718	0.0000	0.1718			0.0000			0.0000
Off-Road	1.3784	15.6673	10.0558	0.0245		0.5952	0.5952		0.5476	0.5476	0.0000	2,375.1569	2,375.1569	0.7682		2,394.3613
Total	**1.3784**	**15.6673**	**10.0558**	**0.0245**	**1.5908**	**0.5952**	**2.1859**	**0.1718**	**0.5476**	**0.7193**	**0.0000**	**2,375.1569**	**2,375.1569**	**0.7682**		**2,394.3613**

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	0.0732	0.0508	0.6083	1.6800e-003	0.2012	1.0500e-003	0.2023	0.0534	9.7000e-004	0.0543		170.0061	170.0061	4.9000e-003	4.8500e-003	171.5751
Total	**0.0732**	**0.0508**	**0.6083**	**1.6800e-003**	**0.2012**	**1.0500e-003**	**0.2023**	**0.0534**	**9.7000e-004**	**0.0543**		**170.0061**	**170.0061**	**4.9000e-003**	**4.8500e-003**	**171.5751**

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					7.0826	0.0000	7.0826	3.4247	0.0000	3.4247			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**	**7.0826**	**0.7423**	**7.8249**	**3.4247**	**0.6829**	**4.1076**		**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	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	0.0610	0.0423	0.5069	1.4000e-003	0.1677	8.8000e-004	0.1685	0.0445	8.1000e-004	0.0453		141.6717	141.6717	4.0800e-003	4.0400e-003	142.9792
Total	**0.0610**	**0.0423**	**0.5069**	**1.4000e-003**	**0.1677**	**8.8000e-004**	**0.1685**	**0.0445**	**8.1000e-004**	**0.0453**		**141.6717**	**141.6717**	**4.0800e-003**	**4.0400e-003**	**142.9792**

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					7.0826	0.0000	7.0826	3.4247	0.0000	3.4247			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**	**7.0826**	**0.7423**	**7.8249**	**3.4247**	**0.6829**	**4.1076**	**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	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	0.0610	0.0423	0.5069	1.4000e-003	0.1677	8.8000e-004	0.1685	0.0445	8.1000e-004	0.0453		141.6717	141.6717	4.0800e-003	4.0400e-003	142.9792
Total	**0.0610**	**0.0423**	**0.5069**	**1.4000e-003**	**0.1677**	**8.8000e-004**	**0.1685**	**0.0445**	**8.1000e-004**	**0.0453**		**141.6717**	**141.6717**	**4.0800e-003**	**4.0400e-003**	**142.9792**

3.4 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	1.8555	14.6040	14.3533	0.0250		0.7022	0.7022		0.6731	0.6731		2,289.2813	2,289.2813	0.4417		2,300.3230
Total	**1.8555**	**14.6040**	**14.3533**	**0.0250**		**0.7022**	**0.7022**		**0.6731**	**0.6731**		**2,289.2813**	**2,289.2813**	**0.4417**		**2,300.3230**

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	0.0335	0.9194	0.3327	3.7400e-003	0.1281	0.0105	0.1386	0.0369	0.0100	0.0469		400.5790	400.5790	0.0108	0.0593	418.5240
Worker	0.2074	0.1438	1.7234	4.7700e-003	0.5701	2.9900e-003	0.5731	0.1512	2.7500e-003	0.1539		481.6839	481.6839	0.0139	0.0138	486.1294
Total	**0.2409**	**1.0632**	**2.0562**	**8.5100e-003**	**0.6982**	**0.0134**	**0.7116**	**0.1881**	**0.0128**	**0.2008**		**882.2629**	**882.2629**	**0.0246**	**0.0731**	**904.6534**

3.4 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	1.8555	14.6040	14.3533	0.0250		0.7022	0.7022		0.6731	0.6731	0.0000	2,289.2813	2,289.2813	0.4417		2,300.3230
Total	**1.8555**	**14.6040**	**14.3533**	**0.0250**		**0.7022**	**0.7022**		**0.6731**	**0.6731**	**0.0000**	**2,289.2813**	**2,289.2813**	**0.4417**		**2,300.3230**

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	0.0335	0.9194	0.3327	3.7400e-003	0.1281	0.0105	0.1386	0.0369	0.0100	0.0469		400.5790	400.5790	0.0108	0.0593	418.5240
Worker	0.2074	0.1438	1.7234	4.7700e-003	0.5701	2.9900e-003	0.5731	0.1512	2.7500e-003	0.1539		481.6839	481.6839	0.0139	0.0138	486.1294
Total	**0.2409**	**1.0632**	**2.0562**	**8.5100e-003**	**0.6982**	**0.0134**	**0.7116**	**0.1881**	**0.0128**	**0.2008**		**882.2629**	**882.2629**	**0.0246**	**0.0731**	**904.6534**

3.4 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	1.7136	13.6239	14.2145	0.0250		0.6136	0.6136		0.5880	0.5880		2,289.5233	2,289.5233	0.4330		2,300.3479
Total	**1.7136**	**13.6239**	**14.2145**	**0.0250**		**0.6136**	**0.6136**		**0.5880**	**0.5880**		**2,289.5233**	**2,289.5233**	**0.4330**		**2,300.3479**

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	0.0218	0.7410	0.3035	3.5900e-003	0.1281	5.2900e-003	0.1334	0.0369	5.0600e-003	0.0420		384.7672	384.7672	9.9500e-003	0.0569	401.9597
Worker	0.1920	0.1264	1.5787	4.6100e-003	0.5701	2.8100e-003	0.5729	0.1512	2.5800e-003	0.1538		466.2133	466.2133	0.0125	0.0127	470.2935
Total	**0.2138**	**0.8674**	**1.8821**	**8.2000e-003**	**0.6982**	**8.1000e-003**	**0.7063**	**0.1881**	**7.6400e-003**	**0.1957**		**850.9805**	**850.9805**	**0.0224**	**0.0695**	**872.2532**

3.4 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	1.7136	13.6239	14.2145	0.0250		0.6136	0.6136		0.5880	0.5880	0.0000	2,289.5233	2,289.5233	0.4330		2,300.3479
Total	**1.7136**	**13.6239**	**14.2145**	**0.0250**		**0.6136**	**0.6136**		**0.5880**	**0.5880**	**0.0000**	**2,289.5233**	**2,289.5233**	**0.4330**		**2,300.3479**

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	0.0218	0.7410	0.3035	3.5900e-003	0.1281	5.2900e-003	0.1334	0.0369	5.0600e-003	0.0420		384.7672	384.7672	9.9500e-003	0.0569	401.9597
Worker	0.1920	0.1264	1.5787	4.6100e-003	0.5701	2.8100e-003	0.5729	0.1512	2.5800e-003	0.1538		466.2133	466.2133	0.0125	0.0127	470.2935
Total	**0.2138**	**0.8674**	**1.8821**	**8.2000e-003**	**0.6982**	**8.1000e-003**	**0.7063**	**0.1881**	**7.6400e-003**	**0.1957**		**850.9805**	**850.9805**	**0.0224**	**0.0695**	**872.2532**

3.5 Paving - 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	0.8802	8.6098	11.6840	0.0179		0.4338	0.4338		0.4003	0.4003		1,709.9926	1,709.9926	0.5420		1,723.5414
Paving	0.1310					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.0112**	**8.6098**	**11.6840**	**0.0179**		**0.4338**	**0.4338**		**0.4003**	**0.4003**		**1,709.9926**	**1,709.9926**	**0.5420**		**1,723.5414**

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	0.0753	0.0496	0.6191	1.8100e-003	0.2236	1.1000e-003	0.2247	0.0593	1.0100e-003	0.0603		182.8288	182.8288	4.8900e-003	4.9600e-003	184.4288
Total	**0.0753**	**0.0496**	**0.6191**	**1.8100e-003**	**0.2236**	**1.1000e-003**	**0.2247**	**0.0593**	**1.0100e-003**	**0.0603**		**182.8288**	**182.8288**	**4.8900e-003**	**4.9600e-003**	**184.4288**

3.5 Paving - 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	0.8802	8.6098	11.6840	0.0179		0.4338	0.4338		0.4003	0.4003	0.0000	1,709.992 6	1,709.992 6	0.5420		1,723.541 4
Paving	0.1310					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.0112**	**8.6098**	**11.6840**	**0.0179**		**0.4338**	**0.4338**		**0.4003**	**0.4003**	**0.0000**	**1,709.992 6**	**1,709.992 6**	**0.5420**		**1,723.541 4**

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	0.0753	0.0496	0.6191	1.8100e-003	0.2236	1.1000e-003	0.2247	0.0593	1.0100e-003	0.0603		182.8288	182.8288	4.8900e-003	4.9600e-003	184.4288
Total	**0.0753**	**0.0496**	**0.6191**	**1.8100e-003**	**0.2236**	**1.1000e-003**	**0.2247**	**0.0593**	**1.0100e-003**	**0.0603**		**182.8288**	**182.8288**	**4.8900e-003**	**4.9600e-003**	**184.4288**

3.6 Painting - 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					
Archit. Coating	95.5292					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.1917	1.3030	1.8111	2.9700e-003		0.0708	0.0708		0.0708	0.0708		281.4481	281.4481	0.0168		281.8690
Total	**95.7209**	**1.3030**	**1.8111**	**2.9700e-003**		**0.0708**	**0.0708**		**0.0708**	**0.0708**		**281.4481**	**281.4481**	**0.0168**		**281.8690**

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	0.0376	0.0248	0.3096	9.0000e-004	0.1118	5.5000e-004	0.1123	0.0296	5.1000e-004	0.0302		91.4144	91.4144	2.4400e-003	2.4800e-003	92.2144
Total	**0.0376**	**0.0248**	**0.3096**	**9.0000e-004**	**0.1118**	**5.5000e-004**	**0.1123**	**0.0296**	**5.1000e-004**	**0.0302**		**91.4144**	**91.4144**	**2.4400e-003**	**2.4800e-003**	**92.2144**

3.6 Painting - 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					
Archit. Coating	95.5292					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.1917	1.3030	1.8111	2.9700e-003		0.0708	0.0708		0.0708	0.0708	0.0000	281.4481	281.4481	0.0168		281.8690
Total	**95.7209**	**1.3030**	**1.8111**	**2.9700e-003**		**0.0708**	**0.0708**		**0.0708**	**0.0708**	**0.0000**	**281.4481**	**281.4481**	**0.0168**		**281.8690**

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	0.0376	0.0248	0.3096	9.0000e-004	0.1118	5.5000e-004	0.1123	0.0296	5.1000e-004	0.0302		91.4144	91.4144	2.4400e-003	2.4800e-003	92.2144
Total	**0.0376**	**0.0248**	**0.3096**	**9.0000e-004**	**0.1118**	**5.5000e-004**	**0.1123**	**0.0296**	**5.1000e-004**	**0.0302**		**91.4144**	**91.4144**	**2.4400e-003**	**2.4800e-003**	**92.2144**

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	0.3338	1.4254	4.6638	0.0168	1.6235	0.0161	1.6395	0.4339	0.0151	0.4490		1,738.3159	1,738.3159	0.0871	0.1164	1,775.1732
Unmitigated	0.3338	1.4254	4.6638	0.0168	1.6235	0.0161	1.6395	0.4339	0.0151	0.4490		1,738.3159	1,738.3159	0.0871	0.1164	1,775.1732

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
General Office Building	0.00	0.00	0.00		
Parking Lot	0.00	0.00	0.00		
Unrefrigerated Warehouse-No Rail	178.00	178.00	178.00	762,848	762,848
Total	178.00	178.00	178.00	762,848	762,848

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
Unrefrigerated Warehouse-No Rail	16.60	8.40	6.90	59.00	0.00	41.00	92	5	3

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
General Office Building	0.540566	0.056059	0.172680	0.136494	0.026304	0.007104	0.011680	0.017449	0.000554	0.000251	0.025076	0.000954	0.004830
Parking Lot	0.540566	0.056059	0.172680	0.136494	0.026304	0.007104	0.011680	0.017449	0.000554	0.000251	0.025076	0.000954	0.004830
Unrefrigerated Warehouse-No Rail	0.553113	0.036408	0.180286	0.116335	0.016165	0.005101	0.018218	0.063797	0.001357	0.001565	0.005903	0.000808	0.000944

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	6.5000e-003	0.0591	0.0496	3.5000e-004		4.4900e-003	4.4900e-003		4.4900e-003	4.4900e-003		70.9053	70.9053	1.3600e-003	1.3000e-003	71.3267
NaturalGas Unmitigated	6.5000e-003	0.0591	0.0496	3.5000e-004		4.4900e-003	4.4900e-003		4.4900e-003	4.4900e-003		70.9053	70.9053	1.3600e-003	1.3000e-003	71.3267

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	93.9726	1.0100e-003	9.2100e-003	7.7400e-003	6.0000e-005		7.0000e-004	7.0000e-004		7.0000e-004	7.0000e-004		11.0556	11.0556	2.1000e-004	2.0000e-004	11.1213
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
Unrefrigerated Warehouse-No Rail	508.723	5.4900e-003	0.0499	0.0419	3.0000e-004		3.7900e-003	3.7900e-003		3.7900e-003	3.7900e-003		59.8497	59.8497	1.1500e-003	1.1000e-003	60.2054
Total		**6.5000e-003**	**0.0591**	**0.0496**	**3.6000e-004**		**4.4900e-003**	**4.4900e-003**		**4.4900e-003**	**4.4900e-003**		**70.9053**	**70.9053**	**1.3600e-003**	**1.3000e-003**	**71.3267**

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	0.0939726	1.0100e-003	9.2100e-003	7.7400e-003	6.0000e-005		7.0000e-004	7.0000e-004		7.0000e-004	7.0000e-004		11.0556	11.0556	2.1000e-004	2.0000e-004	11.1213
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
Unrefrigerated Warehouse-No Rail	0.508723	5.4900e-003	0.0499	0.0419	3.0000e-004		3.7900e-003	3.7900e-003		3.7900e-003	3.7900e-003		59.8497	59.8497	1.1500e-003	1.1000e-003	60.2054
Total		**6.5000e-003**	**0.0591**	**0.0496**	**3.6000e-004**		**4.4900e-003**	**4.4900e-003**		**4.4900e-003**	**4.4900e-003**		**70.9053**	**70.9053**	**1.3600e-003**	**1.3000e-003**	**71.3267**

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	2.2983	1.5000e-004	0.0161	0.0000		6.0000e-005	6.0000e-005		6.0000e-005	6.0000e-005		0.0347	0.0347	9.0000e-005		0.0369
Unmitigated	2.2983	1.5000e-004	0.0161	0.0000		6.0000e-005	6.0000e-005		6.0000e-005	6.0000e-005		0.0347	0.0347	9.0000e-005		0.0369

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	0.2617					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	2.0351					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	1.4900e-003	1.5000e-004	0.0161	0.0000		6.0000e-005	6.0000e-005		6.0000e-005	6.0000e-005		0.0347	0.0347	9.0000e-005		0.0369
Total	**2.2983**	**1.5000e-004**	**0.0161**	**0.0000**		**6.0000e-005**	**6.0000e-005**		**6.0000e-005**	**6.0000e-005**		**0.0347**	**0.0347**	**9.0000e-005**		**0.0369**

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	0.2617					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	2.0351					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	1.4900e-003	1.5000e-004	0.0161	0.0000		6.0000e-005	6.0000e-005		6.0000e-005	6.0000e-005		0.0347	0.0347	9.0000e-005		0.0369
Total	**2.2983**	**1.5000e-004**	**0.0161**	**0.0000**		**6.0000e-005**	**6.0000e-005**		**6.0000e-005**	**6.0000e-005**		**0.0347**	**0.0347**	**9.0000e-005**		**0.0369**

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

Construction

2022		Total	
Annual Emissions (tons/year)	0.0467	Total DPM (lbs)	49.39747945
Daily Emissions (lbs/day)	0.255890411	Total DPM (g)	22406.69668
Construction Duration (days)	184	Emission Rate (g/s)	0.001098885
Total DPM (lbs)	47.08383562	Release Height (meters)	3
Total DPM (g)	21357.22784	Total Acreage	4.49
Start Date	7/1/2022	Max Horizontal (meters)	190.63
End Date	1/1/2023	Min Horizontal (meters)	95.32
Construction Days	184	Initial Vertical Dimension (meters)	1.5
2023		Setting	Urban
Annual Emissions (tons/year)	0.00812	Population	212,704
Daily Emissions (lbs/day)	0.044493151	Start Date	7/1/2022
Construction Duration (days)	52	End Date	2/22/2023
Total DPM (lbs)	2.313643836	Total Construction Days	236
Total DPM (g)	1049.468844	Total Years of Construction	0.65
Start Date	1/1/2023	Total Years of Operation	29.35
End Date	2/22/2023		
Construction Days	52		

Operation

Emission Rate	
Annual Emissions (tons/year)	0.00302
Daily Emissions (lbs/day)	0.016547945
Total DPM (lbs)	6.04
Emission Rate (g/s)	0.000086877
Release Height (meters)	3
Total Acreage	4.49
Max Horizontal (meters)	190.63
Min Horizontal (meters)	95.32
Initial Vertical Dimension (meters)	1.5
Setting	Urban
Population	212,704

```
Start date and time  07/19/22 12:26:39

                                AERSCREEN 21112

Summit Avenue Warehouse

            Summit Avenue Warehouse - Construction

         -----------------  DATA ENTRY VALIDATION  -----------------
                        METRIC              ENGLISH
 ** AREADATA **  ---------------     ----------------

 Emission Rate:    0.110E-02 g/s         0.872E-02 lb/hr
 Area Height:           3.00 meters           9.84 feet
 Area Source Length:  190.63 meters         625.43 feet
 Area Source Width:    95.32 meters         312.73 feet
 Vertical Dimension:    1.50 meters           4.92 feet
 Model Mode:           URBAN
 Population:          212704
 Dist to Ambient Air:           1.0 meters             3. feet

 ** BUILDING DATA **
```

No Building Downwash Parameters

** TERRAIN DATA **

No Terrain Elevations

Source Base Elevation: 0.0 meters   0.0 feet

Probe distance: 5000. meters   16404. feet

No flagpole receptors

No discrete receptors used

** FUMIGATION DATA **

No fumigation requested

** METEOROLOGY DATA **

Min/Max Temperature: 250.0 / 310.0 K   -9.7 / 98.3 Deg F

Minimum Wind Speed: 0.5 m/s

Anemometer Height: 10.000 meters

Dominant Surface Profile: Urban

Dominant Climate Type: Average Moisture

Surface friction velocity (u*): not adjusted

DEBUG OPTION ON

AERSCREEN output file:

2022.07.19_SummitAvenueWarehouse_AERSCREEN_Construction.out

*** AERSCREEN Run is Ready to Begin

No terrain used, AERMAP will not be run

****

SURFACE CHARACTERISTICS & MAKEMET

Obtaining surface characteristics...

```
Using AERMET seasonal surface characteristics for Urban with Average Moisture

Season            Albedo     Bo       zo

Winter             0.35     1.50     1.000

Spring             0.14     1.00     1.000

Summer             0.16     2.00     1.000

Autumn             0.18     2.00     1.000


Creating met files aerscreen_01_01.sfc & aerscreen_01_01.pfl


Creating met files aerscreen_02_01.sfc & aerscreen_02_01.pfl


Creating met files aerscreen_03_01.sfc & aerscreen_03_01.pfl


Creating met files aerscreen_04_01.sfc & aerscreen_04_01.pfl


Buildings and/or terrain present or rectangular area source, skipping probe


FLOWSECTOR   started 07/19/22 12:29:53
 ********************************************


  Running AERMOD

 Processing Winter


Processing surface roughness sector  1
```

```
*****************************************************

Processing wind flow sector   1


 AERMOD Finishes Successfully for FLOWSECTOR stage 2 Winter sector   0


    ********   WARNING MESSAGES   ********

               ***  NONE  ***


*****************************************************

Processing wind flow sector   2


 AERMOD Finishes Successfully for FLOWSECTOR stage 2 Winter sector   5


    ********   WARNING MESSAGES   ********

               ***  NONE  ***


*****************************************************

Processing wind flow sector   3


 AERMOD Finishes Successfully for FLOWSECTOR stage 2 Winter sector  10


    ********   WARNING MESSAGES   ********

               ***  NONE  ***
```

```
*****************************************************
Processing wind flow sector   4

 AERMOD Finishes Successfully for FLOWSECTOR stage 2 Winter sector  15

    ********   WARNING MESSAGES   ********
               ***  NONE  ***

*****************************************************
Processing wind flow sector   5

 AERMOD Finishes Successfully for FLOWSECTOR stage 2 Winter sector  20

    ********   WARNING MESSAGES   ********
               ***  NONE  ***

*****************************************************
Processing wind flow sector   6

 AERMOD Finishes Successfully for FLOWSECTOR stage 2 Winter sector  25

    ********   WARNING MESSAGES   ********
               ***  NONE  ***

*****************************************************
```

```
Processing wind flow sector   7


 AERMOD Finishes Successfully for FLOWSECTOR stage 2 Winter sector  30


    ********   WARNING MESSAGES   ********

               ***  NONE  ***

 ********************************************


  Running AERMOD

 Processing Spring


Processing surface roughness sector  1


*****************************************************

Processing wind flow sector   1


 AERMOD Finishes Successfully for FLOWSECTOR stage 2 Spring sector   0


    ********   WARNING MESSAGES   ********

               ***  NONE  ***


*****************************************************

Processing wind flow sector   2


 AERMOD Finishes Successfully for FLOWSECTOR stage 2 Spring sector   5
```

```
    ********   WARNING MESSAGES   ********
               ***  NONE  ***

 *****************************************************
 Processing wind flow sector   3

  AERMOD Finishes Successfully for FLOWSECTOR stage 2 Spring sector  10

    ********   WARNING MESSAGES   ********
               ***  NONE  ***

 *****************************************************
 Processing wind flow sector   4

  AERMOD Finishes Successfully for FLOWSECTOR stage 2 Spring sector  15

    ********   WARNING MESSAGES   ********
               ***  NONE  ***

 *****************************************************
 Processing wind flow sector   5

  AERMOD Finishes Successfully for FLOWSECTOR stage 2 Spring sector  20
```

```
    ********   WARNING MESSAGES   ********
               ***  NONE  ***

*****************************************************

Processing wind flow sector   6


 AERMOD Finishes Successfully for FLOWSECTOR stage 2 Spring sector  25


    ********   WARNING MESSAGES   ********
               ***  NONE  ***

*****************************************************

Processing wind flow sector   7


 AERMOD Finishes Successfully for FLOWSECTOR stage 2 Spring sector  30


    ********   WARNING MESSAGES   ********
               ***  NONE  ***
 ********************************************


  Running AERMOD
 Processing Summer


Processing surface roughness sector  1
```

```
*****************************************************
Processing wind flow sector   1


 AERMOD Finishes Successfully for FLOWSECTOR stage 2 Summer sector   0


    ********   WARNING MESSAGES   ********
               ***  NONE  ***


*****************************************************
Processing wind flow sector   2


 AERMOD Finishes Successfully for FLOWSECTOR stage 2 Summer sector   5


    ********   WARNING MESSAGES   ********
               ***  NONE  ***


*****************************************************
Processing wind flow sector   3


 AERMOD Finishes Successfully for FLOWSECTOR stage 2 Summer sector  10


    ********   WARNING MESSAGES   ********
               ***  NONE  ***


*****************************************************
```

Processing wind flow sector   4

AERMOD Finishes Successfully for FLOWSECTOR stage 2 Summer sector 15

******** WARNING MESSAGES ********

*** NONE ***

****

Processing wind flow sector   5

AERMOD Finishes Successfully for FLOWSECTOR stage 2 Summer sector 20

******** WARNING MESSAGES ********

*** NONE ***

****

Processing wind flow sector   6

AERMOD Finishes Successfully for FLOWSECTOR stage 2 Summer sector 25

******** WARNING MESSAGES ********

*** NONE ***

****

Processing wind flow sector   7

```
 AERMOD Finishes Successfully for FLOWSECTOR stage 2 Summer sector  30


    ********   WARNING MESSAGES   ********

               ***  NONE  ***

 ********************************************


  Running AERMOD

 Processing Autumn


Processing surface roughness sector  1


*****************************************************

Processing wind flow sector   1


 AERMOD Finishes Successfully for FLOWSECTOR stage 2 Autumn sector   0


    ********   WARNING MESSAGES   ********

               ***  NONE  ***


*****************************************************

Processing wind flow sector   2


 AERMOD Finishes Successfully for FLOWSECTOR stage 2 Autumn sector   5
```

```
    ********   WARNING MESSAGES   ********
               ***  NONE  ***

*****************************************************
Processing wind flow sector   3

 AERMOD Finishes Successfully for FLOWSECTOR stage 2 Autumn sector  10

    ********   WARNING MESSAGES   ********
               ***  NONE  ***

*****************************************************
Processing wind flow sector   4

 AERMOD Finishes Successfully for FLOWSECTOR stage 2 Autumn sector  15

    ********   WARNING MESSAGES   ********
               ***  NONE  ***

*****************************************************
Processing wind flow sector   5

 AERMOD Finishes Successfully for FLOWSECTOR stage 2 Autumn sector  20

    ********   WARNING MESSAGES   ********
```

```
               ***  NONE  ***


*****************************************************

Processing wind flow sector   6


 AERMOD Finishes Successfully for FLOWSECTOR stage 2 Autumn sector  25


    ********   WARNING MESSAGES   ********

               ***  NONE  ***


*****************************************************

Processing wind flow sector   7


 AERMOD Finishes Successfully for FLOWSECTOR stage 2 Autumn sector  30


    ********   WARNING MESSAGES   ********

               ***  NONE  ***


FLOWSECTOR   ended 07/19/22 12:30:12


REFINE       started 07/19/22 12:30:12


 AERMOD Finishes Successfully for REFINE stage 3 Winter sector   0


    ********   WARNING MESSAGES   ********
```

```
               ***  NONE  ***


REFINE       ended 07/19/22 12:30:15


 ***********************************************

 AERSCREEN Finished Successfully

 With no errors or warnings

 Check log file for details

 ************************************************


 Ending date and time  07/19/22 12:30:18
```

Concentration	Distance	Elevation	Diag	Season/Month	Zo sector	Date	H0	U*	W*	DT/DZ	ZICNV	ZIMCH	M-O LEN	Z0	BOWEN	ALBEDO	REF WS	HT	REF TA	HT
0.14849E+01	1.00	0.00	0.0	Winter	0-360	10011001	-1.30	0.043	-9.000	0.020	-999.	21.	6.0	1.000	1.50	0.35	0.50	10.0	310.0	2.0
0.16327E+01	25.00	0.00	0.0	Winter	0-360	10011001	-1.30	0.043	-9.000	0.020	-999.	21.	6.0	1.000	1.50	0.35	0.50	10.0	310.0	2.0
0.17549E+01	50.00	0.00	0.0	Winter	0-360	10011001	-1.30	0.043	-9.000	0.020	-999.	21.	6.0	1.000	1.50	0.35	0.50	10.0	310.0	2.0
0.18562E+01	75.00	0.00	5.0	Winter	0-360	10011001	-1.30	0.043	-9.000	0.020	-999.	21.	6.0	1.000	1.50	0.35	0.50	10.0	310.0	2.0
* 0.19311E+01	99.00	0.00	15.0	Winter	0-360	10011001	-1.30	0.043	-9.000	0.020	-999.	21.	6.0	1.000	1.50	0.35	0.50	10.0	310.0	2.0
0.19286E+01	100.00	0.00	15.0	Winter	0-360	10011001	-1.30	0.043	-9.000	0.020	-999.	21.	6.0	1.000	1.50	0.35	0.50	10.0	310.0	2.0
0.13199E+01	125.00	0.00	20.0	Winter	0-360	10011001	-1.30	0.043	-9.000	0.020	-999.	21.	6.0	1.000	1.50	0.35	0.50	10.0	310.0	2.0
0.98145E+00	150.00	0.00	0.0	Winter	0-360	10011001	-1.30	0.043	-9.000	0.020	-999.	21.	6.0	1.000	1.50	0.35	0.50	10.0	310.0	2.0
0.79959E+00	175.00	0.00	0.0	Winter	0-360	10011001	-1.30	0.043	-9.000	0.020	-999.	21.	6.0	1.000	1.50	0.35	0.50	10.0	310.0	2.0
0.66904E+00	200.00	0.00	0.0	Winter	0-360	10011001	-1.30	0.043	-9.000	0.020	-999.	21.	6.0	1.000	1.50	0.35	0.50	10.0	310.0	2.0
0.57158E+00	225.00	0.00	0.0	Winter	0-360	10011001	-1.30	0.043	-9.000	0.020	-999.	21.	6.0	1.000	1.50	0.35	0.50	10.0	310.0	2.0
0.49606E+00	250.00	0.00	0.0	Winter	0-360	10011001	-1.30	0.043	-9.000	0.020	-999.	21.	6.0	1.000	1.50	0.35	0.50	10.0	310.0	2.0
0.43648E+00	275.00	0.00	0.0	Winter	0-360	10011001	-1.30	0.043	-9.000	0.020	-999.	21.	6.0	1.000	1.50	0.35	0.50	10.0	310.0	2.0
0.38828E+00	300.00	0.00	0.0	Winter	0-360	10011001	-1.30	0.043	-9.000	0.020	-999.	21.	6.0	1.000	1.50	0.35	0.50	10.0	310.0	2.0
0.34861E+00	325.00	0.00	0.0	Winter	0-360	10011001	-1.30	0.043	-9.000	0.020	-999.	21.	6.0	1.000	1.50	0.35	0.50	10.0	310.0	2.0
0.31552E+00	350.00	0.00	0.0	Winter	0-360	10011001	-1.30	0.043	-9.000	0.020	-999.	21.	6.0	1.000	1.50	0.35	0.50	10.0	310.0	2.0
0.28754E+00	375.00	0.00	0.0	Winter	0-360	10011001	-1.30	0.043	-9.000	0.020	-999.	21.	6.0	1.000	1.50	0.35	0.50	10.0	310.0	2.0
0.26358E+00	400.00	0.00	0.0	Winter	0-360	10011001	-1.30	0.043	-9.000	0.020	-999.	21.	6.0	1.000	1.50	0.35	0.50	10.0	310.0	2.0
0.24278E+00	425.00	0.00	0.0	Winter	0-360	10011001	-1.30	0.043	-9.000	0.020	-999.	21.	6.0	1.000	1.50	0.35	0.50	10.0	310.0	2.0
0.22481E+00	450.00	0.00	0.0	Winter	0-360	10011001	-1.30	0.043	-9.000	0.020	-999.	21.	6.0	1.000	1.50	0.35	0.50	10.0	310.0	2.0
0.20914E+00	475.00	0.00	0.0	Winter	0-360	10011001	-1.30	0.043	-9.000	0.020	-999.	21.	6.0	1.000	1.50	0.35	0.50	10.0	310.0	2.0
0.19506E+00	500.00	0.00	0.0	Winter	0-360	10011001	-1.30	0.043	-9.000	0.020	-999.	21.	6.0	1.000	1.50	0.35	0.50	10.0	310.0	2.0
0.18255E+00	525.00	0.00	0.0	Winter	0-360	10011001	-1.30	0.043	-9.000	0.020	-999.	21.	6.0	1.000	1.50	0.35	0.50	10.0	310.0	2.0
0.17140E+00	550.00	0.00	0.0	Winter	0-360	10011001	-1.30	0.043	-9.000	0.020	-999.	21.	6.0	1.000	1.50	0.35	0.50	10.0	310.0	2.0
0.16143E+00	575.00	0.00	0.0	Winter	0-360	10011001	-1.30	0.043	-9.000	0.020	-999.	21.	6.0	1.000	1.50	0.35	0.50	10.0	310.0	2.0
0.15246E+00	600.00	0.00	0.0	Winter	0-360	10011001	-1.30	0.043	-9.000	0.020	-999.	21.	6.0							

```
1.000  1.50  0.35   0.50  10.0  310.0   2.0
  0.14423E+00     625.00     0.00   0.0      Winter     0-360   10011001   -1.30  0.043 -9.000  0.020 -999.   21.      6.0
1.000  1.50  0.35   0.50  10.0  310.0   2.0
  0.13676E+00     650.00     0.00   0.0      Winter     0-360   10011001   -1.30  0.043 -9.000  0.020 -999.   21.      6.0
1.000  1.50  0.35   0.50  10.0  310.0   2.0
  0.12996E+00     675.00     0.00   0.0      Winter     0-360   10011001   -1.30  0.043 -9.000  0.020 -999.   21.      6.0
1.000  1.50  0.35   0.50  10.0  310.0   2.0
  0.12373E+00     700.00     0.00   0.0      Winter     0-360   10011001   -1.30  0.043 -9.000  0.020 -999.   21.      6.0
1.000  1.50  0.35   0.50  10.0  310.0   2.0
  0.11797E+00     725.00     0.00   0.0      Winter     0-360   10011001   -1.30  0.043 -9.000  0.020 -999.   21.      6.0
1.000  1.50  0.35   0.50  10.0  310.0   2.0
  0.11267E+00     750.00     0.00   0.0      Winter     0-360   10011001   -1.30  0.043 -9.000  0.020 -999.   21.      6.0
1.000  1.50  0.35   0.50  10.0  310.0   2.0
  0.10778E+00     775.00     0.00   0.0      Winter     0-360   10011001   -1.30  0.043 -9.000  0.020 -999.   21.      6.0
1.000  1.50  0.35   0.50  10.0  310.0   2.0
  0.10326E+00     800.00     0.00   0.0      Winter     0-360   10011001   -1.30  0.043 -9.000  0.020 -999.   21.      6.0
1.000  1.50  0.35   0.50  10.0  310.0   2.0
  0.99017E-01     825.00     0.00   0.0      Winter     0-360   10011001   -1.30  0.043 -9.000  0.020 -999.   21.      6.0
1.000  1.50  0.35   0.50  10.0  310.0   2.0
  0.95066E-01     850.00     0.00   0.0      Winter     0-360   10011001   -1.30  0.043 -9.000  0.020 -999.   21.      6.0
1.000  1.50  0.35   0.50  10.0  310.0   2.0
  0.91386E-01     875.00     0.00   0.0      Winter     0-360   10011001   -1.30  0.043 -9.000  0.020 -999.   21.      6.0
1.000  1.50  0.35   0.50  10.0  310.0   2.0
  0.87952E-01     900.00     0.00   5.0      Winter     0-360   10011001   -1.30  0.043 -9.000  0.020 -999.   21.      6.0
1.000  1.50  0.35   0.50  10.0  310.0   2.0
  0.84736E-01     925.00     0.00   5.0      Winter     0-360   10011001   -1.30  0.043 -9.000  0.020 -999.   21.      6.0
1.000  1.50  0.35   0.50  10.0  310.0   2.0
  0.81719E-01     950.00     0.00   0.0      Winter     0-360   10011001   -1.30  0.043 -9.000  0.020 -999.   21.      6.0
1.000  1.50  0.35   0.50  10.0  310.0   2.0
  0.78889E-01     975.00     0.00   0.0      Winter     0-360   10011001   -1.30  0.043 -9.000  0.020 -999.   21.      6.0
1.000  1.50  0.35   0.50  10.0  310.0   2.0
  0.76227E-01    1000.00     0.00   0.0      Winter     0-360   10011001   -1.30  0.043 -9.000  0.020 -999.   21.      6.0
1.000  1.50  0.35   0.50  10.0  310.0   2.0
  0.73719E-01    1025.00     0.00   0.0      Winter     0-360   10011001   -1.30  0.043 -9.000  0.020 -999.   21.      6.0
1.000  1.50  0.35   0.50  10.0  310.0   2.0
  0.71352E-01    1050.00     0.00   0.0      Winter     0-360   10011001   -1.30  0.043 -9.000  0.020 -999.   21.      6.0
1.000  1.50  0.35   0.50  10.0  310.0   2.0
  0.69117E-01    1075.00     0.00   0.0      Winter     0-360   10011001   -1.30  0.043 -9.000  0.020 -999.   21.      6.0
1.000  1.50  0.35   0.50  10.0  310.0   2.0
  0.66989E-01    1100.00     0.00   0.0      Winter     0-360   10011001   -1.30  0.043 -9.000  0.020 -999.   21.      6.0
1.000  1.50  0.35   0.50  10.0  310.0   2.0
  0.64974E-01    1125.00     0.00   0.0      Winter     0-360   10011001   -1.30  0.043 -9.000  0.020 -999.   21.      6.0
1.000  1.50  0.35   0.50  10.0  310.0   2.0
  0.63063E-01    1150.00     0.00   0.0      Winter     0-360   10011001   -1.30  0.043 -9.000  0.020 -999.   21.      6.0
1.000  1.50  0.35   0.50  10.0  310.0   2.0
  0.61249E-01    1175.00     0.00   0.0      Winter     0-360   10011001   -1.30  0.043 -9.000  0.020 -999.   21.      6.0
1.000  1.50  0.35   0.50  10.0  310.0   2.0
  0.59517E-01    1200.00     0.00   0.0      Winter     0-360   10011001   -1.30  0.043 -9.000  0.020 -999.   21.      6.0
1.000  1.50  0.35   0.50  10.0  310.0   2.0
  0.57863E-01    1225.00     0.00   0.0      Winter     0-360   10011001   -1.30  0.043 -9.000  0.020 -999.   21.      6.0
1.000  1.50  0.35   0.50  10.0  310.0   2.0
  0.56289E-01    1250.00     0.00   0.0      Winter     0-360   10011001   -1.30  0.043 -9.000  0.020 -999.   21.      6.0
1.000  1.50  0.35   0.50  10.0  310.0   2.0
  0.54788E-01    1275.00     0.00   0.0      Winter     0-360   10011001   -1.30  0.043 -9.000  0.020 -999.   21.      6.0
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1.000  1.50  0.35   0.50  10.0  310.0    2.0
  0.53355E-01     1300.00     0.00  0.0      Winter      0-360   10011001   -1.30  0.043 -9.000  0.020 -999.   21.     6.0
1.000  1.50  0.35   0.50  10.0  310.0    2.0
  0.51988E-01     1325.00     0.00  5.0      Winter      0-360   10011001   -1.30  0.043 -9.000  0.020 -999.   21.     6.0
1.000  1.50  0.35   0.50  10.0  310.0    2.0
  0.50683E-01     1350.00     0.00  5.0      Winter      0-360   10011001   -1.30  0.043 -9.000  0.020 -999.   21.     6.0
1.000  1.50  0.35   0.50  10.0  310.0    2.0
  0.49431E-01     1375.00     0.00  5.0      Winter      0-360   10011001   -1.30  0.043 -9.000  0.020 -999.   21.     6.0
1.000  1.50  0.35   0.50  10.0  310.0    2.0
  0.48232E-01     1400.00     0.00  5.0      Winter      0-360   10011001   -1.30  0.043 -9.000  0.020 -999.   21.     6.0
1.000  1.50  0.35   0.50  10.0  310.0    2.0
  0.47084E-01     1425.00     0.00  5.0      Winter      0-360   10011001   -1.30  0.043 -9.000  0.020 -999.   21.     6.0
1.000  1.50  0.35   0.50  10.0  310.0    2.0
  0.45982E-01     1450.00     0.00  5.0      Winter      0-360   10011001   -1.30  0.043 -9.000  0.020 -999.   21.     6.0
1.000  1.50  0.35   0.50  10.0  310.0    2.0
  0.44924E-01     1475.00     0.00  5.0      Winter      0-360   10011001   -1.30  0.043 -9.000  0.020 -999.   21.     6.0
1.000  1.50  0.35   0.50  10.0  310.0    2.0
  0.43909E-01     1500.00     0.00  5.0      Winter      0-360   10011001   -1.30  0.043 -9.000  0.020 -999.   21.     6.0
1.000  1.50  0.35   0.50  10.0  310.0    2.0
  0.42932E-01     1525.00     0.00  5.0      Winter      0-360   10011001   -1.30  0.043 -9.000  0.020 -999.   21.     6.0
1.000  1.50  0.35   0.50  10.0  310.0    2.0
  0.41993E-01     1550.00     0.00  5.0      Winter      0-360   10011001   -1.30  0.043 -9.000  0.020 -999.   21.     6.0
1.000  1.50  0.35   0.50  10.0  310.0    2.0
  0.41090E-01     1575.00     0.00  5.0      Winter      0-360   10011001   -1.30  0.043 -9.000  0.020 -999.   21.     6.0
1.000  1.50  0.35   0.50  10.0  310.0    2.0
  0.40220E-01     1600.00     0.00  5.0      Winter      0-360   10011001   -1.30  0.043 -9.000  0.020 -999.   21.     6.0
1.000  1.50  0.35   0.50  10.0  310.0    2.0
  0.39381E-01     1625.00     0.00  5.0      Winter      0-360   10011001   -1.30  0.043 -9.000  0.020 -999.   21.     6.0
1.000  1.50  0.35   0.50  10.0  310.0    2.0
  0.38573E-01     1650.00     0.00  5.0      Winter      0-360   10011001   -1.30  0.043 -9.000  0.020 -999.   21.     6.0
1.000  1.50  0.35   0.50  10.0  310.0    2.0
  0.37792E-01     1675.00     0.00  5.0      Winter      0-360   10011001   -1.30  0.043 -9.000  0.020 -999.   21.     6.0
1.000  1.50  0.35   0.50  10.0  310.0    2.0
  0.37037E-01     1700.00     0.00  5.0      Winter      0-360   10011001   -1.30  0.043 -9.000  0.020 -999.   21.     6.0
1.000  1.50  0.35   0.50  10.0  310.0    2.0
  0.36310E-01     1725.00     0.00  0.0      Winter      0-360   10011001   -1.30  0.043 -9.000  0.020 -999.   21.     6.0
1.000  1.50  0.35   0.50  10.0  310.0    2.0
  0.35608E-01     1750.00     0.00  0.0      Winter      0-360   10011001   -1.30  0.043 -9.000  0.020 -999.   21.     6.0
1.000  1.50  0.35   0.50  10.0  310.0    2.0
  0.35170E-01     1775.00     0.00  0.0      Winter      0-360   10011001   -1.30  0.043 -9.000  0.020 -999.   21.     6.0
1.000  1.50  0.35   0.50  10.0  310.0    2.0
  0.34502E-01     1800.00     0.00  0.0      Winter      0-360   10011001   -1.30  0.043 -9.000  0.020 -999.   21.     6.0
1.000  1.50  0.35   0.50  10.0  310.0    2.0
  0.33856E-01     1825.00     0.00  0.0      Winter      0-360   10011001   -1.30  0.043 -9.000  0.020 -999.   21.     6.0
1.000  1.50  0.35   0.50  10.0  310.0    2.0
  0.33231E-01     1850.00     0.00  0.0      Winter      0-360   10011001   -1.30  0.043 -9.000  0.020 -999.   21.     6.0
1.000  1.50  0.35   0.50  10.0  310.0    2.0
  0.32625E-01     1875.00     0.00  0.0      Winter      0-360   10011001   -1.30  0.043 -9.000  0.020 -999.   21.     6.0
1.000  1.50  0.35   0.50  10.0  310.0    2.0
  0.32038E-01     1900.00     0.00  0.0      Winter      0-360   10011001   -1.30  0.043 -9.000  0.020 -999.   21.     6.0
1.000  1.50  0.35   0.50  10.0  310.0    2.0
  0.31470E-01     1925.00     0.00  0.0      Winter      0-360   10011001   -1.30  0.043 -9.000  0.020 -999.   21.     6.0
1.000  1.50  0.35   0.50  10.0  310.0    2.0
  0.30918E-01     1950.00     0.00  0.0      Winter      0-360   10011001   -1.30  0.043 -9.000  0.020 -999.   21.     6.0
```

1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.30383E-01 1975.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.29864E-01 2000.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.29360E-01 2025.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.28871E-01 2050.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.28395E-01 2075.00 0.00 5.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.27933E-01 2100.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.27484E-01 2125.00 0.00 5.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.27047E-01 2150.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.26622E-01 2175.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.26209E-01 2200.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.25806E-01 2225.00 0.00 5.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.25414E-01 2250.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.25032E-01 2275.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.24660E-01 2300.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.24298E-01 2325.00 0.00 5.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.23945E-01 2350.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.23600E-01 2375.00 0.00 5.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.23264E-01 2400.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.22936E-01 2425.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.22617E-01 2450.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.22304E-01 2475.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.21999E-01 2500.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.21702E-01 2525.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.21411E-01 2550.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.21127E-01 2575.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.20849E-01 2600.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.20578E-01 2625.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0

1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.20312E-01 2650.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.20053E-01 2675.00 0.00 15.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.19799E-01 2700.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.19551E-01 2725.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.19308E-01 2750.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.19070E-01 2775.00 0.00 10.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.18838E-01 2800.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.18610E-01 2825.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.18387E-01 2850.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.18168E-01 2875.00 0.00 10.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.17954E-01 2900.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.17744E-01 2925.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.17539E-01 2950.00 0.00 5.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.17337E-01 2975.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.17140E-01 3000.00 0.00 5.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.16946E-01 3025.00 0.00 10.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.16756E-01 3050.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.16570E-01 3075.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.16388E-01 3100.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.16208E-01 3125.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.16033E-01 3150.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.15860E-01 3175.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.15691E-01 3199.99 0.00 10.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.15525E-01 3225.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.15361E-01 3250.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.15201E-01 3275.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.15044E-01 3300.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0

1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.14889E-01 3325.00 0.00 15.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.14737E-01 3350.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.14588E-01 3375.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.14441E-01 3400.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.14297E-01 3425.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.14156E-01 3450.00 0.00 5.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.14017E-01 3475.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.13880E-01 3500.00 0.00 20.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.13745E-01 3525.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.13613E-01 3550.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.13483E-01 3575.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.13355E-01 3600.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.13229E-01 3625.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.13105E-01 3650.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.12983E-01 3675.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.12863E-01 3700.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.12745E-01 3725.00 0.00 15.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.12629E-01 3750.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.12515E-01 3775.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.12403E-01 3800.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.12292E-01 3825.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.12183E-01 3849.99 0.00 15.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.12075E-01 3875.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.11969E-01 3900.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.11865E-01 3925.00 0.00 5.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.11763E-01 3950.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.11661E-01 3975.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0

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1.000  1.50  0.35   0.50  10.0  310.0   2.0
  0.11562E-01     4000.00     0.00   0.0     Winter     0-360   10011001   -1.30  0.043 -9.000  0.020 -999.   21.     6.0
1.000  1.50  0.35   0.50  10.0  310.0   2.0
  0.11464E-01     4025.00     0.00   0.0     Winter     0-360   10011001   -1.30  0.043 -9.000  0.020 -999.   21.     6.0
1.000  1.50  0.35   0.50  10.0  310.0   2.0
  0.11367E-01     4050.00     0.00   0.0     Winter     0-360   10011001   -1.30  0.043 -9.000  0.020 -999.   21.     6.0
1.000  1.50  0.35   0.50  10.0  310.0   2.0
  0.11272E-01     4075.00     0.00   0.0     Winter     0-360   10011001   -1.30  0.043 -9.000  0.020 -999.   21.     6.0
1.000  1.50  0.35   0.50  10.0  310.0   2.0
  0.11178E-01     4100.00     0.00   0.0     Winter     0-360   10011001   -1.30  0.043 -9.000  0.020 -999.   21.     6.0
1.000  1.50  0.35   0.50  10.0  310.0   2.0
  0.11085E-01     4125.00     0.00   0.0     Winter     0-360   10011001   -1.30  0.043 -9.000  0.020 -999.   21.     6.0
1.000  1.50  0.35   0.50  10.0  310.0   2.0
  0.10994E-01     4150.00     0.00   0.0     Winter     0-360   10011001   -1.30  0.043 -9.000  0.020 -999.   21.     6.0
1.000  1.50  0.35   0.50  10.0  310.0   2.0
  0.10904E-01     4175.00     0.00   0.0     Winter     0-360   10011001   -1.30  0.043 -9.000  0.020 -999.   21.     6.0
1.000  1.50  0.35   0.50  10.0  310.0   2.0
  0.10815E-01     4200.00     0.00   0.0     Winter     0-360   10011001   -1.30  0.043 -9.000  0.020 -999.   21.     6.0
1.000  1.50  0.35   0.50  10.0  310.0   2.0
  0.10728E-01     4225.00     0.00   0.0     Winter     0-360   10011001   -1.30  0.043 -9.000  0.020 -999.   21.     6.0
1.000  1.50  0.35   0.50  10.0  310.0   2.0
  0.10642E-01     4250.00     0.00  15.0     Winter     0-360   10011001   -1.30  0.043 -9.000  0.020 -999.   21.     6.0
1.000  1.50  0.35   0.50  10.0  310.0   2.0
  0.10557E-01     4275.00     0.00   0.0     Winter     0-360   10011001   -1.30  0.043 -9.000  0.020 -999.   21.     6.0
1.000  1.50  0.35   0.50  10.0  310.0   2.0
  0.10473E-01     4300.00     0.00   0.0     Winter     0-360   10011001   -1.30  0.043 -9.000  0.020 -999.   21.     6.0
1.000  1.50  0.35   0.50  10.0  310.0   2.0
  0.10390E-01     4325.00     0.00   0.0     Winter     0-360   10011001   -1.30  0.043 -9.000  0.020 -999.   21.     6.0
1.000  1.50  0.35   0.50  10.0  310.0   2.0
  0.10308E-01     4350.00     0.00   0.0     Winter     0-360   10011001   -1.30  0.043 -9.000  0.020 -999.   21.     6.0
1.000  1.50  0.35   0.50  10.0  310.0   2.0
  0.10228E-01     4375.00     0.00   0.0     Winter     0-360   10011001   -1.30  0.043 -9.000  0.020 -999.   21.     6.0
1.000  1.50  0.35   0.50  10.0  310.0   2.0
  0.10149E-01     4400.00     0.00   0.0     Winter     0-360   10011001   -1.30  0.043 -9.000  0.020 -999.   21.     6.0
1.000  1.50  0.35   0.50  10.0  310.0   2.0
  0.10070E-01     4425.00     0.00   0.0     Winter     0-360   10011001   -1.30  0.043 -9.000  0.020 -999.   21.     6.0
1.000  1.50  0.35   0.50  10.0  310.0   2.0
  0.99928E-02     4450.00     0.00  10.0     Winter     0-360   10011001   -1.30  0.043 -9.000  0.020 -999.   21.     6.0
1.000  1.50  0.35   0.50  10.0  310.0   2.0
  0.99165E-02     4475.00     0.00   5.0     Winter     0-360   10011001   -1.30  0.043 -9.000  0.020 -999.   21.     6.0
1.000  1.50  0.35   0.50  10.0  310.0   2.0
  0.98412E-02     4500.00     0.00  10.0     Winter     0-360   10011001   -1.30  0.043 -9.000  0.020 -999.   21.     6.0
1.000  1.50  0.35   0.50  10.0  310.0   2.0
  0.97669E-02     4525.00     0.00  10.0     Winter     0-360   10011001   -1.30  0.043 -9.000  0.020 -999.   21.     6.0
1.000  1.50  0.35   0.50  10.0  310.0   2.0
  0.96936E-02     4550.00     0.00  15.0     Winter     0-360   10011001   -1.30  0.043 -9.000  0.020 -999.   21.     6.0
1.000  1.50  0.35   0.50  10.0  310.0   2.0
  0.96212E-02     4575.00     0.00  20.0     Winter     0-360   10011001   -1.30  0.043 -9.000  0.020 -999.   21.     6.0
1.000  1.50  0.35   0.50  10.0  310.0   2.0
  0.95497E-02     4600.00     0.00   0.0     Winter     0-360   10011001   -1.30  0.043 -9.000  0.020 -999.   21.     6.0
1.000  1.50  0.35   0.50  10.0  310.0   2.0
  0.94792E-02     4625.00     0.00   0.0     Winter     0-360   10011001   -1.30  0.043 -9.000  0.020 -999.   21.     6.0
1.000  1.50  0.35   0.50  10.0  310.0   2.0
  0.94096E-02     4650.00     0.00  20.0     Winter     0-360   10011001   -1.30  0.043 -9.000  0.020 -999.   21.     6.0
```

```
1.000   1.50   0.35    0.50   10.0   310.0    2.0
  0.93408E-02     4675.00     0.00  15.0       Winter      0-360   10011001   -1.30  0.043 -9.000  0.020 -999.   21.      6.0
1.000   1.50   0.35    0.50   10.0   310.0    2.0
  0.92729E-02     4700.00     0.00   0.0       Winter      0-360   10011001   -1.30  0.043 -9.000  0.020 -999.   21.      6.0
1.000   1.50   0.35    0.50   10.0   310.0    2.0
  0.92058E-02     4725.00     0.00  25.0       Winter      0-360   10011001   -1.30  0.043 -9.000  0.020 -999.   21.      6.0
1.000   1.50   0.35    0.50   10.0   310.0    2.0
  0.91396E-02     4750.00     0.00   5.0       Winter      0-360   10011001   -1.30  0.043 -9.000  0.020 -999.   21.      6.0
1.000   1.50   0.35    0.50   10.0   310.0    2.0
  0.90742E-02     4775.00     0.00   0.0       Winter      0-360   10011001   -1.30  0.043 -9.000  0.020 -999.   21.      6.0
1.000   1.50   0.35    0.50   10.0   310.0    2.0
  0.90097E-02     4800.00     0.00   5.0       Winter      0-360   10011001   -1.30  0.043 -9.000  0.020 -999.   21.      6.0
1.000   1.50   0.35    0.50   10.0   310.0    2.0
  0.89459E-02     4825.00     0.00   0.0       Winter      0-360   10011001   -1.30  0.043 -9.000  0.020 -999.   21.      6.0
1.000   1.50   0.35    0.50   10.0   310.0    2.0
  0.88829E-02     4850.00     0.00   5.0       Winter      0-360   10011001   -1.30  0.043 -9.000  0.020 -999.   21.      6.0
1.000   1.50   0.35    0.50   10.0   310.0    2.0
  0.88206E-02     4875.00     0.00  25.0       Winter      0-360   10011001   -1.30  0.043 -9.000  0.020 -999.   21.      6.0
1.000   1.50   0.35    0.50   10.0   310.0    2.0
  0.87591E-02     4900.00     0.00   5.0       Winter      0-360   10011001   -1.30  0.043 -9.000  0.020 -999.   21.      6.0
1.000   1.50   0.35    0.50   10.0   310.0    2.0
  0.86983E-02     4924.99     0.00  15.0       Winter      0-360   10011001   -1.30  0.043 -9.000  0.020 -999.   21.      6.0
1.000   1.50   0.35    0.50   10.0   310.0    2.0
  0.86383E-02     4950.00     0.00   5.0       Winter      0-360   10011001   -1.30  0.043 -9.000  0.020 -999.   21.      6.0
1.000   1.50   0.35    0.50   10.0   310.0    2.0
  0.85790E-02     4975.00     0.00   0.0       Winter      0-360   10011001   -1.30  0.043 -9.000  0.020 -999.   21.      6.0
1.000   1.50   0.35    0.50   10.0   310.0    2.0
  0.85204E-02     5000.00     0.00   5.0       Winter      0-360   10011001   -1.30  0.043 -9.000  0.020 -999.   21.      6.0
1.000   1.50   0.35    0.50   10.0   310.0    2.0
```

```
 Start date and time  07/19/22 12:30:36

                             AERSCREEN 21112


             Summit Avenue Warehouse - Operations



          -----------------  DATA ENTRY VALIDATION  -----------------

                        METRIC              ENGLISH

  ** AREADATA **  ---------------     ----------------


  Emission Rate:    0.869E-04 g/s        0.690E-03 lb/hr

  Area Height:           3.00 meters          9.84 feet

  Area Source Length:  190.63 meters        625.43 feet

  Area Source Width:    95.32 meters        312.73 feet

  Vertical Dimension:    1.50 meters          4.92 feet

  Model Mode:           URBAN

  Population:          212704

  Dist to Ambient Air:           1.0 meters             3. feet



  ** BUILDING DATA **


  No Building Downwash Parameters
```

** TERRAIN DATA **

No Terrain Elevations

Source Base Elevation: 0.0 meters   0.0 feet

Probe distance: 5000. meters   16404. feet

No flagpole receptors

No discrete receptors used

** FUMIGATION DATA **

No fumigation requested

** METEOROLOGY DATA **

Min/Max Temperature: 250.0 / 310.0 K   -9.7 / 98.3 Deg F

Minimum Wind Speed: 0.5 m/s

Anemometer Height: 10.000 meters

Dominant Surface Profile: Urban

Dominant Climate Type: Average Moisture

Surface friction velocity (u*): not adjusted

DEBUG OPTION ON

AERSCREEN output file:

2022.07.19_SummitAvenueWarehouse_AERSCREEN_Operations.out

*** AERSCREEN Run is Ready to Begin

No terrain used, AERMAP will not be run

****

SURFACE CHARACTERISTICS & MAKEMET

Obtaining surface characteristics...

Using AERMET seasonal surface characteristics for Urban with Average Moisture

Season	Albedo	Bo	zo
Winter	0.35	1.50	1.000
Spring	0.14	1.00	1.000
Summer	0.16	2.00	1.000
Autumn	0.18	2.00	1.000

Creating met files aerscreen_01_01.sfc & aerscreen_01_01.pfl

Creating met files aerscreen_02_01.sfc & aerscreen_02_01.pfl

Creating met files aerscreen_03_01.sfc & aerscreen_03_01.pfl

Creating met files aerscreen_04_01.sfc & aerscreen_04_01.pfl

Buildings and/or terrain present or rectangular area source, skipping probe

FLOWSECTOR started 07/19/22 12:32:28

****

Running AERMOD

Processing Winter

Processing surface roughness sector 1

****

```
Processing wind flow sector   1


 AERMOD Finishes Successfully for FLOWSECTOR stage 2 Winter sector   0


    ********   WARNING MESSAGES   ********
               ***  NONE  ***


*****************************************************
Processing wind flow sector   2


 AERMOD Finishes Successfully for FLOWSECTOR stage 2 Winter sector   5


    ********   WARNING MESSAGES   ********
               ***  NONE  ***


*****************************************************
Processing wind flow sector   3


 AERMOD Finishes Successfully for FLOWSECTOR stage 2 Winter sector  10


    ********   WARNING MESSAGES   ********
               ***  NONE  ***


*****************************************************
Processing wind flow sector   4
```

```
 AERMOD Finishes Successfully for FLOWSECTOR stage 2 Winter sector  15

    ********   WARNING MESSAGES   ********
               ***  NONE  ***

*****************************************************
Processing wind flow sector   5

 AERMOD Finishes Successfully for FLOWSECTOR stage 2 Winter sector  20

    ********   WARNING MESSAGES   ********
               ***  NONE  ***

*****************************************************
Processing wind flow sector   6

 AERMOD Finishes Successfully for FLOWSECTOR stage 2 Winter sector  25

    ********   WARNING MESSAGES   ********
               ***  NONE  ***

*****************************************************
Processing wind flow sector   7
```

AERMOD Finishes Successfully for FLOWSECTOR stage 2 Winter sector 30

******** WARNING MESSAGES ********

*** NONE ***

****

Running AERMOD

Processing Spring

Processing surface roughness sector 1

****

Processing wind flow sector   1

AERMOD Finishes Successfully for FLOWSECTOR stage 2 Spring sector   0

******** WARNING MESSAGES ********

*** NONE ***

****

Processing wind flow sector   2

AERMOD Finishes Successfully for FLOWSECTOR stage 2 Spring sector   5

******** WARNING MESSAGES ********

```
               ***  NONE  ***


*****************************************************

Processing wind flow sector   3


 AERMOD Finishes Successfully for FLOWSECTOR stage 2 Spring sector  10


    ********   WARNING MESSAGES   ********

               ***  NONE  ***


*****************************************************

Processing wind flow sector   4


 AERMOD Finishes Successfully for FLOWSECTOR stage 2 Spring sector  15


    ********   WARNING MESSAGES   ********

               ***  NONE  ***


*****************************************************

Processing wind flow sector   5


 AERMOD Finishes Successfully for FLOWSECTOR stage 2 Spring sector  20


    ********   WARNING MESSAGES   ********

               ***  NONE  ***
```

```
*****************************************************

Processing wind flow sector   6


 AERMOD Finishes Successfully for FLOWSECTOR stage 2 Spring sector  25


    ********   WARNING MESSAGES   ********

               ***  NONE  ***


*****************************************************

Processing wind flow sector   7


 AERMOD Finishes Successfully for FLOWSECTOR stage 2 Spring sector  30


    ********   WARNING MESSAGES   ********

               ***  NONE  ***

 ********************************************


  Running AERMOD

 Processing Summer


Processing surface roughness sector  1


*****************************************************

Processing wind flow sector   1
```

```
 AERMOD Finishes Successfully for FLOWSECTOR stage 2 Summer sector   0

    ********   WARNING MESSAGES   ********
               ***  NONE  ***

*****************************************************
Processing wind flow sector   2

 AERMOD Finishes Successfully for FLOWSECTOR stage 2 Summer sector   5

    ********   WARNING MESSAGES   ********
               ***  NONE  ***

*****************************************************
Processing wind flow sector   3

 AERMOD Finishes Successfully for FLOWSECTOR stage 2 Summer sector  10

    ********   WARNING MESSAGES   ********
               ***  NONE  ***

*****************************************************
Processing wind flow sector   4
```

```
 AERMOD Finishes Successfully for FLOWSECTOR stage 2 Summer sector  15


    ********   WARNING MESSAGES   ********
               ***  NONE  ***


**************************************************
Processing wind flow sector   5


 AERMOD Finishes Successfully for FLOWSECTOR stage 2 Summer sector  20


    ********   WARNING MESSAGES   ********
               ***  NONE  ***


**************************************************
Processing wind flow sector   6


 AERMOD Finishes Successfully for FLOWSECTOR stage 2 Summer sector  25


    ********   WARNING MESSAGES   ********
               ***  NONE  ***


**************************************************
Processing wind flow sector   7


 AERMOD Finishes Successfully for FLOWSECTOR stage 2 Summer sector  30
```

```
    ********   WARNING MESSAGES   ********
               ***  NONE  ***
 ********************************************

  Running AERMOD
 Processing Autumn

Processing surface roughness sector  1

*****************************************************
Processing wind flow sector   1

 AERMOD Finishes Successfully for FLOWSECTOR stage 2 Autumn sector   0

    ********   WARNING MESSAGES   ********
               ***  NONE  ***

*****************************************************
Processing wind flow sector   2

 AERMOD Finishes Successfully for FLOWSECTOR stage 2 Autumn sector   5

    ********   WARNING MESSAGES   ********
               ***  NONE  ***
```

```
*****************************************************
Processing wind flow sector   3


 AERMOD Finishes Successfully for FLOWSECTOR stage 2 Autumn sector  10


    ********   WARNING MESSAGES   ********
               ***  NONE  ***


*****************************************************
Processing wind flow sector   4


 AERMOD Finishes Successfully for FLOWSECTOR stage 2 Autumn sector  15


    ********   WARNING MESSAGES   ********
               ***  NONE  ***


*****************************************************
Processing wind flow sector   5


 AERMOD Finishes Successfully for FLOWSECTOR stage 2 Autumn sector  20


    ********   WARNING MESSAGES   ********
               ***  NONE  ***
```

```
****************************************************
Processing wind flow sector   6

 AERMOD Finishes Successfully for FLOWSECTOR stage 2 Autumn sector  25

    ********   WARNING MESSAGES   ********
               ***  NONE  ***

****************************************************
Processing wind flow sector   7

 AERMOD Finishes Successfully for FLOWSECTOR stage 2 Autumn sector  30

    ********   WARNING MESSAGES   ********
               ***  NONE  ***

FLOWSECTOR   ended 07/19/22 12:32:46

REFINE       started 07/19/22 12:32:46

 AERMOD Finishes Successfully for REFINE stage 3 Winter sector   0

    ********   WARNING MESSAGES   ********
               ***  NONE  ***
```

REFINE   ended 07/19/22 12:32:49

****

AERSCREEN Finished Successfully

With no errors or warnings

Check log file for details

****

Ending date and time 07/19/22 12:32:52

Concentration Distance Elevation Diag Season/Month Zo sector Date H0 U* W* DT/DZ ZICNV
ZIMCH M-O LEN Z0 BOWEN ALBEDO REF WS HT REF TA HT
0.11738E+00 1.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.12906E+00 25.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.13872E+00 50.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.14673E+00 75.00 0.00 5.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
* 0.15266E+00 99.00 0.00 15.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.15245E+00 100.00 0.00 15.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.10434E+00 125.00 0.00 20.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.77584E-01 150.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.63209E-01 175.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.52888E-01 200.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.45184E-01 225.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.39214E-01 250.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.34504E-01 275.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.30694E-01 300.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.27558E-01 325.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.24942E-01 350.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.22730E-01 375.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.20836E-01 400.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.19192E-01 425.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.17772E-01 450.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.16533E-01 475.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.15420E-01 500.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.14430E-01 525.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.13550E-01 550.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.12761E-01 575.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.12052E-01 600.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0

```
1.000  1.50  0.35   0.50  10.0  310.0   2.0
  0.11401E-01     625.00     0.00  0.0      Winter      0-360   10011001   -1.30  0.043 -9.000  0.020 -999.   21.      6.0
1.000  1.50  0.35   0.50  10.0  310.0   2.0
  0.10811E-01     650.00     0.00  0.0      Winter      0-360   10011001   -1.30  0.043 -9.000  0.020 -999.   21.      6.0
1.000  1.50  0.35   0.50  10.0  310.0   2.0
  0.10273E-01     675.00     0.00  0.0      Winter      0-360   10011001   -1.30  0.043 -9.000  0.020 -999.   21.      6.0
1.000  1.50  0.35   0.50  10.0  310.0   2.0
  0.97807E-02     700.00     0.00  0.0      Winter      0-360   10011001   -1.30  0.043 -9.000  0.020 -999.   21.      6.0
1.000  1.50  0.35   0.50  10.0  310.0   2.0
  0.93256E-02     725.00     0.00  0.0      Winter      0-360   10011001   -1.30  0.043 -9.000  0.020 -999.   21.      6.0
1.000  1.50  0.35   0.50  10.0  310.0   2.0
  0.89068E-02     750.00     0.00  0.0      Winter      0-360   10011001   -1.30  0.043 -9.000  0.020 -999.   21.      6.0
1.000  1.50  0.35   0.50  10.0  310.0   2.0
  0.85203E-02     775.00     0.00  0.0      Winter      0-360   10011001   -1.30  0.043 -9.000  0.020 -999.   21.      6.0
1.000  1.50  0.35   0.50  10.0  310.0   2.0
  0.81626E-02     800.00     0.00  0.0      Winter      0-360   10011001   -1.30  0.043 -9.000  0.020 -999.   21.      6.0
1.000  1.50  0.35   0.50  10.0  310.0   2.0
  0.78274E-02     825.00     0.00  0.0      Winter      0-360   10011001   -1.30  0.043 -9.000  0.020 -999.   21.      6.0
1.000  1.50  0.35   0.50  10.0  310.0   2.0
  0.75151E-02     850.00     0.00  0.0      Winter      0-360   10011001   -1.30  0.043 -9.000  0.020 -999.   21.      6.0
1.000  1.50  0.35   0.50  10.0  310.0   2.0
  0.72242E-02     875.00     0.00  0.0      Winter      0-360   10011001   -1.30  0.043 -9.000  0.020 -999.   21.      6.0
1.000  1.50  0.35   0.50  10.0  310.0   2.0
  0.69527E-02     900.00     0.00  5.0      Winter      0-360   10011001   -1.30  0.043 -9.000  0.020 -999.   21.      6.0
1.000  1.50  0.35   0.50  10.0  310.0   2.0
  0.66984E-02     925.00     0.00  5.0      Winter      0-360   10011001   -1.30  0.043 -9.000  0.020 -999.   21.      6.0
1.000  1.50  0.35   0.50  10.0  310.0   2.0
  0.64599E-02     950.00     0.00  0.0      Winter      0-360   10011001   -1.30  0.043 -9.000  0.020 -999.   21.      6.0
1.000  1.50  0.35   0.50  10.0  310.0   2.0
  0.62363E-02     975.00     0.00  0.0      Winter      0-360   10011001   -1.30  0.043 -9.000  0.020 -999.   21.      6.0
1.000  1.50  0.35   0.50  10.0  310.0   2.0
  0.60258E-02    1000.00     0.00  0.0      Winter      0-360   10011001   -1.30  0.043 -9.000  0.020 -999.   21.      6.0
1.000  1.50  0.35   0.50  10.0  310.0   2.0
  0.58275E-02    1025.00     0.00  0.0      Winter      0-360   10011001   -1.30  0.043 -9.000  0.020 -999.   21.      6.0
1.000  1.50  0.35   0.50  10.0  310.0   2.0
  0.56405E-02    1050.00     0.00  0.0      Winter      0-360   10011001   -1.30  0.043 -9.000  0.020 -999.   21.      6.0
1.000  1.50  0.35   0.50  10.0  310.0   2.0
  0.54637E-02    1075.00     0.00  0.0      Winter      0-360   10011001   -1.30  0.043 -9.000  0.020 -999.   21.      6.0
1.000  1.50  0.35   0.50  10.0  310.0   2.0
  0.52956E-02    1100.00     0.00  0.0      Winter      0-360   10011001   -1.30  0.043 -9.000  0.020 -999.   21.      6.0
1.000  1.50  0.35   0.50  10.0  310.0   2.0
  0.51363E-02    1125.00     0.00  0.0      Winter      0-360   10011001   -1.30  0.043 -9.000  0.020 -999.   21.      6.0
1.000  1.50  0.35   0.50  10.0  310.0   2.0
  0.49852E-02    1150.00     0.00  0.0      Winter      0-360   10011001   -1.30  0.043 -9.000  0.020 -999.   21.      6.0
1.000  1.50  0.35   0.50  10.0  310.0   2.0
  0.48418E-02    1175.00     0.00  0.0      Winter      0-360   10011001   -1.30  0.043 -9.000  0.020 -999.   21.      6.0
1.000  1.50  0.35   0.50  10.0  310.0   2.0
  0.47048E-02    1200.00     0.00  0.0      Winter      0-360   10011001   -1.30  0.043 -9.000  0.020 -999.   21.      6.0
1.000  1.50  0.35   0.50  10.0  310.0   2.0
  0.45742E-02    1225.00     0.00  0.0      Winter      0-360   10011001   -1.30  0.043 -9.000  0.020 -999.   21.      6.0
1.000  1.50  0.35   0.50  10.0  310.0   2.0
  0.44497E-02    1250.00     0.00  0.0      Winter      0-360   10011001   -1.30  0.043 -9.000  0.020 -999.   21.      6.0
1.000  1.50  0.35   0.50  10.0  310.0   2.0
  0.43310E-02    1275.00     0.00  0.0      Winter      0-360   10011001   -1.30  0.043 -9.000  0.020 -999.   21.      6.0
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1.000  1.50  0.35  0.50  10.0  310.0  2.0
 0.42178E-02   1300.00   0.00  0.0   Winter   0-360  10011001  -1.30  0.043 -9.000  0.020 -999.  21.   6.0
1.000  1.50  0.35  0.50  10.0  310.0  2.0
 0.41097E-02   1325.00   0.00  5.0   Winter   0-360  10011001  -1.30  0.043 -9.000  0.020 -999.  21.   6.0
1.000  1.50  0.35  0.50  10.0  310.0  2.0
 0.40065E-02   1350.00   0.00  5.0   Winter   0-360  10011001  -1.30  0.043 -9.000  0.020 -999.  21.   6.0
1.000  1.50  0.35  0.50  10.0  310.0  2.0
 0.39076E-02   1375.00   0.00  5.0   Winter   0-360  10011001  -1.30  0.043 -9.000  0.020 -999.  21.   6.0
1.000  1.50  0.35  0.50  10.0  310.0  2.0
 0.38128E-02   1400.00   0.00  5.0   Winter   0-360  10011001  -1.30  0.043 -9.000  0.020 -999.  21.   6.0
1.000  1.50  0.35  0.50  10.0  310.0  2.0
 0.37220E-02   1425.00   0.00  5.0   Winter   0-360  10011001  -1.30  0.043 -9.000  0.020 -999.  21.   6.0
1.000  1.50  0.35  0.50  10.0  310.0  2.0
 0.36349E-02   1450.00   0.00  5.0   Winter   0-360  10011001  -1.30  0.043 -9.000  0.020 -999.  21.   6.0
1.000  1.50  0.35  0.50  10.0  310.0  2.0
 0.35513E-02   1475.00   0.00  5.0   Winter   0-360  10011001  -1.30  0.043 -9.000  0.020 -999.  21.   6.0
1.000  1.50  0.35  0.50  10.0  310.0  2.0
 0.34710E-02   1500.00   0.00  5.0   Winter   0-360  10011001  -1.30  0.043 -9.000  0.020 -999.  21.   6.0
1.000  1.50  0.35  0.50  10.0  310.0  2.0
 0.33938E-02   1525.00   0.00  5.0   Winter   0-360  10011001  -1.30  0.043 -9.000  0.020 -999.  21.   6.0
1.000  1.50  0.35  0.50  10.0  310.0  2.0
 0.33196E-02   1550.00   0.00  5.0   Winter   0-360  10011001  -1.30  0.043 -9.000  0.020 -999.  21.   6.0
1.000  1.50  0.35  0.50  10.0  310.0  2.0
 0.32482E-02   1575.00   0.00  5.0   Winter   0-360  10011001  -1.30  0.043 -9.000  0.020 -999.  21.   6.0
1.000  1.50  0.35  0.50  10.0  310.0  2.0
 0.31794E-02   1600.00   0.00  5.0   Winter   0-360  10011001  -1.30  0.043 -9.000  0.020 -999.  21.   6.0
1.000  1.50  0.35  0.50  10.0  310.0  2.0
 0.31131E-02   1625.00   0.00  5.0   Winter   0-360  10011001  -1.30  0.043 -9.000  0.020 -999.  21.   6.0
1.000  1.50  0.35  0.50  10.0  310.0  2.0
 0.30492E-02   1650.00   0.00  5.0   Winter   0-360  10011001  -1.30  0.043 -9.000  0.020 -999.  21.   6.0
1.000  1.50  0.35  0.50  10.0  310.0  2.0
 0.29875E-02   1675.00   0.00  5.0   Winter   0-360  10011001  -1.30  0.043 -9.000  0.020 -999.  21.   6.0
1.000  1.50  0.35  0.50  10.0  310.0  2.0
 0.29279E-02   1700.00   0.00  5.0   Winter   0-360  10011001  -1.30  0.043 -9.000  0.020 -999.  21.   6.0
1.000  1.50  0.35  0.50  10.0  310.0  2.0
 0.28704E-02   1725.00   0.00  0.0   Winter   0-360  10011001  -1.30  0.043 -9.000  0.020 -999.  21.   6.0
1.000  1.50  0.35  0.50  10.0  310.0  2.0
 0.28149E-02   1750.00   0.00  0.0   Winter   0-360  10011001  -1.30  0.043 -9.000  0.020 -999.  21.   6.0
1.000  1.50  0.35  0.50  10.0  310.0  2.0
 0.27802E-02   1775.00   0.00  0.0   Winter   0-360  10011001  -1.30  0.043 -9.000  0.020 -999.  21.   6.0
1.000  1.50  0.35  0.50  10.0  310.0  2.0
 0.27274E-02   1800.00   0.00  0.0   Winter   0-360  10011001  -1.30  0.043 -9.000  0.020 -999.  21.   6.0
1.000  1.50  0.35  0.50  10.0  310.0  2.0
 0.26764E-02   1825.00   0.00  0.0   Winter   0-360  10011001  -1.30  0.043 -9.000  0.020 -999.  21.   6.0
1.000  1.50  0.35  0.50  10.0  310.0  2.0
 0.26269E-02   1850.00   0.00  0.0   Winter   0-360  10011001  -1.30  0.043 -9.000  0.020 -999.  21.   6.0
1.000  1.50  0.35  0.50  10.0  310.0  2.0
 0.25790E-02   1875.00   0.00  0.0   Winter   0-360  10011001  -1.30  0.043 -9.000  0.020 -999.  21.   6.0
1.000  1.50  0.35  0.50  10.0  310.0  2.0
 0.25327E-02   1900.00   0.00  0.0   Winter   0-360  10011001  -1.30  0.043 -9.000  0.020 -999.  21.   6.0
1.000  1.50  0.35  0.50  10.0  310.0  2.0
 0.24877E-02   1925.00   0.00  0.0   Winter   0-360  10011001  -1.30  0.043 -9.000  0.020 -999.  21.   6.0
1.000  1.50  0.35  0.50  10.0  310.0  2.0
 0.24441E-02   1950.00   0.00  0.0   Winter   0-360  10011001  -1.30  0.043 -9.000  0.020 -999.  21.   6.0
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1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.24018E-02 1975.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.23608E-02 2000.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.23209E-02 2025.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.22822E-02 2050.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.22447E-02 2075.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.22081E-02 2100.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.21726E-02 2125.00 0.00 5.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.21381E-02 2150.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.21045E-02 2175.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.20718E-02 2200.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.20400E-02 2225.00 0.00 5.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.20090E-02 2250.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.19788E-02 2275.00 0.00 5.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.19494E-02 2300.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.19208E-02 2325.00 0.00 5.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.18929E-02 2350.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.18656E-02 2375.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.18391E-02 2400.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.18132E-02 2425.00 0.00 5.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.17879E-02 2450.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.17632E-02 2475.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.17391E-02 2500.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.17155E-02 2525.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.16926E-02 2550.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.16701E-02 2575.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.16481E-02 2600.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.16267E-02 2625.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0

1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.16057E-02 2650.00 0.00 15.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.15852E-02 2675.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.15651E-02 2700.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.15455E-02 2725.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.15263E-02 2750.00 0.00 20.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.15075E-02 2775.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.14891E-02 2800.00 0.00 15.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.14711E-02 2825.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.14535E-02 2850.00 0.00 10.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.14362E-02 2875.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.14193E-02 2900.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.14027E-02 2925.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.13865E-02 2950.00 0.00 5.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.13705E-02 2975.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.13549E-02 3000.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.13396E-02 3025.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.13246E-02 3050.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.13099E-02 3075.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.12955E-02 3100.00 0.00 5.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.12813E-02 3125.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.12674E-02 3150.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.12538E-02 3174.99 0.00 10.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.12404E-02 3200.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.12272E-02 3225.00 0.00 10.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.12143E-02 3250.00 0.00 10.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.12017E-02 3275.00 0.00 30.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.11892E-02 3300.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0

1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.11770E-02 3325.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.11650E-02 3350.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.11532E-02 3375.00 0.00 20.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.11416E-02 3400.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.11302E-02 3425.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.11190E-02 3450.00 0.00 5.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.11080E-02 3475.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.10972E-02 3500.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.10866E-02 3525.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.10761E-02 3550.00 0.00 25.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.10658E-02 3575.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.10557E-02 3600.00 0.00 20.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.10458E-02 3625.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.10360E-02 3650.00 0.00 25.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.10263E-02 3675.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.10169E-02 3700.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.10075E-02 3725.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.99836E-03 3750.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.98932E-03 3775.00 0.00 25.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.98043E-03 3800.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.97167E-03 3825.00 0.00 5.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.96305E-03 3849.99 0.00 15.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.95456E-03 3875.00 0.00 5.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.94620E-03 3900.00 0.00 15.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.93796E-03 3925.00 0.00 5.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.92985E-03 3950.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.92185E-03 3975.00 0.00 5.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0

1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.91398E-03 4000.00 0.00 15.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.90622E-03 4025.00 0.00 5.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.89858E-03 4050.00 0.00 30.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.89104E-03 4075.00 0.00 5.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.88362E-03 4100.00 0.00 10.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.87630E-03 4125.00 0.00 5.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.86909E-03 4149.99 0.00 20.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.86198E-03 4175.00 0.00 25.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.85496E-03 4200.00 0.00 10.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.84805E-03 4225.00 0.00 5.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.84123E-03 4250.00 0.00 10.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.83451E-03 4275.00 0.00 5.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.82788E-03 4300.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.82134E-03 4325.00 0.00 5.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.81489E-03 4350.00 0.00 10.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.80853E-03 4375.00 0.00 10.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.80225E-03 4400.00 0.00 10.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.79605E-03 4425.00 0.00 10.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.78994E-03 4450.00 0.00 10.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.78391E-03 4475.00 0.00 5.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.77796E-03 4500.00 0.00 10.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.77208E-03 4525.00 0.00 10.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.76629E-03 4550.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.76056E-03 4575.00 0.00 5.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.75492E-03 4600.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.74934E-03 4625.00 0.00 25.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.74383E-03 4650.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0

1.000	1.50	0.35	0.50	10.0	310.0	2.0								
0.73840E-03	4675.00	0.00	15.0	Winter	0-360	10011001	-1.30	0.043	-9.000	0.020	-999.	21.	6.0	
1.000	1.50	0.35	0.50	10.0	310.0	2.0								
0.73303E-03	4700.00	0.00	0.0	Winter	0-360	10011001	-1.30	0.043	-9.000	0.020	-999.	21.	6.0	
1.000	1.50	0.35	0.50	10.0	310.0	2.0								
0.72773E-03	4725.00	0.00	25.0	Winter	0-360	10011001	-1.30	0.043	-9.000	0.020	-999.	21.	6.0	
1.000	1.50	0.35	0.50	10.0	310.0	2.0								
0.72250E-03	4750.00	0.00	5.0	Winter	0-360	10011001	-1.30	0.043	-9.000	0.020	-999.	21.	6.0	
1.000	1.50	0.35	0.50	10.0	310.0	2.0								
0.71733E-03	4775.00	0.00	0.0	Winter	0-360	10011001	-1.30	0.043	-9.000	0.020	-999.	21.	6.0	
1.000	1.50	0.35	0.50	10.0	310.0	2.0								
0.71222E-03	4800.00	0.00	5.0	Winter	0-360	10011001	-1.30	0.043	-9.000	0.020	-999.	21.	6.0	
1.000	1.50	0.35	0.50	10.0	310.0	2.0								
0.70718E-03	4825.00	0.00	15.0	Winter	0-360	10011001	-1.30	0.043	-9.000	0.020	-999.	21.	6.0	
1.000	1.50	0.35	0.50	10.0	310.0	2.0								
0.70220E-03	4850.00	0.00	5.0	Winter	0-360	10011001	-1.30	0.043	-9.000	0.020	-999.	21.	6.0	
1.000	1.50	0.35	0.50	10.0	310.0	2.0								
0.69728E-03	4875.00	0.00	0.0	Winter	0-360	10011001	-1.30	0.043	-9.000	0.020	-999.	21.	6.0	
1.000	1.50	0.35	0.50	10.0	310.0	2.0								
0.69241E-03	4900.00	0.00	5.0	Winter	0-360	10011001	-1.30	0.043	-9.000	0.020	-999.	21.	6.0	
1.000	1.50	0.35	0.50	10.0	310.0	2.0								
0.68761E-03	4924.99	0.00	15.0	Winter	0-360	10011001	-1.30	0.043	-9.000	0.020	-999.	21.	6.0	
1.000	1.50	0.35	0.50	10.0	310.0	2.0								
0.68287E-03	4950.00	0.00	5.0	Winter	0-360	10011001	-1.30	0.043	-9.000	0.020	-999.	21.	6.0	
1.000	1.50	0.35	0.50	10.0	310.0	2.0								
0.67818E-03	4975.00	0.00	15.0	Winter	0-360	10011001	-1.30	0.043	-9.000	0.020	-999.	21.	6.0	
1.000	1.50	0.35	0.50	10.0	310.0	2.0								
0.67354E-03	5000.00	0.00	5.0	Winter	0-360	10011001	-1.30	0.043	-9.000	0.020	-999.	21.	6.0	
1.000	1.50	0.35	0.50	10.0	310.0	2.0								

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

2656 29th Street, Suite 201
Santa Monica, CA 90405

Matt Hagemann, P.G, C.Hg.
(949) 887-9013
mhagemann@swape.com

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.

Geology:

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.

Teaching:

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.

Invited Testimony, Reports, Papers and Presentations:

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

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

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

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

SOIL WATER AIR PROTECTION ENTERPRISE
2656 29th Street, Suite 201
Santa Monica, California 90405
Attn: Paul Rosenfeld, Ph.D.
Mobil: (310) 795-2335
Office: (310) 452-5555
Fax: (310) 452-5550
Email: prosenfeld@swape.com

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. Thesis on wastewater treatment.

Professional Experience

Dr. Rosenfeld has over 25 years' 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:

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 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, 5-14-2021
Trial, October 8-4-2021

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

In the United States District Court For the Northern District of Illinois
Theresa Romcoe, Plaintiff vs. Northeast Illinois Regional Commuter Railroad Corporation d/b/a METRA Rail, Defendants
Case No.: 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., Plaintiff vs. The City of Pheonix v. Cox Cactus Farm, L.L.C., Utah Shelter Systems, Inc.
Case Number 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 *Plaintiffs*, vs. CNA Insurance Company et al.
Case Number 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, *Plaintiffs,* 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.: 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.: No. BC646857
Rosenfeld Deposition, 10-6-2018; Trial 3-7-19

In United States District Court For The District of Colorado
Bells et al. Plaintiff 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., Plaintiffs vs. Chevron Corporation, et al., Defendants
Cause No C12-01481
Rosenfeld Deposition, 11-20-2017

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

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

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

In the Northern District Court of Mississippi, Greenville Division
Brenda J. Cooper, et al., *Plaintiffs,* vs. Meritor Inc., et al., *Defendants*
Case Number: 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.: 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 N0. 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 Number 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 Number 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 Number: 2008 CT 10 0741 (Cons. w/ 2009 CV 10 0987)
Rosenfeld Deposition: October 2012

In the United States District Court for the Middle District of Alabama, Northern Division
James K. Benefield, et al., *Plaintiffs*, vs. International Paper Company, *Defendant*.
Civil Action Number 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 Number 2:07CV1052
Rosenfeld Deposition: July 2009