Justification/Reason for Appeal

Residences at Northridge Fashion Center

DIR-2021-7970-SPR-VHCA; ENV-2021-7971-CE

I. REASON FOR THE APPEAL

The Categorical Exemption prepared for Residences at Northridge Fashion Center Project (DIR-2021-7970-SPR-VHCA; ENV-2021-7971-CE) ("Project") fails to comply with the California Environmental Quality Act ("CEQA"). Furthermore, the approval of the Site Plan Review entitlements (DIR-2021-7970-SPR-VHCA) was in error because (1) the City of Los Angeles ("City") must fully comply with CEQA prior to any approvals in furtherance of the Project and (2) the findings are not supported by substantial evidence. Therefore, the City of Los Angeles ("City") must set aside the Site Plan Review entitlements and prepare circulate an EIR prior to considering approvals for the Project.

II. SPECIFICALLY THE POINTS AT ISSUE

The specific points at issue are set forth in the attached comment letter dated May 5, 2022. The Project does not qualify for a categorical exemption pursuant to Section 15332 of the CEQA Guidelines ("Infill Exemption"). Furthermore, proper CEQA review must be complete *before* the City approves the Project's entitlements. (*Orinda Ass'n. v. Bd. of Supervisors* (1986) 182 Cal.App.3d 1145, 1171 ["No agency may approve a project subject to CEQA until the entire CEQA process is completed and the overall project is lawfully approved."].) As such, the approval of the Project's Site Plan Review entitlements was in error. Additionally, by failing to properly conduct environmental review under CEQA, the City lacks substantial evidence to support its findings for the Site Plan Review entitlements.

III. HOW YOU ARE AGGRIEVED BY THE DECISION

Members of appellant Supporters Alliance for Environmental Responsibility ("SAFER") live and/or work in the vicinity of the proposed Project. They breathe the air, suffer traffic congestion, and will suffer other environmental impacts of the Project unless it is properly mitigated.

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

The City Planning Commission sustained the February 9, 2022 Planning Director's Determination, approved the Site Plan Review and approved a Categorical Exemption for the Project pursuant to Section 15332 of the CEQA Guidelines, despite a lack of substantial evidence in the record that the Project met the requirements for the Infill Exemption. Rather than exempt the Project from CEQA, the City should have prepared an initial study followed by an EIR or negative declaration in accordance with CEQA prior to consideration of approvals for the Project. The City is not permitted to approve the Project's entitlements until proper CEQA review has been completed.

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May 5, 2022

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Re: Opposition Comment to the California Environmental Quality Act Class 32 Categorical Exemption for the Residences at Northridge Fashion Center Project (Case No. ENV-2021-7971-CE)

Dear Honorable President Nam, Vice President Diaz, Commissioner Collado, Commissioner Parseghian, Commissioner Sampson, Mr. Claros, and Ms. Perez:

I am writing on behalf of Supporters Alliance for Environmental Responsibility ("SAFER") regarding the California Environmental Quality Act ("CEQA") Class 32 (In-fill Development) Categorical Exemption prepared for the Residences at Northridge Fashion Center Project (Case No. ENV-2021-7971-CE), including all actions related or referring to the proposed construction, use, and maintenance of a new five-story 309,169-square-foot residential development with 350 dwelling units, and an adjoining parking garage, located at 9450 N. Shirley Avenue, Los Angeles, CA 91324 ("Project").

After reviewing the CEQA Class 32 (In-fill Development) Categorical Exemption Report ("CE" or "Exemption"), we conclude that the City of Los Angeles ("City") cannot rely on the Exemption because the Project will have significant adverse environmental impacts on air quality. As evidenced by the expert comments submitted by Certified Industrial Hygienist Francis Offermann, PE, CIH, and environmental consulting firm Soil/Water/Air Protection Enterprise ("SWAPE"), the Exemption is inapplicable because (1) the Class 32 exemption does not apply on its face, and (2) the unusual circumstances exception to the exemption applies. Mr.

Offermann's comment and curriculum vitae are attached as Exhibit A hereto and are incorporated herein by reference in their entirety. SWAPE's comment and curriculum vitae are attached as Exhibit B hereto and are incorporated herein by reference in their entirety.

Since the Project is not exempt from CEQA, an initial study must be prepared to determine the appropriate level of CEQA review required.

I. PROJECT DESCRIPTION

The Project includes demolition and removal of all existing uses from the Project site and development of the site with an approximately 309,169-square-foot residential building and an adjoining parking garage. The 28 trees on the Project site and potentially some or all of the 6 trees adjacent to the site will be removed and replaced.

The residential building would be five stories with a maximum building height of 75 feet (including rooftop appurtenances) and would include 350 dwelling units, with a unit mix including 92 studio units, 176 one-bedroom units, and 82 two-bedroom units. Primary access to the residential building would be provided via a lobby/leasing/mail area at the southeast corner of the building, with internal resident access provided from the parking garage to the residential building.

The parking garage will be six levels with a maximum building height of 75 feet (including rooftop appurtenances) and would include 466 vehicle parking spaces plus an additional 38 adjacent surface vehicle parking spaces, for a total of 504 vehicle parking spaces, and 208 long-term bicycle parking spaces and 16 short-term bicycle parking spaces, for a total of 224 bicycle parking spaces. Vehicular access to the parking garage would be provided via one driveway on Shirley Avenue.

The Project provides 37,300 square feet of open space, including a combination of courtyards, a roof deck, private balconies and patios, and indoor recreation areas.

This Project involves a 4.78-acre (208,367 square feet) site. The Project site is located at 9450 N. Shirley Avenue at the Northridge Fashion Center near the southeast corner of Plummer Street and Shirley Street in the Chatsworth-Porter Ranch Community Plan area of the City of Los Angeles ("City"). The Assessor Parcel Number (APN) for the Project site is 2761-037-030. The Project site is bounded by surface parking associated with the Northridge Fashion Center and Plummer Street to the north, Shirley Avenue to the west, and additional Northridge Fashion Center surface parking to the east and south. The greater site area is developed with a single-family residential neighborhood to the north across Plummer Street; various commercial and retail uses to the west, south, and east; and storage and multi-family residential uses to the southwest.

Regional access to the Project site is provided by State Route 118 located approximately 2.0 miles to the north and Interstate 405 located approximately 5.0 miles to the east. The site is zoned C4-1 (Commercial Zone, Height District 1), with a corresponding General Plan land use designation of Regional Center Commercial.

The Project site is currently developed with a one-story, 4,168-square-foot bank building (currently operational) and surface parking. There are 28 trees on the Project site and 6 off-site trees located near the site, including the following:

- 1 jacaranda (*Jacaranda mimosifolia*)
- 13 evergreen pear (*Pyrus kawakamii*)
- 14 Mexican fan palm (*Washingtonia robusta*)
- 4 southern magnolia (*Magnolia grandiflora*)
- 2 carrotwood (*Cupaniopsis anacardiodes*)

To allow for development of the Project, the Project Applicant is seeking the following discretionary approvals from the City:

Site Plan Review (SPR) pursuant to LAMC Section 16.05 for a Project that results in the creation of greater than 50 net new residential dwelling units.

Pursuant to various sections of the LAMC and other City requirements, the Applicant will request approvals and permits from the Building and Safety Department (and other municipal agencies) for Project construction actions including, but not limited to: demolition, excavation and export, shoring, grading, foundation, and building and tenant improvements.

II. LEGAL STANDARD

As the California Supreme Court has held, "[i]f no EIR has been prepared for a nonexempt project, but substantial evidence in the record supports a fair argument that the project may result in significant adverse impacts, the proper remedy is to order preparation of an EIR." (*Communities for a Better Env't v. South Coast Air Quality Mgmt. Dist.* (2010) 48 Cal.4th 310, 319-20 ["*CBE v. SCAQMD*"] [citing *No Oil, Inc. v. City of Los Angeles* (1974) 13 Cal.3d 68, 75, 88]; *Brentwood Assn. for No Drilling, Inc. v. City of Los Angeles* (1982) 134 Cal.App.3d 491, 504–505.) "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 mitigated negative declaration 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.)

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.)

Lastly, to achieve its objectives of environmental protection, CEQA has a three-tiered structure. (14 CCR § 15002(k); *Committee to Save the Hollywoodland Specific Plan v. City of Los Angeles* (2008) 161 Cal.App.4th 1168, 1185-86 ["*Hollywoodland*"].) First, if a project falls into an exempt category, or it can be seen with certainty that the activity in question will not have a significant effect on the environment, no further agency evaluation is required. (*Id.*) Second, if there is a possibility the project will have a significant effect on the environment, the agency must perform an initial threshold study. (*Id.*; 14 CCR § 15063(a).) If the study indicates that there is no substantial evidence that the project or any of its aspects may cause a significant effect on the environment the agency may issue a negative declaration. (*Id.*; 14 CCR §§ 15063(b)(2), 15070.) Finally, if the project will have a significant effect on the environment, an EIR is required. (*Id.*) Here, since the City exempted the Project from CEQA entirely, the first step of the CEQA process applies.

CEQA identifies certain classes of projects which are exempt from the provisions of CEQA. These are called categorical exemptions. (14 CCR §§ 15300, 15354.) "Exemptions to CEQA are narrowly construed and '[e]xemption categories are not to be expanded beyond the reasonable scope of their statutory language.' [Citations]." (*Mountain Lion Foundation v. Fish & Game Com.* (1997) 16 Cal.4th 105, 125.) The determination as to the appropriate scope of a categorical exemption is a question of law subject to independent, or de novo, review. (*San Lorenzo Valley Community Advocates for Responsible Education v. San Lorenzo Valley Unified School Dist.*, (2006) 139 Cal. App. 4th 1356, 1375 ["[Q]uestions of interpretation or application of the requirements of CEQA are matters of law. [Citations.] Thus, for example, interpreting the scope of a CEQA exemption presents 'a question of law, subject to de novo review by this court.' [Citations]."].) In addition, there are several exceptions to CEQA's categorical exemptions. (See, 14 CCR § 15300.2.)

III. ANALYSIS

A. The City Incorrectly Applied CEQA's Class 32 (In-Fill Development) Categorical Exemption to the Project and Thus a Full CEQA Analysis Is Required.

The proposed Project does not qualify for a Class 32 (in-fill development) categorical exemption under CEQA because of the Project's significant environmental impacts. The City must prepare an Initial Study to determine the appropriate level of CEQA review, be it a mitigated negative declaration or an environmental impact report.

1. The Class 32 Exemption Does Not Apply on its Face.

The City is relying on the Class 32 (in-fill development) categorical exemption for this project. The Class 32 exemption provides:

> Class 32 consists of projects characterized as in-fill development meeting the conditions described in this section.
>
> (a) The project is consistent with the applicable general plan designation and all applicable general plan policies as well as with applicable zoning designation and regulations.
> (b) The proposed development occurs within city limits on a project site of no more than five acres substantially surrounded by urban uses.
> (c) The project site has no value, as habitat for endangered, rare or threatened species.
> (d) ***Approval of the project would not result in any significant effects relating to*** traffic, noise, ***air quality***, or water quality.
> (e) The site can be adequately served by all required utilities and public services.

(14 CCR § 15332 [emph. added].)

One of the key limitations of the Class 32 exemption is that it does not apply if the project will have any significant effects relating to traffic, noise, air quality, or water quality. (14 CCR § 15332(d).) Here, the exemption cannot apply because the Project will have significant impacts on air quality.

i. The Project Will Have Significant Air Quality Impacts, Precluding Reliance on the Class 32 Exemption.

In support of the Exemption, the City relies on emissions calculated with CalEEMod.2020.4.0. (Ex. B, p. 2; CE, pp. 31-32.) This model relies on recommended default values, or on site-specific information related to a number of factors. When more specific project information is known, the user may change the default values and input project-specific values, but CEQA requires that such changes be justified by substantial evidence. The model is used to generate a project's construction and operational emissions. SWAPE reviewed the Project's CalEEMod output files provided in the Air Quality Modeling Results ("AQ Modeling Results") as Appendix D to the Exemption, and found that several model inputs used to generate a project's construction and operation emissions were not consistent with information disclosed in the Exemption. (Ex. B, p. 2.) As a result, SWAPE concludes that the Project's construction and operational emissions are underestimated. (*Id.*) Because the Exemption uses incorrect estimates for emissions, its air quality analysis cannot be relied upon to determine the Project's emissions. The particular errors identified by SWAPE are discussed below. These errors should be corrected in a subsequent CEQA document prior to approval of the Project. SWAPE's expert comments and curriculum vitae are attached hereto as Exhibit B.

Specifically, SWAPE found that several values used in the Exemption and AQ Modeling Results' air quality analysis were either inconsistent with information provided in the Exemption or otherwise unjustified (Ex. B, pp. 2-6), including:

1. Failure to Model Proposed Surface Parking. (Ex. B, pp. 2-3.)
2. Unsubstantiated Changes to Individual Construction Phase Lengths. (Ex. B, pp. 3-5.)
3. Unsubstantiated Reduction to Acres of Grading Value. (Ex. B, pp. 5-6.)

An initial study and mitigated negative declaration or environmental impact report is needed to adequately address the air quality impacts of the proposed Project, and to mitigate those impacts accordingly.

To more accurately determine the Project's construction-related emissions, SWAPE prepared an updated CalEEMod model using the Project-specific information provided by the Exemption. (See, Ex. B, pp. 6-7.) SWAPE's updated analysis demonstrates that the Project's construction-related VOC and NO_x emissions increase by approximately 339% and 157%, respectively, and exceed the appreciable South Coast Air Quality Management District's ("SCAQMD") significance threshold of 75- and 100-pounds per day ("lbs/day"). Thus, SWAPE's model demonstrates that the Project would result in a significant air quality impact, which precludes reliance on a Class 32 Exemption. (14 CCR § 15332(d).)

ii. The Project Will Have a Significant Health Risk Impact from Indoor Air Quality Impacts, Precluding Reliance on the Class 32 Exemption.

Certified Industrial Hygienist, Francis "Bud" Offermann, PE, CIH, has conducted a review of the proposed Project and relevant documents regarding the Project's indoor air emissions. Indoor Environmental Engineering Comments (March 14, 2022) (Exhibit A). Mr. Offermann concludes that it is likely that the Project will expose residents and commercial employees of the Project to significant impacts related to indoor air quality, and in particular, emissions of the cancer-causing chemical formaldehyde. Mr. Offermann is a leading expert on indoor air quality and has published extensively on the topic. Mr. Offermann's expert comments and curriculum vitae are attached as Exhibit A.

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

Formaldehyde is a known human carcinogen. Mr. Offermann states that there is a fair argument that future residents and employees of the commercial spaces will be exposed to a cancer risk from formaldehyde of approximately 120 per million, assuming all materials are compliant with the California Air Resources Board's formaldehyde airborne toxics control measure. (*Id.*, pp. 3-4.) This exceeds the SCAQMD CEQA significance threshold for airborne cancer risk of 10 per million. (*Id.*, pp. 2, 4.)

Mr. Offermann also notes that the high cancer risk that may be posed by the Project's indoor air emissions likely will be exacerbated by the additional cancer risk that exists as a result of the Project's location near roadways with moderate to high traffic (i.e. Shirley Avenue, Plummer Street, Corbin Avenue, Tampa Avenue, Nordoff Street, etc.) and the high levels of PM 2.5 already present in the ambient air. (*Id.*, pp. 11-12.)

This air quality impact precludes the applicability of the Class 32 Exemption. (14 CCR § 15332(d).)

iii. The Project Will Have a Significant Health Impact as a Result of Diesel Particulate Emissions into the Air.

SWAPE analyzed the Project's emissions of Diesel Particulate Matter (DPM) into the air, and that resulting impact on human health. To do so, SWAPE prepared a screening-level Health Risk Assessment ("HRA") to evaluate potential impacts from the construction and operation of the Project. (Ex. B, pp. 9-13.) SWAPE prepared a screening-level HRA to evaluate potential health risk impacts posed to residential sensitive receptors as a result of the Project's construction-related and operational TAC emissions. SWAPE used AERSCREEN, the leading screening-level air quality dispersion model. SWAPE applied a sensitive receptor distance of 100 meters and analyzed impacts to individuals at different stages of life based on OEHHA and SCAQMD guidance utilizing age sensitivity factors.

SWAPE found that the excess cancer risks at a sensitive receptor located approximately 100 meters away over the course of Project construction and operation, while utilizing the recommended age sensitivity factors, are approximately 125 in one million for infants and 75.3 in one million for children, (Ex. B, p. 12.) Moreover, the excess cancer risk over the course of a residential lifetime (i.e. 30 years) for Project operation and construction is approximately 214 in one million. (*Id.*) The cancer risks to infants, children, and lifetime residents appreciably exceed SCAQMD's threshold of 10 in one million, thus indicating a significant air quality impact.

Because the Project will have numerous significant air quality impacts, the Class 32 exemption is inapplicable on its face and cannot be relied on by the City.

2. The Unusual Circumstances Exception Precludes Reliance on the Class 32 Exemption.

A categorical exemption is inapplicable “where there is a reasonable possibility that the activity will have a significant effect on the environment due to unusual circumstances.” (14 CCR 15300.2(c).) Here, the Project does not present the same general risk of environmental impacts as other projects falling under Class 32 exemptions and therefore the exemption cannot apply.

In *Berkeley Hillside*, the California Supreme Court explained that there are two ways a party may invoke the unusual circumstances exception. First, “a party may establish an unusual circumstance with evidence that the project *will* have a significant environmental effect. That evidence, if convincing, necessarily also establishes ‘a reasonable possibility that the activity will have a significant effect on the environment due to unusual circumstances.’” (*Berkeley Hillside Preservation v. City of Berkeley* (2015) 60 Cal.4th 1086, 1105 [emph. added].) Alternatively, “[a] party invoking the exception may establish an unusual circumstance without evidence of an environmental effect, by showing that the project has some feature that distinguishes it from others in the exempt class, such as its size or location. In such a case, to render the exception applicable, the party need only show a reasonable possibility of a significant effect due to that unusual circumstance.” (*Id*.)

As discussed above, we have submitted substantial evidence that the Project will have significant air quality impacts. The fact that these significant impacts will occur constitutes an unusual circumstance. Precluding the City’s reliance on an exemption.

IV. CONCLUSION

The City cannot rely in on a Class 32 exemption because the Project does not meet the terms of the exemption and because the unusual circumstances exception to exemptions applies. Accordingly, the City must prepare an initial study to determine the appropriate level of environmental review to undertake pursuant to CEQA. Thank you for considering these comments.

Sincerely,

Victoria Yundt
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EXHIBIT A

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Date: March 14, 2022

To: Victoria Yundt
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From: Francis J. Offermann PE CIH

Subject: Indoor Air Quality: Residences at Northridge Fashion Center, Mixed Use Project, Los Angeles, CA (IEE File Reference: P-4554)

Pages: 19

Indoor Air Quality Impacts

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

The concentrations of many air pollutants often are elevated in homes and other buildings relative to outdoor air because many of the materials and products used indoors contain and release a variety of pollutants to air (Hodgson et al., 2002; Offermann and Hodgson, 2011). With respect to indoor air contaminants for which inhalation is the primary route of exposure, the critical design and construction parameters are the provision of adequate ventilation and the reduction of indoor sources of the contaminants.

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

Therefore, the cancer risk of a resident living in a California home with the median indoor formaldehyde concentration of 36 µg/m^3, is 180 per million as a result of formaldehyde alone. The CEQA significance threshold for airborne cancer risk is 10 per million, as established by the South Coast Air Quality Management District (SCAQMD, 2015).

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

The primary source of formaldehyde indoors is composite wood products manufactured with urea-formaldehyde resins, such as plywood, medium density fiberboard, and particleboard. These materials are commonly used in building construction for flooring, cabinetry, baseboards, window shades, interior doors, and window and door trims.

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

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

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

With respect to the Residences at Northridge Fashion Center, Mixed Use Project, Los Angeles, CA, the buildings consist of residential and commercial spaces.

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

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

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

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

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

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

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

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

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

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

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

Pre-Construction Building Material/Furnishing Formaldehyde Emissions Assessment

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

1.) Define Indoor Air Quality Zones. Divide the building into separate indoor air quality zones, (IAQ Zones). IAQ Zones are defined as areas of well-mixed air. Thus, each ventilation system with recirculating air is considered a single zone, and each room or group of rooms where air is not recirculated (e.g. 100% outdoor air) is considered a separate zone. For IAQ Zones with the same construction material/furnishings and design minimum outdoor air ventilation rates. (e.g. hotel rooms, apartments, condominiums, etc.) the formaldehyde emission rates need only be assessed for a single IAQ Zone of that type.

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

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

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

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

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

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

4.) Calculate the Total Formaldehyde Emission Rate. For each IAQ Zone, calculate the total formaldehyde emission rate (i.e. µg/h) from the individual formaldehyde emission rates from each of the building material/furnishings as determined in Step 3.

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

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

where:

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

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

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

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

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

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

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

Source mitigation for formaldehyde may include:

1.) reducing the amount materials and/or furnishings that emit formaldehyde

2.) substituting a different material with a lower area-specific emission rate of formaldehyde

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

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

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

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

Outdoor Air Ventilation Impact. Another important finding of the CNHS, was that the outdoor air ventilation rates in the homes were very low. Outdoor air ventilation is a very important factor influencing the indoor concentrations of air contaminants, as it is the primary removal mechanism of all indoor air generated contaminants. Lower outdoor air exchange rates cause indoor generated air contaminants to accumulate to higher indoor air concentrations. Many homeowners rarely open their windows or doors for ventilation as a result of their concerns for security/safety, noise, dust, and odor concerns (Price, 2007). In the CNHS field study, 32% of the homes did not use their windows during the 24-hour Test Day, and 15% of the homes did not use their windows during the entire preceding week. Most of the homes with no window usage were homes in the winter field session. Thus, a substantial percentage of homeowners never open their windows, especially in the winter season. The median 24-hour measurement was 0.26 air changes per hour (ach), with a range of 0.09 ach to 5.3 ach. A total of 67% of the homes had outdoor air exchange rates below the minimum California Building Code (2001) requirement of 0.35 ach. Thus, the relatively tight envelope construction, combined with the fact that many people never open their windows for ventilation, results in homes with low outdoor air exchange rates and higher indoor air contaminant concentrations.

According to the Categorical Exemption, Residences at Northridge Fashion Center (CAJA Environmental Services, 2022), the Project is close to roads with moderate to high traffic (e.g., Shirley Avenue, Plummer Street, Corbin Avenue, Tampa Avenue, Nordoff Street, etc.). Table 6 reports that the existing ambient short-term (15 minute) noise measurements measured on February 29, 2021 range from 60.6 to 61.3 dBA Leq. It should be noted that due to the ongoing Coronavirus pandemic, traffic volumes on local roads are likely lower than usual. Therefore, noise measurements that were conducted in February 2021 are likely lower than pre-pandemic conditions and therefore likely underestimate the existing noise environment. In addition, the future noise levels will likely be higher with future increases in traffic. Longer term 24-hour acoustic measurements should be conducted to determine the CNEL and/or L_{dn} so as to understand what STL will be required for windows and doors to achieve acceptable indoor noise levels. As a result the Project site is a sound impacted site.

As a result of the high outdoor noise levels, the current project will require a mechanical supply of outdoor air ventilation to allow for a habitable interior environment with closed windows and doors. Such a ventilation system would allow windows and doors to be kept closed at the occupant's discretion to control exterior noise within building interiors.

$PM_{2.5}$ Outdoor Concentrations Impact. An additional impact of the nearby motor vehicle traffic associated with this project, are the outdoor concentrations of $PM_{2.5}$. According to the Categorical Exemption, Residences at Northridge Fashion Center, (CAJA Environmental Services, 2022), the Project is located in the South Coast Air Basin, which is a State and Federal non-attainment area for $PM_{2.5}$.

An air quality analyses should to be conducted to determine the concentrations of $PM_{2.5}$ in the outdoor and indoor air that people inhale each day. This air quality analyses needs to consider the cumulative impacts of the project related emissions, existing and projected future emissions from local $PM_{2.5}$ sources (e.g. stationary sources, motor vehicles, and airport traffic) upon the outdoor air concentrations at the Project site. If the outdoor concentrations are determined to exceed the California and National annual average $PM_{2.5}$

exceedence concentration of 12 $\mu g/m^3$, or the National 24-hour average exceedence concentration of 35 $\mu g/m^3$, then the buildings need to have a mechanical supply of outdoor air that has air filtration with sufficient removal efficiency, such that the indoor concentrations of outdoor $PM_{2.5}$ particles is less than the California and National $PM_{2.5}$ annual and 24-hour standards.

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

Indoor Air Quality Impact Mitigation Measures

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

Indoor Formaldehyde Concentrations Mitigation. Use only composite wood materials (e.g. hardwood plywood, medium density fiberboard, particleboard) for all interior finish systems that are made with CARB approved no-added formaldehyde (NAF) resins (CARB, 2009). CARB Phase 2 certified composite wood products, or ultra-low emitting formaldehyde (ULEF) resins, do not insure indoor formaldehyde concentrations that are below the CEQA cancer risk of 10 per million. Only composite wood products manufactured with CARB approved no-added formaldehyde (NAF) resins, such as resins made from soy, polyvinyl acetate, or methylene diisocyanate can insure that the OEHHA cancer risk of 10 per million is met.

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

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

Outdoor Air Ventilation Mitigation. Provide each habitable room with a continuous mechanical supply of outdoor air that meets or exceeds the California 2016 Building Energy Efficiency Standards (California Energy Commission, 2015) requirements of the greater of 15 cfm/occupant or 0.15 cfm/ft^2 of floor area. Following installation of the system conduct testing and balancing to insure that required amount of outdoor air is entering each habitable room and provide a written report documenting the outdoor airflow rates. Do not use exhaust only mechanical outdoor air systems, use only balanced outdoor air supply and exhaust systems or outdoor air supply only systems. Provide a manual for the occupants or maintenance personnel, that describes the purpose of the mechanical outdoor air system and the operation and maintenance requirements of the system.

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

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APPENDIX A

INDOOR FORMALDEHYDE CONCENTRATIONS AND THE CARB FORMALDEHYDE ATCM

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

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

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

For this calculation I utilized the floor area (2,272 ft^2), the ceiling height (8.5 ft), and the number of bedrooms (4) as defined in Appendix B (New Single-Family Residence Scenario) of the Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions for Indoor Sources Using Environmental Chambers, Version 1.1, 2017, California

Department of Public Health, Richmond, CA. https://www.cdph.ca.gov/Programs/CCDPHP/DEODC/EHLB/IAQ/Pages/VOC.aspx.

For the outdoor air ventilation rate I used the 2019 Title 24 code required mechanical ventilation rate (ASHRAE 62.2) of 106 cfm (180 m^3/h) calculated for this model residence. For the composite wood formaldehyde emission rates I used the CARB ATCM Phase 2 rates.

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

Medium Density Fiberboard (MDF) – 15 ft^2 (0.7% of the floor area), or
Particle Board – 30 ft^2 (1.3% of the floor area), or
Hardwood Plywood – 54 ft^2 (2.4% of the floor area), or
Thin MDF – 46 ft^2 (2.0 % of the floor area).

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

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

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

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

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

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

EXHIBIT B

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

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May 3, 2022

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Subject: Comments on the Residences at Northridge Fashion Center Project (Case No. ENV-2021-7971-CE)

Dear Ms. Yundt,

We have reviewed the January 2022 Categorical Exemption ("Exemption") for the Residences at Northridge Fashion Center Project ("Project") located in the City of Los Angeles ("City"). The Project proposes to demolish a 4,168-square-foot ("SF") building and surface parking, as well as construct a 309,169-SF residential building with 350 dwelling units and 504 parking spaces on the 4.78-acre site.

Our review concludes that the Exemption fails to adequately evaluate the Project's air quality, health risk, and greenhouse gas impacts. As a result of our findings, the proposed Project does not qualify for a Class 32 Categorical Exemption under the California Environmental Quality Act ("CEQA") and 14 Cal. Code of Regs. 1500 et seq. ("CEQA Guidelines") and, therefore, a full CEQA analysis must 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.

Air Quality

Incorrect Reliance on Class 32 Categorical Exemption

The Exemption claims that the Project is categorically exempt pursuant to CEQA Guidelines § 15332, stating:

> "For the reasons discussed in this document, the Project is categorically exempt from the requirement for the preparation of environmental documents under Class 32 in Section 15332, Article 19, Chapter 3, Title 14 of the California Code of Regulations. Class 32 is intended to promote infill development within urbanized areas. The class consists of environmentally benign

in-fill projects that are consistent with local general plan and zoning requirements. Class 32 is not intended to be applied to projects that would result in any significant traffic, noise, air quality, or water quality effects. Application of this exemption, as all categorical exemptions, is limited by certain exceptions identified in Section 15300.2 of the CEQA Guidelines" (p. 6).

As demonstrated above, according to CEQA Guidelines § 15332, a project can only be characterized as an in-fill development and qualify for a Class 32 Categorical Exemption if approval of the project would not result in any significant effects relating to traffic, noise, air quality, or water quality. The Exemption claims that the Project would result in less-than-significant air quality impacts. However, this claim is unsubstantiated and the Project's air quality analysis is insufficient for the following four reasons:

(1) The Exemption relies upon an incorrect and unsubstantiated air model;
(2) SWAPE's updated analysis indicates a potentially significant air quality impact;
(3) The Exemption fails to adequately evaluate the Project's health risk impacts; and
(4) SWAPE's screening-level health risk assessment indicates a potentially significant health risk impact.

1) Incorrect and Unsubstantiated Air Model

The Exemption's air quality analysis relies on emissions calculated with the California Emissions Estimator ("CalEEMod") Version 2020.4.0 (p. 31, 32).[1] CalEEMod provides recommended default values based on site-specific information, such as land use type, meteorological data, total lot acreage, project type and typical equipment associated with project type. If more specific project information is known, the user can change the default values and input project-specific values, but the California Environmental Quality Act ("CEQA") requires that such changes be justified by substantial evidence. Once all of the values are inputted into the model, the Project's construction and operational emissions are calculated, and "output files" are generated. These output files disclose to the reader what parameters are utilized in calculating the Project's air pollutant emissions and make known which default values are changed as well as provide justification for the values selected.

When reviewing the Project's CalEEMod output files, provided in the Air Quality Modeling Results as Appendix D to the Exemption, we found that several model inputs were not consistent with information disclosed in the Exemption. As a result, the Project's construction and operational emissions are underestimated. A full CEQA analysis 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 Model Proposed Surface Parking

According to the Exemption:

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

> "The parking garage would be six levels with a maximum building height of 75 feet (including rooftop appurtenances) and would include 466 vehicle parking spaces plus an additional 38 adjacent surface vehicle parking spaces, for a total of 504 vehicle parking spaces" (p. 3).

As such, the model should have included 38 surface parking spaces in addition to the 466 garage parking spaces. However, review of the CalEEMod output files demonstrates that the "NFC – Future" model fails to include any surface parking whatsoever (see excerpt below) (Appendix D, pp. 295, 333, 366).

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Apartments Mid Rise	350.00	Dwelling Unit	2.48	323,941.00	1001
Unenclosed Parking with Elevator	468.00	Space	0.82	193,625.00	0

As you can see in the excerpt above, the model fails to include the 38 proposed surface parking spaces. This underestimation presents an issue, as the square footage of parking land uses is used for certain calculations such as determining the area to be painted and stripped (i.e., VOC emissions from architectural coatings) and area to include lighting (i.e., energy impacts).[2] Thus, by underestimating the proposed parking land use, the model underestimates the Project's construction-related and operational emissions and should not be relied upon to determine Project significance.

Unsubstantiated Changes to Individual Construction Phase Lengths

Review of the CalEEMod output files demonstrates that the "NFC – Future" model includes several changes to the default individual construction phase lengths (see excerpt below) (Appendix D, pp. 296, 334, 367).

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	18.00	90.00
tblConstructionPhase	NumDays	230.00	500.00
tblConstructionPhase	NumDays	20.00	11.00
tblConstructionPhase	NumDays	8.00	36.00
tblConstructionPhase	NumDays	18.00	5.00
tblConstructionPhase	PhaseEndDate	1/23/2024	3/6/2025
tblConstructionPhase	PhaseEndDate	12/4/2023	1/3/2025
tblConstructionPhase	PhaseEndDate	12/28/2022	12/15/2022
tblConstructionPhase	PhaseEndDate	1/16/2023	2/3/2023
tblConstructionPhase	PhaseStartDate	12/29/2023	11/1/2024
tblConstructionPhase	PhaseStartDate	1/17/2023	2/6/2023
tblConstructionPhase	PhaseStartDate	1/5/2023	12/16/2022

As a result of these changes, the model includes the following construction schedule (see excerpt below) (Appendix B, pp. 301, 339, 372):

[2] "CalEEMod User's Guide." California Air Pollution Control Officers Association (CAPCOA), May 2021, *available at:* https://www.aqmd.gov/caleemod/user's-guide, p. 2.

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days
1	Demolition	Demolition	12/1/2022	12/15/2022	5	11
2	Grading	Grading	12/16/2022	2/3/2023	5	36
3	Building Construction	Building Construction	2/6/2023	1/3/2025	5	500
4	Architectural Coating	Architectural Coating	11/1/2024	3/6/2025	5	90
5	Paving	Paving	3/3/2025	3/7/2025	5	5

As you can see from the excerpt above, the demolition phase is decreased by 45%, from the default value of 20 to 11 days; grading phase is increased by 350%, from the default value of 8 to 36 days; the building construction phase is increased by 117%, from the default value of 230 to 500 days; the architectural coating phase is increased by 400%, from the default value of 18 to 90 days; and the paving phase is decreased by 72%, from the default value of 18 to 5 days. As previously mentioned, the CalEEMod User's Guide requires any changes to model defaults be justified.[3] According to the "User Entered Comments & Non-Default Data" table, the justification provided for these changes is:

> "Applicant info" (Appendix D, pp. 295, 333, 366).

Furthermore, regarding the Project's anticipated construction schedule, the Exemption states:

> "Table 9 summarizes the estimated construction schedule that was used to model the Project's air quality impacts" (p. 30).

As such, the Exemption includes the following construction schedule included in the model (see excerpt below) (p. 31, Table 9):

Table 9
Estimated Construction Schedule

Phase	Duration
Demolition	~2 weeks
Grading	~1.5 month
Building Construction	23 months
Architectural Coatings	4 months[1]
Paving	1 week
[1] *The application of architectural coatings would partially overlap with the building construction phase.*	

However, these changes remain unsupported. The above-mentioned table is only a reflection of the phase lengths included in the model and fails to provide any concrete evidence to support the changes to the default values. This is incorrect, as according to the CalEEMod User's Guide:

[3] "CalEEMod User's Guide." California Air Pollution Control Officers Association (CAPCOA), May 2021, *available at:* http://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." [4]

Here, the Exemption fails to provide substantial evidence to support the revised individual construction phase lengths. Absent additional information from the Applicant or construction contractor, we cannot verify the changes.

These unsubstantiated changes present an issue, as the construction emissions are improperly spread out over a longer period of time for some phases, but not for others. According to the CalEEMod User's Guide, each construction phase is associated with different emissions activities (see excerpt below).[5]

> *Demolition* involves removing buildings or structures.
>
> *Site Preparation* involves clearing vegetation (grubbing and tree/stump removal) and removing stones and other unwanted material or debris prior to grading.
>
> *Grading* involves the cut and fill of land to ensure that the proper base and slope is created for the foundation.
>
> *Building Construction* involves the construction of the foundation, structures and buildings.
>
> *Architectural Coating* involves the application of coatings to both the interior and exterior of buildings or structures, the painting of parking lot or parking garage striping, associated signage and curbs, and the painting of the walls or other components such as stair railings inside parking structures.
>
> *Paving* involves the laying of concrete or asphalt such as in parking lots, roads, driveways, or sidewalks.

Thus, by disproportionately altering and extending some of the individual construction phase lengths without proper justification, the model assumes there are a greater number of days to complete the construction activities required by the prolonged phases. As such, there will be less construction activities required per day and, consequently, less pollutants emitted per day. As a result, the model may underestimate the peak daily emissions associated with some phases of construction and should not be relied upon to determine Project significance.

Unsubstantiated Reduction to Acres of Grading Value

Review of the CalEEMod output files demonstrates that the "NFC – Future" model includes a manual reduction the default acres of grading value (see excerpt below) (Appendix D, pp. 296, 334, 367).

Table Name	Column Name	Default Value	New Value
tblGrading	AcresOfGrading	36.00	1.00

[4] "CalEEMod User's Guide." California Air Pollution Control Officers Association (CAPCOA), May 2021, *available at:* http://www.aqmd.gov/caleemod/user's-guide, p. 13, 14.

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

As you can see from the excerpt above, the acres of grading value is reduced by approximately 97%, from the default value of 36- to 1-acre. As previously mentioned, the CalEEMod User's Guide requires any changes to model defaults be justified.[6] According to the "User Entered Comments & Non-Default Data" table, the justification provided for these changes is:

> "Applicant info" (Appendix D, pp. 295, 333, 366).

However, the Exemption fails to mention the revised acres of grading value or substantiate this reduction whatsoever. This is incorrect, as according to the CalEEMod User's Guide:

> "CalEEMod was also designed to allow the user to change the defaults to reflect site- or project-specific information, when available, provided that the information is supported by substantial evidence as required by CEQA." [7]

Here, as the Exemption fails to provide substantial evidence to support the revised acres of grading value, we cannot verify the change. Additionally, the CalEEMod User's Guide states:

> "[T]he dimensions (e.g., length and width) of the grading site have no impact on the calculation, only the total area to be graded. In order to properly grade a piece of land multiple passes with equipment may be required. The acres is based on the equipment list and days in grading or site preparation phase according to the anticipated maximum number of acres a given piece of equipment can pass over in an 8-hour workday."[8]

As demonstrated above, the acres of grading value is based on construction equipment and the length of the grading and site preparation phases. Thus, as the dimensions of the Project site have no impact on the acres of grading value, the reduction remains unsupported.

This unsubstantiated reduction presents an issue, as CalEEMod uses the acres of grading value to estimate the dust emissions associated with grading.[9] Thus, by including an unsubstantiated reduction to the default acres of grading value, the model may underestimate the Project's construction-related emissions and should not be relied upon to determine Project significance.

2) 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 updated an CalEEMod model, using the Project-specific information provided by the

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[6] "CalEEMod User's Guide Version 2020.4.0." California Air Pollution Control Officers Association (CAPCOA), May 2021, *available at:* https://www.aqmd.gov/caleemod/user's-guide, p. 1, 14.
[7] "CalEEMod User's Guide Version 2020.4.0." California Air Pollution Control Officers Association (CAPCOA), May 2021, *available at:* https://www.aqmd.gov/caleemod/user's-guide, p. 13-14.
[8] "Appendix A Calculation Details for CalEEMod." California Air Pollution Control Officers Association (CAPCOA), May 2021, *available at:* http://www.aqmd.gov/caleemod/user's-guide, p. 9.
[9] "Appendix A Calculation Details for CalEEMod." California Air Pollution Control Officers Association (CAPCOA), May 2021, *available at:* https://www.aqmd.gov/caleemod/user's-guide, p. 9.

Exemption. In our updated model, we included the proposed surface parking and omitted the unsubstantiated changes to the individual construction phase lengths and acres of grading value.[10]

Our updated analysis estimates that the VOC and NO_X emissions associated with Project construction exceed the applicable South Coast Air Quality Management District ("SCAQMD") thresholds of 75- and 100-pounds per day ("lbs/day"), respectively, as referenced by the Exemption (p. 31, Table 10) (see table below).

SWAPE Criteria Air Pollutant Emissions		
Construction	**ROG** (lbs/day)	**NO_X** (lbs/day)
Exemption	26.5	40.3
SWAPE	116.5	103.5
% Increase	339%	157%
SCAQMD Threshold	**75**	**100**
Exceeds?	***Yes***	***Yes***

As demonstrated above, construction-related VOC and NO_X emissions, as estimated by SWAPE, increase by approximately 339% and 157%, respectively, and exceed the applicable SCAQMD significance thresholds. Thus, our updated modeling demonstrates that the Project would result in a potentially significant air quality impact that was not previously identified or addressed by the Exemption. As a result, the Project is ineligible for a Class 32 Categorical Exemption and a full CEQA analysis should be prepared to adequately assess and mitigate the potential air quality impacts that the Project may have on the surrounding environment.

3) Diesel Particulate Matter Emissions Inadequately Evaluated

The Exemption fails to mention or evaluate the Project's construction-related or operational toxic air contaminant ("TAC") emissions or conduct a quantified construction or operational health risk analysis ("HRA") whatsoever. This is incorrect for three reasons.

First, by failing to prepare a quantified construction and operational HRA, the Project is inconsistent with CEQA's requirement to make "a reasonable effort to substantively connect a project's air quality impacts to likely health consequences."[11] This poses a problem, as construction of the Project would produce diesel particulate matter ("DPM") emissions through the exhaust stacks of construction equipment over the entire construction duration. Furthermore, operation of the Project is expected to generate 1,666 daily vehicle trips, which would produce additional exhaust emissions and continue to expose nearby, existing sensitive receptors to DPM emissions during Project operation (p. 19). However, the Exemption fails to evaluate the TAC emissions associated with Project construction and operation or indicate the concentrations at which such pollutants would trigger adverse health effects. Thus, without making a

[10] See Attachment A for updated modeling.
[11] "Sierra Club v. County of Fresno." Supreme Court of California, December 2018, a*vailable at:* https://ceqaportal.org/decisions/1907/Sierra%20Club%20v.%20County%20of%20Fresno.pdf.

reasonable effort to connect the Project's TAC emissions to the potential health risks posed to nearby receptors, the Exemption is inconsistent with CEQA's requirement to correlate Project-generated emissions with potential adverse impacts on human health.

Second, the Office of Environmental Health Hazard Assessment ("OEHHA"), the organization responsible for providing guidance on conducting HRAs in California, released its most recent *Risk Assessment Guidelines: Guidance Manual for Preparation of Health Risk Assessments* in February 2015. This guidance document describes the types of projects that warrant the preparation of an HRA. Specifically, OEHHA recommends that all short-term projects lasting at least 2 months assess cancer risks.[12] Furthermore, according to OEHHA:

> "Exposure from projects lasting more than 6 months should be evaluated for the duration of the project. In all cases, for assessing risk to residential receptors, the exposure should be assumed to start in the third trimester to allow for the use of the ASFs (OEHHA, 2009)."[13]

Thus, as the Project's anticipated construction duration exceeds the 2-month and 6-month requirements set forth by OEHHA, construction of the Project meets the threshold warranting a quantified HRA under OEHHA guidance and should be evaluated for the entire construction period. Furthermore, OEHHA recommends that an exposure duration of 30 years should be used to estimate the individual cancer risk at the maximally exposed individual resident ("MEIR").[14] While the Exemption fails to provide the expected lifetime of the proposed Project, we can reasonably assume that the Project would operate for at least 30 years, if not more. Therefore, operation of the Project also exceeds the 2-month and 6-month requirements set forth by OEHHA and should be evaluated for the entire 30-year residential exposure duration, as indicated by OEHHA guidance. These recommendations reflect the most recent state health risk policies, and as such, a full CEQA analysis should be prepared to include an analysis of health risk impacts posed to nearby sensitive receptors from Project-generated DPM emissions.

Third, without conducting a quantified construction or operational HRA for nearby, existing sensitive receptors, the Exemption fails to compare the Project's excess cancer risk to the SCAQMD's specific numeric threshold of 10 in one million.[15] Thus, in accordance with the most relevant guidance, an assessment of the health risk posed to nearby, existing receptors as a result of Project construction and operation should be conducted.

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[12] "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.
[13] "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.
[14] "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. 2-4.
[15] "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.

4) *Screening-Level Analysis Demonstrates Significan Health Risk Impacts*

In order to conduct our screening-level risk assessment we relied upon AERSCREEN, which is a screening level air quality dispersion model.[16] 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").[17, 18] 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 Exemption's CalEEMod output files. Consistent with recommendations set forth by OEHHA, we assumed residential exposure begins during the third trimester stage of life. [19] The Exemption's CalEEMod model indicates that construction activities will generate approximately 399 pounds of DPM over the 827-day construction period.[20] 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:

$$Emission\ Rate\ \left(\frac{grams}{second}\right) = \frac{398.8\ lbs}{827\ days} \times \frac{453.6\ grams}{lbs} \times \frac{1\ day}{24\ hours} \times \frac{1\ hour}{3{,}600\ seconds} = \mathbf{0.00253\ g/s}$$

Using this equation, we estimated a construction emission rate of 0.00253 grams per second ("g/s"). Subtracting the 827-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 27.73 years. The Exemption's operational CalEEMod emissions indicate that operational activities will generate approximately 96 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:

$$Emission\ Rate\ \left(\frac{grams}{second}\right) = \frac{95.9\ lbs}{365\ days} \times \frac{453.6\ grams}{lbs} \times \frac{1\ day}{24\ hours} \times \frac{1\ hour}{3{,}600\ seconds} = \mathbf{0.00138\ g/s}$$

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[16] "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

[17] "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.

[18] "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.

[19] "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.

[20] See Attachment B for health risk calculations.

Using this equation, we estimated an operational emission rate of 0.00138 g/s. Construction and operation were simulated as a 4.78-acre rectangular area source in AERSCREEN, with approximate dimensions of 197- by 98-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 Los Angeles was obtained from U.S. 2020 Census data.[21]

The AERSCREEN model generates maximum reasonable estimates of single-hour DPM concentrations from the Project Site. The United States Environmental Protection Agency ("U.S. EPA") suggests that the annualized average concentration of an air pollutant be estimated by multiplying the single-hour concentration by 10% in screening procedures.[22] According to the Exemption, the nearest sensitive receptors are residential properties located 200 feet, or 60 meters, from the Project site (p. 24). 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 3.815 $\mu g/m^3$ DPM at approximately 100 meters downwind. Multiplying this single-hour concentration by 10%, we get an annualized average concentration of 0.3815 $\mu g/m^3$ for Project construction at the MEIR. For Project operation, the single-hour concentration estimated by AERSCREEN is 2.078 $\mu g/m^3$ DPM at approximately 100 meters downwind. Multiplying this single-hour concentration by 10%, we get an annualized average concentration of 0.2078 $\mu g/m^3$ 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.[23] Specifically, guidance from OEHHA and the California Air Resources Board ("CARB") recommends the use of a standard point estimate approach, including high-point estimate (i.e. 95th percentile) breathing rates and age sensitivity factors ("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:

[21] "Los Angeles." U.S. Census Bureau, 2020, *available at:* https://datacommons.org/place/geoId/0644000.
[22] "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.
[23] "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.

Exposure Assumptions for Residential Individual Cancer Risk						
Age Group	**Breathing Rate** (L/kg-day)[24]	**Age Sensitivity Factor**[25]	**Exposure Duration** (years)	**Fraction of Time at Home**[26]	**Exposure Frequency** (days/year)[27]	**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)
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:

[24] "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.
[25] "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.
[26] "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.
[27] "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.

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

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 827-day construction schedule, the annualized average concentration for construction was used for the entire third trimester of pregnancy (0.25 years), entire infantile stage of life (0 – 2 years), and first 0.02 years of the child stage of life (2 – 16 years). The annualized average concentration for operation was used for the remainder of the 30-year exposure period, which makes up the latter 13.98 years of the child stage of life and the entire adult stage of life (16 – 30 years). The results of our calculations are shown in the table below.

The Maximally Exposed Individual at an Existing Residential Receptor

Age Group	Emissions Source	Duration (years)	Concentration (ug/m3)	Cancer Risk
3rd Trimester	Construction	0.25	0.3815	5.19E-06
Infant (0 - 2)	Construction	2	0.3815	1.25E-04
	Construction	*0.02*	*0.3815*	*1.55E-07*
	Operation	*13.98*	*0.2078*	*7.51E-05*
Child (2 - 16)	Total	14		7.53E-05
Adult (16 - 30)	Operation	14	0.2078	8.35E-06
Lifetime		**30**		**2.14E-04**

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 5.19, 125, 75.3, and 8.35 in one million, respectively. The excess cancer risk over the course of a residential lifetime (30 years) is approximately 214 in one million. The 3rd trimester, infant, 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 Exemption.

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, the Project is ineligible for a Class 32 Categorical Exemption and a full CEQA analysis 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.

Feasible Mitigation Measures Available to Reduce Emissions

Our analysis demonstrates that the Project would result in potentially significant air quality and health risk impacts that should be mitigated further. As such, in an effort to reduce the Project's emissions, we identified several mitigation measures that are applicable to the proposed Project. Therefore, to reduce the Project's emissions, we recommend consideration of SCAG's 2020 *RTP/SCS* PEIR's Air Quality Project Level Mitigation Measures ("PMM-AQ-1"), as described below: [28]

SCAG RTP/SCS 2020-2045
Air Quality Project Level Mitigation Measures – PMM-AQ-1: In accordance with provisions of sections 15091(a)(2) and 15126.4(a)(1)(B) of the *State CEQA Guidelines*, a Lead Agency for a project can and should consider mitigation measures to reduce substantial adverse effects related to violating air quality standards. Such measures may include the following or other comparable measures identified by the Lead Agency:

[28] "4.0 Mitigation Measures." Connect SoCal Program Environmental Impact Report Addendum #1, September 2020, available at: https://scag.ca.gov/sites/main/files/file-attachments/fpeir_connectsocal_addendum_4_mitigationmeasures.pdf?1606004420, p. 4.0-2 – 4.0-10; 4.0-19 – 4.0-23; See also: "Certified Final Connect SoCal Program Environmental Impact Report." Southern California Association of Governments (SCAG), May 2020, *available at:* https://scag.ca.gov/peir.

a) Minimize land disturbance.
b) Suspend grading and earth moving when wind gusts exceed 25 miles per hour unless the soil is wet enough to prevent dust plumes.
c) Cover trucks when hauling dirt.
d) Stabilize the surface of dirt piles if not removed immediately.
e) Limit vehicular paths on unpaved surfaces and stabilize any temporary roads.
f) Minimize unnecessary vehicular and machinery activities.
g) Sweep paved streets at least once per day where there is evidence of dirt that has been carried on to the roadway.
h) Revegetate disturbed land, including vehicular paths created during construction to avoid future off-road vehicular activities.
j) Require contractors to assemble a comprehensive inventory list (i.e., make, model, engine year, horsepower, emission rates) of all heavy-duty off-road (portable and mobile) equipment (50 horsepower and greater) that could be used an aggregate of 40 or more hours for the construction project. Prepare a plan for approval by the applicable air district demonstrating achievement of the applicable percent reduction for a CARB-approved fleet.
k) Ensure that all construction equipment is properly tuned and maintained.
l) Minimize idling time to 5 minutes—saves fuel and reduces emissions.
m) Provide an operational water truck on-site at all times. Use watering trucks to minimize dust; watering should be sufficient to confine dust plumes to the project work areas. Sweep paved streets at least once per day where there is evidence of dirt that has been carried on to the roadway.
n) Utilize existing power sources (e.g., power poles) or clean fuel generators rather than temporary power generators.
o) Develop a traffic plan to minimize traffic flow interference from construction activities. The plan may include advance public notice of routing, use of public transportation, and satellite parking areas with a shuttle service. Schedule operations affecting traffic for off-peak hours. Minimize obstruction of through-traffic lanes. Provide a flag person to guide traffic properly and ensure safety at construction sites.
p) As appropriate require that portable engines and portable engine-driven equipment units used at the project work site, with the exception of on-road and off-road motor vehicles, obtain CARB Portable Equipment Registration with the state or a local district permit. Arrange appropriate consultations with the CARB or the District to determine registration and permitting requirements prior to equipment operation at the site.
q) Require projects within 500 feet of residences, hospitals, or schools to use Tier 4 equipment for all engines above 50 horsepower (hp) unless the individual project can demonstrate that Tier 4 engines would not be required to mitigate emissions below significance thresholds.
r) Projects located within the South Coast Air Basin should consider applying for South Coast AQMD "SOON" funds which provides funds to applicable fleets for the purchase of commercially available low-emission heavy-duty engines to achieve near-term reduction of NOx emissions from in-use off-road diesel vehicles.
s) Projects located within AB 617 communities should review the applicable Community Emissions Reduction Plan (CERP) for additional mitigation that can be applied to individual projects.
t) Where applicable, projects should provide information about air quality related programs to schools, including the Environmental Justice Community Partnerships (EJCP), Clean Air Ranger Education (CARE), and Why Air Quality Matters programs.
u) Projects should work with local cities and counties to install adequate signage that prohibits truck idling in certain locations (e.g., near schools and sensitive receptors).
v) Projects that will introduce sensitive receptors within 500 feet of freeways and other sources should consider installing high efficiency of enhanced filtration units, such as Minimum Efficiency Reporting Value (MERV) 13 or better. Installation of enhanced filtration units can be verified during occupancy inspection prior to the issuance of an occupancy permit.

w) Develop an ongoing monitoring, inspection, and maintenance program for the MERV filters.
aa) Consult the SCAG Environmental Justice Toolbox for potential measures to address impacts to low-income and/or minority communities.
bb) The following criteria related to diesel emissions shall be implemented on by individual project sponsors as appropriate and feasible: - Diesel nonroad vehicles on site for more than 10 total days shall have either (1) engines that meet EPA on road emissions standards or (2) emission control technology verified by EPA or CARB to reduce PM emissions by a minimum of 85% - Diesel generators on site for more than 10 total days shall be equipped with emission control technology verified by EPA or CARB to reduce PM emissions by a minimum of 85%. - Nonroad diesel engines on site shall be Tier 2 or higher. - Diesel nonroad construction equipment on site for more than 10 total days shall have either (1) engines meeting EPA Tier 4 nonroad emissions standards or (2) emission control technology verified by EPA or CARB for use with nonroad engines to reduce PM emissions by a minimum of 85% for engines for 50 hp and greater and by a minimum of 20% for engines less than 50 hp. - Emission control technology shall be operated, maintained, and serviced as recommended by the emission control technology manufacturer. - Diesel vehicles, construction equipment, and generators on site shall be fueled with ultra-low sulfur diesel fuel (ULSD) or a biodiesel blend approved by the original engine manufacturer with sulfur content of 15 ppm or less. - The construction contractor shall maintain a list of all diesel vehicles, construction equipment, and generators to be used on site. The list shall include the following: i. Contractor and subcontractor name and address, plus contact person responsible for the vehicles or equipment. ii. Equipment type, equipment manufacturer, equipment serial number, engine manufacturer, engine model year, engine certification (Tier rating), horsepower, engine serial number, and expected fuel usage and hours of operation. iii. For the emission control technology installed: technology type, serial number, make, model, manufacturer, EPA/CARB verification number/level, and installation date and hour-meter reading on installation date. - The contractor shall establish generator sites and truck-staging zones for vehicles waiting to load or unload material on site. Such zones shall be located where diesel emissions have the least impact on abutters, the general public, and especially sensitive receptors such as hospitals, schools, daycare facilities, elderly housing, and convalescent facilities. - The contractor shall maintain a monthly report that, for each on road diesel vehicle, nonroad construction equipment, or generator onsite, includes: i. Hour-meter readings on arrival on-site, the first and last day of every month, and on off-site date. ii. Any problems with the equipment or emission controls. iii. Certified copies of fuel deliveries for the time period that identify: 1. Source of supply 2. Quantity of fuel 3. Quantity of fuel, including sulfur content (percent by weight)
cc) Project should exceed Title-24 Building Envelope Energy Efficiency Standards (California Building Standards Code). The following measures can be used to increase energy efficiency: - Provide pedestrian network improvements, such as interconnected street network, narrower roadways and shorter block lengths, sidewalks, accessibility to transit and transit shelters, traffic calming measures, parks and public spaces, minimize pedestrian barriers. - Provide traffic calming measures, such as: i. Marked crosswalks ii. Count-down signal timers iii. Curb extensions iv. Speed tables

iv. Raised crosswalks
v. Raised intersections
vi. Median islands
vii. Tight corner radii
viii. Roundabouts or mini-circles
ix. On-street parking
x. Chicanes/chokers

- Create urban non-motorized zones
- Provide bike parking in non-residential and multi-unit residential projects
- Dedicate land for bike trails
- Limit parking supply through:
  i. Elimination (or reduction) of minimum parking requirements
  ii. Creation of maximum parking requirements
  iii. Provision of shared parking
- Require residential area parking permit.
- Provide ride-sharing programs
  i. Designate a certain percentage of parking spacing for ride sharing vehicles
  ii. Designating adequate passenger loading and unloading and waiting areas for ride-sharing vehicles
  iii. Providing a web site or messaging board for coordinating rides
  iv. Permanent transportation management association membership and finding requirement.

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. A full CEQA analysis should be prepared to include all feasible mitigation measures, as well as include updated air quality and health risk analyses to ensure that the necessary mitigation measures are implemented to reduce emissions to below thresholds. The CEQA analysis 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

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

NFC - Future

Los Angeles-South Coast County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Apartments Mid Rise	350.00	Dwelling Unit	2.48	323,941.00	1001
Unenclosed Parking with Elevator	468.00	Space	0.82	193,625.00	0
Parking Lot	38.00	Space	0.34	15,200.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	33
Climate Zone	12			**Operational Year**	2025
Utility Company	Los Angeles Department of Water & Power				
CO2 Intensity (lb/MWhr)	691.98	**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 Exemption's model.

Land Use - See SWAPE comment regarding "Failure to Model Proposed Surface Parking."

Construction Phase - See SWAPE comment regarding "Unsubstantiated Changes to Individual Construction Phase Lengths"

Off-road Equipment - Consistent with the Exemption's model.

Grading - Material import and export consistent with the Exemption's model. See SWAPE comment regarding "Unsubstantiated Reduction to Acres of Grading Value."

Demolition - Consistent with the Exemption's model.

Trips and VMT - Hauling trip lengths consistent with the Exemption's model.

Vehicle Trips - Consistent with the Exemption's model.

Woodstoves - Consistent with the Exemption's model.

Off-road Equipment - Consistent with the Exemption's model.

Off-road Equipment - Consistent with the Exemption's model.

Off-road Equipment - Consistent with the Exemption's model.

Off-road Equipment - Consistent with the Exemption's model.

Construction Off-road Equipment Mitigation - Consistent with the Exemption's model.

Table Name	Column Name	Default Value	New Value
tblConstDustMitigation	CleanPavedRoadPercentReduction	0	46
tblFireplaces	FireplaceDayYear	25.00	0.00
tblFireplaces	FireplaceHourDay	3.00	0.00
tblFireplaces	FireplaceWoodMass	1,019.20	0.00
tblFireplaces	NumberGas	297.50	0.00
tblFireplaces	NumberNoFireplace	35.00	0.00
tblFireplaces	NumberWood	17.50	0.00
tblGrading	MaterialExported	0.00	14,440.00
tblGrading	MaterialImported	0.00	1,160.00
tblLandUse	LandUseSquareFeet	350,000.00	323,941.00
tblLandUse	LandUseSquareFeet	187,200.00	193,625.00
tblLandUse	LotAcreage	9.21	2.48
tblLandUse	LotAcreage	4.21	0.82
tblOffRoadEquipment	HorsePower	80.00	30.00
tblOffRoadEquipment	LoadFactor	0.36	0.36
tblOffRoadEquipment	LoadFactor	0.50	0.50
tblOffRoadEquipment	OffRoadEquipmentType		Rubber Tired Loaders
tblOffRoadEquipment	OffRoadEquipmentType		Bore/Drill Rigs
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00

tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblTripsAndVMT	HaulingTripLength	20.00	40.00
tblTripsAndVMT	HaulingTripLength	20.00	40.00
tblVehicleTrips	ST_TR	4.91	5.32
tblVehicleTrips	SU_TR	4.09	5.32
tblVehicleTrips	WD_TR	5.44	5.32
tblWoodstoves	NumberCatalytic	17.50	0.00
tblWoodstoves	NumberNoncatalytic	17.50	0.00
tblWoodstoves	WoodstoveDayYear	25.00	0.00
tblWoodstoves	WoodstoveWoodMass	999.60	0.00

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2022	0.0193	0.2990	0.1318	7.6000e-004	0.0641	8.1100e-003	0.0722	0.0138	7.5000e-003	0.0213	0.0000	72.3129	72.3129	9.5200e-003	8.0300e-003	74.9429
2023	0.7080	2.5583	3.7071	9.7700e-003	0.5331	0.0978	0.6309	0.1474	0.0923	0.2397	0.0000	888.2634	888.2634	0.0912	0.0439	903.6205
2024	0.6984	0.0155	0.0347	7.0000e-005	4.4700e-003	7.6000e-004	5.2300e-003	1.1900e-003	7.6000e-004	1.9400e-003	0.0000	6.5220	6.5220	2.6000e-004	9.0000e-005	6.5542
Maximum	**0.7080**	**2.5583**	**3.7071**	**9.7700e-003**	**0.5331**	**0.0978**	**0.6309**	**0.1474**	**0.0923**	**0.2397**	**0.0000**	**888.2634**	**888.2634**	**0.0912**	**0.0439**	**903.6205**

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	0.0193	0.2990	0.1318	7.6000e-004	0.0587	8.1100e-003	0.0668	0.0125	7.5000e-003	0.0200	0.0000	72.3128	72.3128	9.5200e-003	8.0300e-003	74.9429
2023	0.7080	2.5583	3.7071	9.7700e-003	0.3350	0.0978	0.4327	0.0988	0.0923	0.1910	0.0000	888.2630	888.2630	0.0912	0.0439	903.6201
2024	0.6984	0.0155	0.0347	7.0000e-005	2.6900e-003	7.6000e-004	3.4500e-003	7.5000e-004	7.6000e-004	1.5100e-003	0.0000	6.5220	6.5220	2.6000e-004	9.0000e-005	6.5542
Maximum	**0.7080**	**2.5583**	**3.7071**	**9.7700e-003**	**0.3350**	**0.0978**	**0.4327**	**0.0988**	**0.0923**	**0.1910**	**0.0000**	**888.2630**	**888.2630**	**0.0912**	**0.0439**	**903.6201**

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**	**34.12**	**0.00**	**28.98**	**31.03**	**0.00**	**19.16**	**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	**12-1-2022**	**2-28-2023**	0.9993	0.9993
2	**3-1-2023**	**5-31-2023**	0.7367	0.7367
3	**6-1-2023**	**8-31-2023**	0.7336	0.7336
4	**9-1-2023**	**11-30-2023**	0.7147	0.7147
5	**12-1-2023**	**2-29-2024**	1.1553	1.1553
		Highest	1.1553	1.1553

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	1.3972	0.0416	3.6125	1.9000e-004		0.0200	0.0200		0.0200	0.0200	0.0000	5.9085	5.9085	5.6800e-003	0.0000	6.0505
Energy	0.0203	0.1735	0.0738	1.1100e-003		0.0140	0.0140		0.0140	0.0140	0.0000	743.4970	743.4970	0.0297	6.8200e-003	746.2725
Mobile	0.9586	1.0801	9.8939	0.0219	2.3907	0.0159	2.4066	0.6378	0.0148	0.6526	0.0000	2,023.0073	2,023.0073	0.1388	0.0875	2,052.5468
Waste						0.0000	0.0000		0.0000	0.0000	32.6816	0.0000	32.6816	1.9314	0.0000	80.9671
Water						0.0000	0.0000		0.0000	0.0000	7.2346	143.3323	150.5669	0.7499	0.0184	174.7898
Total	**2.3761**	**1.2952**	**13.5801**	**0.0232**	**2.3907**	**0.0500**	**2.4407**	**0.6378**	**0.0489**	**0.6867**	**39.9162**	**2,915.7450**	**2,955.6612**	**2.8556**	**0.1127**	**3,060.6267**

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	1.3972	0.0416	3.6125	1.9000e-004		0.0200	0.0200		0.0200	0.0200	0.0000	5.9085	5.9085	5.6800e-003	0.0000	6.0505
Energy	0.0203	0.1735	0.0738	1.1100e-003		0.0140	0.0140		0.0140	0.0140	0.0000	743.4970	743.4970	0.0297	6.8200e-003	746.2725
Mobile	0.9586	1.0801	9.8939	0.0219	2.3907	0.0159	2.4066	0.6378	0.0148	0.6526	0.0000	2,023.0073	2,023.0073	0.1388	0.0875	2,052.5468
Waste						0.0000	0.0000		0.0000	0.0000	32.6816	0.0000	32.6816	1.9314	0.0000	80.9671
Water						0.0000	0.0000		0.0000	0.0000	7.2346	143.3323	150.5669	0.7499	0.0184	174.7898
Total	**2.3761**	**1.2952**	**13.5801**	**0.0232**	**2.3907**	**0.0500**	**2.4407**	**0.6378**	**0.0489**	**0.6867**	**39.9162**	**2,915.7450**	**2,955.6612**	**2.8556**	**0.1127**	**3,060.6267**

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

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	12/1/2022	12/28/2022	5	20	
2	Grading	Grading	12/29/2022	1/9/2023	5	8	
3	Building Construction	Building Construction	1/10/2023	11/27/2023	5	230	

4	Paving	Paving	11/28/2023	12/21/2023	5	18	
5	Architectural Coating	Architectural Coating	12/22/2023	1/16/2024	5	18	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 8

Acres of Paving: 1.16

Residential Indoor: 655,981; Residential Outdoor: 218,660; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 12,530 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Architectural Coating	Air Compressors	2	6.00	78	0.48
Paving	Cement and Mortar Mixers	0	6.00	9	0.56
Demolition	Concrete/Industrial Saws	0	8.00	81	0.73
Building Construction	Cranes	1	7.00	231	0.29
Demolition	Excavators	1	8.00	158	0.38
Grading	Excavators	1	8.00	158	0.38
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Grading	Graders	1	8.00	187	0.41
Paving	Pavers	1	8.00	130	0.42
Paving	Paving Equipment	1	6.00	132	0.36
Paving	Rollers	2	6.00	30	0.38
Demolition	Rubber Tired Dozers	1	8.00	247	0.40
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Demolition	Rubber Tired Loaders	1	8.00	203	0.36
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Grading	Tractors/Loaders/Backhoes	3	8.00	97	0.37
Paving	Tractors/Loaders/Backhoes	1	8.00	97	0.37

Grading	Bore/Drill Rigs	1	8.00	221	0.50
Building Construction	Welders	2	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
Demolition	3	8.00	0.00	347.00	14.70	6.90	40.00	LD_Mix	HDT_Mix	HHDT
Grading	7	18.00	0.00	1,950.00	14.70	6.90	40.00	LD_Mix	HDT_Mix	HHDT
Building Construction	10	340.00	72.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Paving	5	13.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	2	68.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Water Exposed Area

Clean Paved Roads

3.2 Demolition - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0376	0.0000	0.0376	5.6900e-003	0.0000	5.6900e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0133	0.1361	0.0838	2.0000e-004		6.0500e-003	6.0500e-003		5.5700e-003	5.5700e-003	0.0000	17.5608	17.5608	5.6800e-003	0.0000	17.7028
Total	**0.0133**	**0.1361**	**0.0838**	**2.0000e-004**	**0.0376**	**6.0500e-003**	**0.0436**	**5.6900e-003**	**5.5700e-003**	**0.0113**	**0.0000**	**17.5608**	**17.5608**	**5.6800e-003**	**0.0000**	**17.7028**

3.2 Demolition - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	1.4200e-003	0.0580	0.0112	2.1000e-004	5.9700e-003	4.3000e-004	6.4000e-003	1.6400e-003	4.1000e-004	2.0500e-003	0.0000	20.9699	20.9699	1.1300e-003	3.3300e-003	21.9897
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.7000e-004	2.3000e-004	2.9700e-003	1.0000e-005	8.8000e-004	1.0000e-005	8.8000e-004	2.3000e-004	1.0000e-005	2.4000e-004	0.0000	0.7210	0.7210	2.0000e-005	2.0000e-005	0.7274
Total	**1.6900e-003**	**0.0582**	**0.0142**	**2.2000e-004**	**6.8500e-003**	**4.4000e-004**	**7.2800e-003**	**1.8700e-003**	**4.2000e-004**	**2.2900e-003**	**0.0000**	**21.6909**	**21.6909**	**1.1500e-003**	**3.3500e-003**	**22.7170**

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					0.0376	0.0000	0.0376	5.6900e-003	0.0000	5.6900e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0133	0.1361	0.0838	2.0000e-004		6.0500e-003	6.0500e-003		5.5700e-003	5.5700e-003	0.0000	17.5608	17.5608	5.6800e-003	0.0000	17.7027
Total	**0.0133**	**0.1361**	**0.0838**	**2.0000e-004**	**0.0376**	**6.0500e-003**	**0.0436**	**5.6900e-003**	**5.5700e-003**	**0.0113**	**0.0000**	**17.5608**	**17.5608**	**5.6800e-003**	**0.0000**	**17.7027**

3.2 Demolition - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	1.4200e-003	0.0580	0.0112	2.1000e-004	3.9000e-003	4.3000e-004	4.3300e-003	1.1300e-003	4.1000e-004	1.5400e-003	0.0000	20.9699	20.9699	1.1300e-003	3.3300e-003	21.9897
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.7000e-004	2.3000e-004	2.9700e-003	1.0000e-005	5.3000e-004	1.0000e-005	5.3000e-004	1.5000e-004	1.0000e-005	1.5000e-004	0.0000	0.7210	0.7210	2.0000e-005	2.0000e-005	0.7274
Total	**1.6900e-003**	**0.0582**	**0.0142**	**2.2000e-004**	**4.4300e-003**	**4.4000e-004**	**4.8600e-003**	**1.2800e-003**	**4.2000e-004**	**1.6900e-003**	**0.0000**	**21.6909**	**21.6909**	**1.1500e-003**	**3.3500e-003**	**22.7170**

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					0.0112	0.0000	0.0112	3.9000e-003	0.0000	3.9000e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.1700e-003	0.0231	0.0173	4.0000e-005		1.0100e-003	1.0100e-003		9.3000e-004	9.3000e-004	0.0000	3.4384	3.4384	1.1100e-003	0.0000	3.4662
Total	**2.1700e-003**	**0.0231**	**0.0173**	**4.0000e-005**	**0.0112**	**1.0100e-003**	**0.0122**	**3.9000e-003**	**9.3000e-004**	**4.8300e-003**	**0.0000**	**3.4384**	**3.4384**	**1.1100e-003**	**0.0000**	**3.4662**

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	2.0000e-003	0.0815	0.0158	3.0000e-004	8.3800e-003	6.1000e-004	8.9900e-003	2.3000e-003	5.8000e-004	2.8800e-003	0.0000	29.4606	29.4606	1.5800e-003	4.6700e-003	30.8932
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	6.0000e-005	5.0000e-005	6.7000e-004	0.0000	2.0000e-004	0.0000	2.0000e-004	5.0000e-005	0.0000	5.0000e-005	0.0000	0.1622	0.1622	0.0000	0.0000	0.1637
Total	**2.0600e-003**	**0.0816**	**0.0165**	**3.0000e-004**	**8.5800e-003**	**6.1000e-004**	**9.1900e-003**	**2.3500e-003**	**5.8000e-004**	**2.9300e-003**	**0.0000**	**29.6228**	**29.6228**	**1.5800e-003**	**4.6700e-003**	**31.0569**

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					0.0112	0.0000	0.0112	3.9000e-003	0.0000	3.9000e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.1700e-003	0.0231	0.0173	4.0000e-005		1.0100e-003	1.0100e-003		9.3000e-004	9.3000e-004	0.0000	3.4384	3.4384	1.1100e-003	0.0000	3.4662
Total	**2.1700e-003**	**0.0231**	**0.0173**	**4.0000e-005**	**0.0112**	**1.0100e-003**	**0.0122**	**3.9000e-003**	**9.3000e-004**	**4.8300e-003**	**0.0000**	**3.4384**	**3.4384**	**1.1100e-003**	**0.0000**	**3.4662**

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	2.0000e-003	0.0815	0.0158	3.0000e-004	5.4800e-003	6.1000e-004	6.0900e-003	1.5900e-003	5.8000e-004	2.1700e-003	0.0000	29.4606	29.4606	1.5800e-003	4.6700e-003	30.8932
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	6.0000e-005	5.0000e-005	6.7000e-004	0.0000	1.2000e-004	0.0000	1.2000e-004	3.0000e-005	0.0000	3.0000e-005	0.0000	0.1622	0.1622	0.0000	0.0000	0.1637
Total	**2.0600e-003**	**0.0816**	**0.0165**	**3.0000e-004**	**5.6000e-003**	**6.1000e-004**	**6.2100e-003**	**1.6200e-003**	**5.8000e-004**	**2.2000e-003**	**0.0000**	**29.6228**	**29.6228**	**1.5800e-003**	**4.6700e-003**	**31.0569**

3.3 Grading - 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					
Fugitive Dust					0.0232	0.0000	0.0232	0.0105	0.0000	0.0105	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	5.7800e-003	0.0600	0.0504	1.2000e-004		2.5200e-003	2.5200e-003		2.3200e-003	2.3200e-003	0.0000	10.3220	10.3220	3.3400e-003	0.0000	10.4054
Total	**5.7800e-003**	**0.0600**	**0.0504**	**1.2000e-004**	**0.0232**	**2.5200e-003**	**0.0257**	**0.0105**	**2.3200e-003**	**0.0128**	**0.0000**	**10.3220**	**10.3220**	**3.3400e-003**	**0.0000**	**10.4054**

3.3 Grading - 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	2.3400e-003	0.1875	0.0402	8.4000e-004	0.0252	1.2000e-003	0.0263	6.9100e-003	1.1500e-003	8.0500e-003	0.0000	83.4322	83.4322	4.6400e-003	0.0133	87.4971
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	1.4000e-004	1.8400e-003	1.0000e-005	5.9000e-004	0.0000	6.0000e-004	1.6000e-004	0.0000	1.6000e-004	0.0000	0.4710	0.4710	1.0000e-005	1.0000e-005	0.4750
Total	**2.5100e-003**	**0.1877**	**0.0420**	**8.5000e-004**	**0.0257**	**1.2000e-003**	**0.0269**	**7.0700e-003**	**1.1500e-003**	**8.2100e-003**	**0.0000**	**83.9033**	**83.9033**	**4.6500e-003**	**0.0133**	**87.9721**

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					0.0232	0.0000	0.0232	0.0105	0.0000	0.0105	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	5.7800e-003	0.0600	0.0504	1.2000e-004		2.5200e-003	2.5200e-003		2.3200e-003	2.3200e-003	0.0000	10.3220	10.3220	3.3400e-003	0.0000	10.4054
Total	**5.7800e-003**	**0.0600**	**0.0504**	**1.2000e-004**	**0.0232**	**2.5200e-003**	**0.0257**	**0.0105**	**2.3200e-003**	**0.0128**	**0.0000**	**10.3220**	**10.3220**	**3.3400e-003**	**0.0000**	**10.4054**

3.3 Grading - 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	2.3400e-003	0.1875	0.0402	8.4000e-004	0.0165	1.2000e-003	0.0177	4.7700e-003	1.1500e-003	5.9200e-003	0.0000	83.4322	83.4322	4.6400e-003	0.0133	87.4971
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	1.4000e-004	1.8400e-003	1.0000e-005	3.6000e-004	0.0000	3.6000e-004	1.0000e-004	0.0000	1.0000e-004	0.0000	0.4710	0.4710	1.0000e-005	1.0000e-005	0.4750
Total	**2.5100e-003**	**0.1877**	**0.0420**	**8.5000e-004**	**0.0168**	**1.2000e-003**	**0.0180**	**4.8700e-003**	**1.1500e-003**	**6.0200e-003**	**0.0000**	**83.9033**	**83.9033**	**4.6500e-003**	**0.0133**	**87.9721**

3.4 Building Construction - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.2101	1.8176	2.0610	3.3900e-003		0.0868	0.0868		0.0821	0.0821	0.0000	288.2208	288.2208	0.0658	0.0000	289.8652
Total	**0.2101**	**1.8176**	**2.0610**	**3.3900e-003**		**0.0868**	**0.0868**		**0.0821**	**0.0821**	**0.0000**	**288.2208**	**288.2208**	**0.0658**	**0.0000**	**289.8652**

3.4 Building Construction - 2023

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	9.3500e-003	0.3337	0.1249	1.5400e-003	0.0522	1.6000e-003	0.0538	0.0151	1.5300e-003	0.0166	0.0000	150.5488	150.5488	5.0300e-003	0.0217	157.1311
Worker	0.1241	0.0985	1.3322	3.7200e-003	0.4285	2.6300e-003	0.4311	0.1138	2.4200e-003	0.1162	0.0000	341.0473	341.0473	9.0700e-003	8.8800e-003	343.9196
Total	**0.1334**	**0.4322**	**1.4571**	**5.2600e-003**	**0.4806**	**4.2300e-003**	**0.4849**	**0.1289**	**3.9500e-003**	**0.1328**	**0.0000**	**491.5961**	**491.5961**	**0.0141**	**0.0306**	**501.0508**

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	0.2101	1.8176	2.0610	3.3900e-003		0.0868	0.0868		0.0821	0.0821	0.0000	288.2205	288.2205	0.0658	0.0000	289.8649
Total	**0.2101**	**1.8176**	**2.0610**	**3.3900e-003**		**0.0868**	**0.0868**		**0.0821**	**0.0821**	**0.0000**	**288.2205**	**288.2205**	**0.0658**	**0.0000**	**289.8649**

3.4 Building Construction - 2023

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	9.3500e-003	0.3337	0.1249	1.5400e-003	0.0352	1.6000e-003	0.0368	0.0109	1.5300e-003	0.0124	0.0000	150.5488	150.5488	5.0300e-003	0.0217	157.1311
Worker	0.1241	0.0985	1.3322	3.7200e-003	0.2576	2.6300e-003	0.2603	0.0719	2.4200e-003	0.0743	0.0000	341.0473	341.0473	9.0700e-003	8.8800e-003	343.9196
Total	**0.1334**	**0.4322**	**1.4571**	**5.2600e-003**	**0.2928**	**4.2300e-003**	**0.2971**	**0.0828**	**3.9500e-003**	**0.0867**	**0.0000**	**491.5961**	**491.5961**	**0.0141**	**0.0306**	**501.0508**

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	6.0400e-003	0.0522	0.0748	1.1000e-004		2.5800e-003	2.5800e-003		2.3700e-003	2.3700e-003	0.0000	9.8894	9.8894	3.2000e-003	0.0000	9.9693
Paving	4.5000e-004					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**6.4900e-003**	**0.0522**	**0.0748**	**1.1000e-004**		**2.5800e-003**	**2.5800e-003**		**2.3700e-003**	**2.3700e-003**	**0.0000**	**9.8894**	**9.8894**	**3.2000e-003**	**0.0000**	**9.9693**

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	3.7000e-004	2.9000e-004	3.9900e-003	1.0000e-005	1.2800e-003	1.0000e-005	1.2900e-003	3.4000e-004	1.0000e-005	3.5000e-004	0.0000	1.0205	1.0205	3.0000e-005	3.0000e-005	1.0291
Total	**3.7000e-004**	**2.9000e-004**	**3.9900e-003**	**1.0000e-005**	**1.2800e-003**	**1.0000e-005**	**1.2900e-003**	**3.4000e-004**	**1.0000e-005**	**3.5000e-004**	**0.0000**	**1.0205**	**1.0205**	**3.0000e-005**	**3.0000e-005**	**1.0291**

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	6.0400e-003	0.0522	0.0748	1.1000e-004		2.5800e-003	2.5800e-003		2.3700e-003	2.3700e-003	0.0000	9.8894	9.8894	3.2000e-003	0.0000	9.9693
Paving	4.5000e-004					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**6.4900e-003**	**0.0522**	**0.0748**	**1.1000e-004**		**2.5800e-003**	**2.5800e-003**		**2.3700e-003**	**2.3700e-003**	**0.0000**	**9.8894**	**9.8894**	**3.2000e-003**	**0.0000**	**9.9693**

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	3.7000e-004	2.9000e-004	3.9900e-003	1.0000e-005	7.7000e-004	1.0000e-005	7.8000e-004	2.2000e-004	1.0000e-005	2.2000e-004	0.0000	1.0205	1.0205	3.0000e-005	3.0000e-005	1.0291
Total	**3.7000e-004**	**2.9000e-004**	**3.9900e-003**	**1.0000e-005**	**7.7000e-004**	**1.0000e-005**	**7.8000e-004**	**2.2000e-004**	**1.0000e-005**	**2.2000e-004**	**0.0000**	**1.0205**	**1.0205**	**3.0000e-005**	**3.0000e-005**	**1.0291**

3.6 Architectural Coating - 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	0.3475					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.1500e-003	7.8200e-003	0.0109	2.0000e-005		4.2000e-004	4.2000e-004		4.2000e-004	4.2000e-004	0.0000	1.5320	1.5320	9.0000e-005	0.0000	1.5342
Total	**0.3487**	**7.8200e-003**	**0.0109**	**2.0000e-005**		**4.2000e-004**	**4.2000e-004**		**4.2000e-004**	**4.2000e-004**	**0.0000**	**1.5320**	**1.5320**	**9.0000e-005**	**0.0000**	**1.5342**

3.6 Architectural Coating - 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	6.5000e-004	5.1000e-004	6.9500e-003	2.0000e-005	2.2400e-003	1.0000e-005	2.2500e-003	5.9000e-004	1.0000e-005	6.1000e-004	0.0000	1.7794	1.7794	5.0000e-005	5.0000e-005	1.7944
Total	**6.5000e-004**	**5.1000e-004**	**6.9500e-003**	**2.0000e-005**	**2.2400e-003**	**1.0000e-005**	**2.2500e-003**	**5.9000e-004**	**1.0000e-005**	**6.1000e-004**	**0.0000**	**1.7794**	**1.7794**	**5.0000e-005**	**5.0000e-005**	**1.7944**

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	0.3475					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.1500e-003	7.8200e-003	0.0109	2.0000e-005		4.2000e-004	4.2000e-004		4.2000e-004	4.2000e-004	0.0000	1.5320	1.5320	9.0000e-005	0.0000	1.5342
Total	**0.3487**	**7.8200e-003**	**0.0109**	**2.0000e-005**		**4.2000e-004**	**4.2000e-004**		**4.2000e-004**	**4.2000e-004**	**0.0000**	**1.5320**	**1.5320**	**9.0000e-005**	**0.0000**	**1.5342**

3.6 Architectural Coating - 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	6.5000e-004	5.1000e-004	6.9500e-003	2.0000e-005	1.3400e-003	1.0000e-005	1.3600e-003	3.7000e-004	1.0000e-005	3.9000e-004	0.0000	1.7794	1.7794	5.0000e-005	5.0000e-005	1.7944
Total	**6.5000e-004**	**5.1000e-004**	**6.9500e-003**	**2.0000e-005**	**1.3400e-003**	**1.0000e-005**	**1.3600e-003**	**3.7000e-004**	**1.0000e-005**	**3.9000e-004**	**0.0000**	**1.7794**	**1.7794**	**5.0000e-005**	**5.0000e-005**	**1.7944**

3.6 Architectural Coating - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.6950					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.1700e-003	0.0146	0.0217	4.0000e-005		7.3000e-004	7.3000e-004		7.3000e-004	7.3000e-004	0.0000	3.0639	3.0639	1.7000e-004	0.0000	3.0682
Total	**0.6972**	**0.0146**	**0.0217**	**4.0000e-005**		**7.3000e-004**	**7.3000e-004**		**7.3000e-004**	**7.3000e-004**	**0.0000**	**3.0639**	**3.0639**	**1.7000e-004**	**0.0000**	**3.0682**

3.6 Architectural Coating - 2024

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.2100e-003	9.2000e-004	0.0129	4.0000e-005	4.4700e-003	3.0000e-005	4.5000e-003	1.1900e-003	2.0000e-005	1.2100e-003	0.0000	3.4581	3.4581	9.0000e-005	9.0000e-005	3.4859
Total	**1.2100e-003**	**9.2000e-004**	**0.0129**	**4.0000e-005**	**4.4700e-003**	**3.0000e-005**	**4.5000e-003**	**1.1900e-003**	**2.0000e-005**	**1.2100e-003**	**0.0000**	**3.4581**	**3.4581**	**9.0000e-005**	**9.0000e-005**	**3.4859**

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	0.6950					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.1700e-003	0.0146	0.0217	4.0000e-005		7.3000e-004	7.3000e-004		7.3000e-004	7.3000e-004	0.0000	3.0639	3.0639	1.7000e-004	0.0000	3.0682
Total	**0.6972**	**0.0146**	**0.0217**	**4.0000e-005**		**7.3000e-004**	**7.3000e-004**		**7.3000e-004**	**7.3000e-004**	**0.0000**	**3.0639**	**3.0639**	**1.7000e-004**	**0.0000**	**3.0682**

3.6 Architectural Coating - 2024

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.2100e-003	9.2000e-004	0.0129	4.0000e-005	2.6900e-003	3.0000e-005	2.7100e-003	7.5000e-004	2.0000e-005	7.7000e-004	0.0000	3.4581	3.4581	9.0000e-005	9.0000e-005	3.4859
Total	**1.2100e-003**	**9.2000e-004**	**0.0129**	**4.0000e-005**	**2.6900e-003**	**3.0000e-005**	**2.7100e-003**	**7.5000e-004**	**2.0000e-005**	**7.7000e-004**	**0.0000**	**3.4581**	**3.4581**	**9.0000e-005**	**9.0000e-005**	**3.4859**

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	0.9586	1.0801	9.8939	0.0219	2.3907	0.0159	2.4066	0.6378	0.0148	0.6526	0.0000	2,023.007 3	2,023.007 3	0.1388	0.0875	2,052.546 8
Unmitigated	0.9586	1.0801	9.8939	0.0219	2.3907	0.0159	2.4066	0.6378	0.0148	0.6526	0.0000	2,023.007 3	2,023.007 3	0.1388	0.0875	2,052.546 8

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Apartments Mid Rise	1,862.00	1,862.00	1862.00	6,362,737	6,362,737
Parking Lot	0.00	0.00	0.00		
Unenclosed Parking with Elevator	0.00	0.00	0.00		
Total	1,862.00	1,862.00	1,862.00	6,362,737	6,362,737

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
Apartments Mid Rise	14.70	5.90	8.70	40.20	19.20	40.60	86	11	3
Parking Lot	16.60	8.40	6.90	0.00	0.00	0.00	0	0	0
Unenclosed Parking with Elevator	16.60	8.40	6.90	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Apartments Mid Rise	0.540171	0.064547	0.189075	0.126673	0.023412	0.006384	0.010926	0.008089	0.000929	0.000597	0.025155	0.000706	0.003335
Parking Lot	0.540171	0.064547	0.189075	0.126673	0.023412	0.006384	0.010926	0.008089	0.000929	0.000597	0.025155	0.000706	0.003335

Unenclosed Parking with Elevator	0.540171	0.064547	0.189075	0.126673	0.023412	0.006384	0.010926	0.008089	0.000929	0.000597	0.025155	0.000706	0.003335

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	542.5773	542.5773	0.0259	3.1400e-003	544.1588
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	542.5773	542.5773	0.0259	3.1400e-003	544.1588
NaturalGas Mitigated	0.0203	0.1735	0.0738	1.1100e-003		0.0140	0.0140		0.0140	0.0140	0.0000	200.9197	200.9197	3.8500e-003	3.6800e-003	202.1137
NaturalGas Unmitigated	0.0203	0.1735	0.0738	1.1100e-003		0.0140	0.0140		0.0140	0.0140	0.0000	200.9197	200.9197	3.8500e-003	3.6800e-003	202.1137

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					
Apartments Mid Rise	3.76509e+006	0.0203	0.1735	0.0738	1.1100e-003		0.0140	0.0140		0.0140	0.0140	0.0000	200.9197	200.9197	3.8500e-003	3.6800e-003	202.1137
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
Unenclosed Parking with Elevator	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
Total		**0.0203**	**0.1735**	**0.0738**	**1.1100e-003**		**0.0140**	**0.0140**		**0.0140**	**0.0140**	**0.0000**	**200.9197**	**200.9197**	**3.8500e-003**	**3.6800e-003**	**202.1137**

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					
Apartments Mid Rise	3.76509e+006	0.0203	0.1735	0.0738	1.1100e-003		0.0140	0.0140		0.0140	0.0140	0.0000	200.9197	200.9197	3.8500e-003	3.6800e-003	202.1137
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
Unenclosed Parking with Elevator	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
Total		**0.0203**	**0.1735**	**0.0738**	**1.1100e-003**		**0.0140**	**0.0140**		**0.0140**	**0.0140**	**0.0000**	**200.9197**	**200.9197**	**3.8500e-003**	**3.6800e-003**	**202.1137**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Apartments Mid Rise	1.34768e +006	423.0051	0.0202	2.4500e-003	424.2381
Parking Lot	5320	1.6698	8.0000e-005	1.0000e-005	1.6747
Unenclosed Parking with Elevator	375633	117.9024	5.6200e-003	6.8000e-004	118.2460
Total		**542.5773**	**0.0259**	**3.1400e-003**	**544.1588**

5.3 Energy by Land Use - Electricity

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Apartments Mid Rise	1.34768e +006	423.0051	0.0202	2.4500e-003	424.2381
Parking Lot	5320	1.6698	8.0000e-005	1.0000e-005	1.6747
Unenclosed Parking with Elevator	375633	117.9024	5.6200e-003	6.8000e-004	118.2460
Total		**542.5773**	**0.0259**	**3.1400e-003**	**544.1588**

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	1.3972	0.0416	3.6125	1.9000e-004		0.0200	0.0200		0.0200	0.0200	0.0000	5.9085	5.9085	5.6800e-003	0.0000	6.0505
Unmitigated	1.3972	0.0416	3.6125	1.9000e-004		0.0200	0.0200		0.0200	0.0200	0.0000	5.9085	5.9085	5.6800e-003	0.0000	6.0505

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	0.1043					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	1.1841					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.1089	0.0416	3.6125	1.9000e-004		0.0200	0.0200		0.0200	0.0200	0.0000	5.9085	5.9085	5.6800e-003	0.0000	6.0505
Total	**1.3972**	**0.0416**	**3.6125**	**1.9000e-004**		**0.0200**	**0.0200**		**0.0200**	**0.0200**	**0.0000**	**5.9085**	**5.9085**	**5.6800e-003**	**0.0000**	**6.0505**

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	0.1043					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	1.1841					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.1089	0.0416	3.6125	1.9000e-004		0.0200	0.0200		0.0200	0.0200	0.0000	5.9085	5.9085	5.6800e-003	0.0000	6.0505
Total	**1.3972**	**0.0416**	**3.6125**	**1.9000e-004**		**0.0200**	**0.0200**		**0.0200**	**0.0200**	**0.0000**	**5.9085**	**5.9085**	**5.6800e-003**	**0.0000**	**6.0505**

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	150.5669	0.7499	0.0184	174.7898
Unmitigated	150.5669	0.7499	0.0184	174.7898

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Apartments Mid Rise	22.8039 / 14.3764	150.5669	0.7499	0.0184	174.7898
Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000
Unenclosed Parking with Elevator	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**150.5669**	**0.7499**	**0.0184**	**174.7898**

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Apartments Mid Rise	22.8039 / 14.3764	150.5669	0.7499	0.0184	174.7898
Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000
Unenclosed Parking with Elevator	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**150.5669**	**0.7499**	**0.0184**	**174.7898**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	32.6816	1.9314	0.0000	80.9671
Unmitigated	32.6816	1.9314	0.0000	80.9671

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Apartments Mid Rise	161	32.6816	1.9314	0.0000	80.9671
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Unenclosed Parking with Elevator	0	0.0000	0.0000	0.0000	0.0000
Total		**32.6816**	**1.9314**	**0.0000**	**80.9671**

8.2 Waste by Land Use

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Apartments Mid Rise	161	32.6816	1.9314	0.0000	80.9671
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Unenclosed Parking with Elevator	0	0.0000	0.0000	0.0000	0.0000
Total		**32.6816**	**1.9314**	**0.0000**	**80.9671**

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

NFC - Future

Los Angeles-South Coast County, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Apartments Mid Rise	350.00	Dwelling Unit	2.48	323,941.00	1001
Unenclosed Parking with Elevator	468.00	Space	0.82	193,625.00	0
Parking Lot	38.00	Space	0.34	15,200.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	33
Climate Zone	12			**Operational Year**	2025
Utility Company	Los Angeles Department of Water & Power				
CO2 Intensity (lb/MWhr)	691.98	**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 Exemption's model.

Land Use - See SWAPE comment regarding "Failure to Model Proposed Surface Parking."

Construction Phase - See SWAPE comment regarding "Unsubstantiated Changes to Individual Construction Phase Lengths"

Off-road Equipment - Consistent with the Exemption's model.

Grading - Material import and export consistent with the Exemption's model. See SWAPE comment regarding "Unsubstantiated Reduction to Acres of Grading Value."

Demolition - Consistent with the Exemption's model.

Trips and VMT - Hauling trip lengths consistent with the Exemption's model.

Vehicle Trips - Consistent with the Exemption's model.

Woodstoves - Consistent with the Exemption's model.

Off-road Equipment - Consistent with the Exemption's model.

Off-road Equipment - Consistent with the Exemption's model.

Off-road Equipment - Consistent with the Exemption's model.

Off-road Equipment - Consistent with the Exemption's model.

Construction Off-road Equipment Mitigation - Consistent with the Exemption's model.

Table Name	Column Name	Default Value	New Value
tblConstDustMitigation	CleanPavedRoadPercentReduction	0	46
tblFireplaces	FireplaceDayYear	25.00	0.00
tblFireplaces	FireplaceHourDay	3.00	0.00
tblFireplaces	FireplaceWoodMass	1,019.20	0.00
tblFireplaces	NumberGas	297.50	0.00
tblFireplaces	NumberNoFireplace	35.00	0.00
tblFireplaces	NumberWood	17.50	0.00
tblGrading	MaterialExported	0.00	14,440.00
tblGrading	MaterialImported	0.00	1,160.00
tblLandUse	LandUseSquareFeet	350,000.00	323,941.00
tblLandUse	LandUseSquareFeet	187,200.00	193,625.00
tblLandUse	LotAcreage	9.21	2.48
tblLandUse	LotAcreage	4.21	0.82
tblOffRoadEquipment	HorsePower	80.00	30.00
tblOffRoadEquipment	LoadFactor	0.36	0.36
tblOffRoadEquipment	LoadFactor	0.50	0.50
tblOffRoadEquipment	OffRoadEquipmentType		Rubber Tired Loaders
tblOffRoadEquipment	OffRoadEquipmentType		Bore/Drill Rigs
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00

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

tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblTripsAndVMT	HaulingTripLength	20.00	40.00
tblTripsAndVMT	HaulingTripLength	20.00	40.00
tblVehicleTrips	ST_TR	4.91	5.32
tblVehicleTrips	SU_TR	4.09	5.32
tblVehicleTrips	WD_TR	5.44	5.32
tblWoodstoves	NumberCatalytic	17.50	0.00
tblWoodstoves	NumberNoncatalytic	17.50	0.00
tblWoodstoves	WoodstoveDayYear	25.00	0.00
tblWoodstoves	WoodstoveWoodMass	999.60	0.00

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2022	4.2441	100.4341	33.7646	0.3373	16.0322	1.6202	17.6523	5.8491	1.5128	7.3619	0.0000	36,448.9015	36,448.9015	2.9742	5.1572	38,060.0991
2023	116.4374	79.2522	31.2801	0.3197	16.0324	1.2413	17.2737	5.8492	1.1566	7.0058	0.0000	34,621.8665	34,621.8665	2.9382	4.8717	36,147.0875
2024	116.4008	2.5730	5.9039	0.0125	0.7601	0.1262	0.8863	0.2016	0.1259	0.3274	0.0000	1,223.6726	1,223.6726	0.0472	0.0146	1,229.2021
Maximum	**116.4374**	**100.4341**	**33.7646**	**0.3373**	**16.0324**	**1.6202**	**17.6523**	**5.8492**	**1.5128**	**7.3619**	**0.0000**	**36,448.9015**	**36,448.9015**	**2.9742**	**5.1572**	**38,060.0991**

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	4.2441	100.4341	33.7646	0.3373	12.9869	1.6202	14.6070	5.1016	1.5128	6.6144	0.0000	36,448.9015	36,448.9015	2.9742	5.1572	38,060.0991
2023	116.4374	79.2522	31.2801	0.3197	12.9871	1.2413	14.2284	5.1017	1.1566	6.2583	0.0000	34,621.8665	34,621.8665	2.9382	4.8717	36,147.0875
2024	116.4008	2.5730	5.9039	0.0125	0.4561	0.1262	0.5823	0.1270	0.1259	0.2528	0.0000	1,223.6726	1,223.6726	0.0472	0.0146	1,229.2021
Maximum	**116.4374**	**100.4341**	**33.7646**	**0.3373**	**12.9871**	**1.6202**	**14.6070**	**5.1017**	**1.5128**	**6.6144**	**0.0000**	**36,448.9015**	**36,448.9015**	**2.9742**	**5.1572**	**38,060.0991**

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	19.48	0.00	17.86	13.19	0.00	10.68	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	7.9301	0.3328	28.8996	1.5300e-003		0.1603	0.1603		0.1603	0.1603	0.0000	52.1040	52.1040	0.0501	0.0000	53.3560
Energy	0.1112	0.9506	0.4045	6.0700e-003		0.0769	0.0769		0.0769	0.0769		1,213.5676	1,213.5676	0.0233	0.0223	1,220.7792
Mobile	5.4497	5.4226	55.0172	0.1241	13.3969	0.0877	13.4845	3.5687	0.0814	3.6501		12,656.6489	12,656.6489	0.8227	0.5049	12,827.6676
Total	**13.4911**	**6.7060**	**84.3213**	**0.1317**	**13.3969**	**0.3248**	**13.7216**	**3.5687**	**0.3185**	**3.8872**	**0.0000**	**13,922.3206**	**13,922.3206**	**0.8960**	**0.5271**	**14,101.8029**

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	7.9301	0.3328	28.8996	1.5300e-003		0.1603	0.1603		0.1603	0.1603	0.0000	52.1040	52.1040	0.0501	0.0000	53.3560
Energy	0.1112	0.9506	0.4045	6.0700e-003		0.0769	0.0769		0.0769	0.0769		1,213.5676	1,213.5676	0.0233	0.0223	1,220.7792
Mobile	5.4497	5.4226	55.0172	0.1241	13.3969	0.0877	13.4845	3.5687	0.0814	3.6501		12,656.6489	12,656.6489	0.8227	0.5049	12,827.6676
Total	**13.4911**	**6.7060**	**84.3213**	**0.1317**	**13.3969**	**0.3248**	**13.7216**	**3.5687**	**0.3185**	**3.8872**	**0.0000**	**13,922.3206**	**13,922.3206**	**0.8960**	**0.5271**	**14,101.8029**

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	Demolition	Demolition	12/1/2022	12/28/2022	5	20	
2	Grading	Grading	12/29/2022	1/9/2023	5	8	
3	Building Construction	Building Construction	1/10/2023	11/27/2023	5	230	
4	Paving	Paving	11/28/2023	12/21/2023	5	18	
5	Architectural Coating	Architectural Coating	12/22/2023	1/16/2024	5	18	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 8

Acres of Paving: 1.16

Residential Indoor: 655,981; Residential Outdoor: 218,660; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 12,530 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Architectural Coating	Air Compressors	2	6.00	78	0.48
Paving	Cement and Mortar Mixers	0	6.00	9	0.56
Demolition	Concrete/Industrial Saws	0	8.00	81	0.73
Building Construction	Cranes	1	7.00	231	0.29
Demolition	Excavators	1	8.00	158	0.38
Grading	Excavators	1	8.00	158	0.38

Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Grading	Graders	1	8.00	187	0.41
Paving	Pavers	1	8.00	130	0.42
Paving	Paving Equipment	1	6.00	132	0.36
Paving	Rollers	2	6.00	30	0.38
Demolition	Rubber Tired Dozers	1	8.00	247	0.40
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Demolition	Rubber Tired Loaders	1	8.00	203	0.36
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Grading	Tractors/Loaders/Backhoes	3	8.00	97	0.37
Paving	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Grading	Bore/Drill Rigs	1	8.00	221	0.50
Building Construction	Welders	2	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
Demolition	3	8.00	0.00	347.00	14.70	6.90	40.00	LD_Mix	HDT_Mix	HHDT
Grading	7	18.00	0.00	1,950.00	14.70	6.90	40.00	LD_Mix	HDT_Mix	HHDT
Building Construction	10	340.00	72.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Paving	5	13.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	2	68.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Water Exposed Area

Clean Paved Roads

3.2 Demolition - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					3.7555	0.0000	3.7555	0.5686	0.0000	0.5686			0.0000			0.0000
Off-Road	1.3324	13.6107	8.3760	0.0200		0.6053	0.6053		0.5568	0.5568		1,935.743 3	1,935.743 3	0.6261		1,951.394 7
Total	**1.3324**	**13.6107**	**8.3760**	**0.0200**	**3.7555**	**0.6053**	**4.3608**	**0.5686**	**0.5568**	**1.1255**		**1,935.743 3**	**1,935.743 3**	**0.6261**		**1,951.394 7**

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	0.1429	5.4990	1.1198	0.0211	0.6070	0.0431	0.6501	0.1664	0.0412	0.2076		2,311.390 6	2,311.390 6	0.1241	0.3668	2,423.789 0
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	0.0277	0.0202	0.3149	8.2000e-004	0.0894	5.7000e-004	0.0900	0.0237	5.3000e-004	0.0242		82.6754	82.6754	2.2500e-003	2.0000e-003	83.3282
Total	**0.1706**	**5.5192**	**1.4347**	**0.0219**	**0.6964**	**0.0436**	**0.7401**	**0.1901**	**0.0417**	**0.2318**		**2,394.066 0**	**2,394.066 0**	**0.1263**	**0.3688**	**2,507.117 2**

3.2 Demolition - 2022

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					3.7555	0.0000	3.7555	0.5686	0.0000	0.5686			0.0000			0.0000
Off-Road	1.3324	13.6107	8.3760	0.0200		0.6053	0.6053		0.5568	0.5568	0.0000	1,935.743 3	1,935.743 3	0.6261		1,951.394 7
Total	**1.3324**	**13.6107**	**8.3760**	**0.0200**	**3.7555**	**0.6053**	**4.3608**	**0.5686**	**0.5568**	**1.1255**	**0.0000**	**1,935.743 3**	**1,935.743 3**	**0.6261**		**1,951.394 7**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.1429	5.4990	1.1198	0.0211	0.3960	0.0431	0.4390	0.1146	0.0412	0.1558		2,311.390 6	2,311.390 6	0.1241	0.3668	2,423.789 0
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	0.0277	0.0202	0.3149	8.2000e-004	0.0537	5.7000e-004	0.0542	0.0149	5.3000e-004	0.0155		82.6754	82.6754	2.2500e-003	2.0000e-003	83.3282
Total	**0.1706**	**5.5192**	**1.4347**	**0.0219**	**0.4496**	**0.0436**	**0.4933**	**0.1295**	**0.0417**	**0.1713**		**2,394.066 0**	**2,394.066 0**	**0.1263**	**0.3688**	**2,507.117 2**

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					7.3031	0.0000	7.3031	3.4581	0.0000	3.4581			0.0000			0.0000
Off-Road	2.1739	23.1329	17.3241	0.0391		1.0140	1.0140		0.9328	0.9328		3,790.175 0	3,790.175 0	1.2258		3,820.820 5
Total	**2.1739**	**23.1329**	**17.3241**	**0.0391**	**7.3031**	**1.0140**	**8.3171**	**3.4581**	**0.9328**	**4.3910**		**3,790.175 0**	**3,790.175 0**	**1.2258**		**3,820.820 5**

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	2.0080	77.2557	15.7321	0.2963	8.5279	0.6049	9.1328	2.3376	0.5788	2.9164		32,472.70 69	32,472.70 69	1.7433	5.1527	34,051.79 01
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	0.0623	0.0455	0.7085	1.8400e-003	0.2012	1.2900e-003	0.2025	0.0534	1.1900e-003	0.0545		186.0196	186.0196	5.0700e-003	4.5000e-003	187.4885
Total	**2.0703**	**77.3012**	**16.4405**	**0.2982**	**8.7291**	**0.6062**	**9.3353**	**2.3910**	**0.5800**	**2.9709**		**32,658.72 65**	**32,658.72 65**	**1.7484**	**5.1572**	**34,239.27 86**

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					7.3031	0.0000	7.3031	3.4581	0.0000	3.4581			0.0000			0.0000
Off-Road	2.1739	23.1329	17.3241	0.0391		1.0140	1.0140		0.9328	0.9328	0.0000	3,790.175 0	3,790.175 0	1.2258		3,820.820 5
Total	**2.1739**	**23.1329**	**17.3241**	**0.0391**	**7.3031**	**1.0140**	**8.3171**	**3.4581**	**0.9328**	**4.3910**	**0.0000**	**3,790.175 0**	**3,790.175 0**	**1.2258**		**3,820.820 5**

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	2.0080	77.2557	15.7321	0.2963	5.5630	0.6049	6.1680	1.6099	0.5788	2.1886		32,472.70 69	32,472.70 69	1.7433	5.1527	34,051.79 01
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	0.0623	0.0455	0.7085	1.8400e-003	0.1207	1.2900e-003	0.1220	0.0336	1.1900e-003	0.0348		186.0196	186.0196	5.0700e-003	4.5000e-003	187.4885
Total	**2.0703**	**77.3012**	**16.4405**	**0.2982**	**5.6838**	**0.6062**	**6.2900**	**1.6435**	**0.5800**	**2.2234**		**32,658.72 65**	**32,658.72 65**	**1.7484**	**5.1572**	**34,239.27 86**

3.3 Grading - 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					
Fugitive Dust					7.3031	0.0000	7.3031	3.4581	0.0000	3.4581			0.0000			0.0000
Off-Road	1.9271	19.9856	16.7937	0.0392		0.8413	0.8413		0.7740	0.7740		3,792.6713	3,792.6713	1.2266		3,823.3369
Total	**1.9271**	**19.9856**	**16.7937**	**0.0392**	**7.3031**	**0.8413**	**8.1444**	**3.4581**	**0.7740**	**4.2321**		**3,792.6713**	**3,792.6713**	**1.2266**		**3,823.3369**

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	0.7945	59.2264	13.3465	0.2788	8.5281	0.3988	8.9269	2.3377	0.3815	2.7192		30,649.1817	30,649.1817	1.7070	4.8675	32,142.3855
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	0.0576	0.0402	0.6505	1.7800e-003	0.2012	1.2100e-003	0.2024	0.0534	1.1100e-003	0.0545		180.0136	180.0136	4.5400e-003	4.1500e-003	181.3650
Total	**0.8521**	**59.2666**	**13.9970**	**0.2806**	**8.7293**	**0.4000**	**9.1293**	**2.3911**	**0.3826**	**2.7737**		**30,829.1952**	**30,829.1952**	**1.7116**	**4.8717**	**32,323.7505**

3.3 Grading - 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					
Fugitive Dust					7.3031	0.0000	7.3031	3.4581	0.0000	3.4581			0.0000			0.0000
Off-Road	1.9271	19.9856	16.7937	0.0392		0.8413	0.8413		0.7740	0.7740	0.0000	3,792.6713	3,792.6713	1.2266		3,823.3369
Total	**1.9271**	**19.9856**	**16.7937**	**0.0392**	**7.3031**	**0.8413**	**8.1444**	**3.4581**	**0.7740**	**4.2321**	**0.0000**	**3,792.6713**	**3,792.6713**	**1.2266**		**3,823.3369**

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	0.7945	59.2264	13.3465	0.2788	5.5633	0.3988	5.9620	1.6100	0.3815	1.9915		30,649.1817	30,649.1817	1.7070	4.8675	32,142.3855
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	0.0576	0.0402	0.6505	1.7800e-003	0.1207	1.2100e-003	0.1220	0.0336	1.1100e-003	0.0347		180.0136	180.0136	4.5400e-003	4.1500e-003	181.3650
Total	**0.8521**	**59.2666**	**13.9970**	**0.2806**	**5.6840**	**0.4000**	**6.0840**	**1.6436**	**0.3826**	**2.0262**		**30,829.1952**	**30,829.1952**	**1.7116**	**4.8717**	**32,323.7505**

3.4 Building Construction - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.8272	15.8054	17.9219	0.0295		0.7549	0.7549		0.7136	0.7136		2,762.6877	2,762.6877	0.6305		2,778.4497
Total	**1.8272**	**15.8054**	**17.9219**	**0.0295**		**0.7549**	**0.7549**		**0.7136**	**0.7136**		**2,762.6877**	**2,762.6877**	**0.6305**		**2,778.4497**

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	0.0829	2.7636	1.0706	0.0134	0.4612	0.0139	0.4751	0.1328	0.0133	0.1461		1,442.0338	1,442.0338	0.0483	0.2073	1,505.0240
Worker	1.0881	0.7585	12.2876	0.0336	3.8004	0.0229	3.8233	1.0079	0.0211	1.0289		3,400.2563	3,400.2563	0.0857	0.0785	3,425.7837
Total	**1.1710**	**3.5221**	**13.3582**	**0.0470**	**4.2616**	**0.0368**	**4.2983**	**1.1407**	**0.0343**	**1.1750**		**4,842.2901**	**4,842.2901**	**0.1341**	**0.2858**	**4,930.8077**

3.4 Building Construction - 2023

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.8272	15.8054	17.9219	0.0295		0.7549	0.7549		0.7136	0.7136	0.0000	2,762.687 7	2,762.687 7	0.6305		2,778.449 7
Total	**1.8272**	**15.8054**	**17.9219**	**0.0295**		**0.7549**	**0.7549**		**0.7136**	**0.7136**	**0.0000**	**2,762.687 7**	**2,762.687 7**	**0.6305**		**2,778.449 7**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0829	2.7636	1.0706	0.0134	0.3101	0.0139	0.3240	0.0957	0.0133	0.1090		1,442.033 8	1,442.033 8	0.0483	0.2073	1,505.024 0
Worker	1.0881	0.7585	12.2876	0.0336	2.2806	0.0229	2.3034	0.6348	0.0211	0.6559		3,400.256 3	3,400.256 3	0.0857	0.0785	3,425.783 7
Total	**1.1710**	**3.5221**	**13.3582**	**0.0470**	**2.5907**	**0.0368**	**2.6275**	**0.7306**	**0.0343**	**0.7649**		**4,842.290 1**	**4,842.290 1**	**0.1341**	**0.2858**	**4,930.807 7**

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	0.6706	5.8032	8.3145	0.0125		0.2866	0.2866		0.2637	0.2637		1,211.2400	1,211.2400	0.3917		1,221.0335
Paving	0.0495					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.7201**	**5.8032**	**8.3145**	**0.0125**		**0.2866**	**0.2866**		**0.2637**	**0.2637**		**1,211.2400**	**1,211.2400**	**0.3917**		**1,221.0335**

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	0.0416	0.0290	0.4698	1.2900e-003	0.1453	8.7000e-004	0.1462	0.0385	8.0000e-004	0.0393		130.0098	130.0098	3.2800e-003	3.0000e-003	130.9859
Total	**0.0416**	**0.0290**	**0.4698**	**1.2900e-003**	**0.1453**	**8.7000e-004**	**0.1462**	**0.0385**	**8.0000e-004**	**0.0393**		**130.0098**	**130.0098**	**3.2800e-003**	**3.0000e-003**	**130.9859**

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	0.6706	5.8032	8.3145	0.0125		0.2866	0.2866		0.2637	0.2637	0.0000	1,211.2400	1,211.2400	0.3917		1,221.0335
Paving	0.0495					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.7201**	**5.8032**	**8.3145**	**0.0125**		**0.2866**	**0.2866**		**0.2637**	**0.2637**	**0.0000**	**1,211.2400**	**1,211.2400**	**0.3917**		**1,221.0335**

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	0.0416	0.0290	0.4698	1.2900e-003	0.0872	8.7000e-004	0.0881	0.0243	8.0000e-004	0.0251		130.0098	130.0098	3.2800e-003	3.0000e-003	130.9859
Total	**0.0416**	**0.0290**	**0.4698**	**1.2900e-003**	**0.0872**	**8.7000e-004**	**0.0881**	**0.0243**	**8.0000e-004**	**0.0251**		**130.0098**	**130.0098**	**3.2800e-003**	**3.0000e-003**	**130.9859**

3.6 Architectural Coating - 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	115.8365					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.3833	2.6060	3.6222	5.9400e-003		0.1416	0.1416		0.1416	0.1416		562.8961	562.8961	0.0337		563.7380
Total	**116.2198**	**2.6060**	**3.6222**	**5.9400e-003**		**0.1416**	**0.1416**		**0.1416**	**0.1416**		**562.8961**	**562.8961**	**0.0337**		**563.7380**

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	0.2176	0.1517	2.4575	6.7300e-003	0.7601	4.5700e-003	0.7647	0.2016	4.2100e-003	0.2058		680.0513	680.0513	0.0172	0.0157	685.1567
Total	**0.2176**	**0.1517**	**2.4575**	**6.7300e-003**	**0.7601**	**4.5700e-003**	**0.7647**	**0.2016**	**4.2100e-003**	**0.2058**		**680.0513**	**680.0513**	**0.0172**	**0.0157**	**685.1567**

3.6 Architectural Coating - 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	115.8365					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.3833	2.6060	3.6222	5.9400e-003		0.1416	0.1416		0.1416	0.1416	0.0000	562.8961	562.8961	0.0337		563.7380
Total	**116.2198**	**2.6060**	**3.6222**	**5.9400e-003**		**0.1416**	**0.1416**		**0.1416**	**0.1416**	**0.0000**	**562.8961**	**562.8961**	**0.0337**		**563.7380**

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	0.2176	0.1517	2.4575	6.7300e-003	0.4561	4.5700e-003	0.4607	0.1270	4.2100e-003	0.1312		680.0513	680.0513	0.0172	0.0157	685.1567
Total	**0.2176**	**0.1517**	**2.4575**	**6.7300e-003**	**0.4561**	**4.5700e-003**	**0.4607**	**0.1270**	**4.2100e-003**	**0.1312**		**680.0513**	**680.0513**	**0.0172**	**0.0157**	**685.1567**

3.6 Architectural Coating - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	115.8365					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.3615	2.4376	3.6203	5.9400e-003		0.1218	0.1218		0.1218	0.1218		562.8961	562.8961	0.0317		563.6885
Total	**116.1980**	**2.4376**	**3.6203**	**5.9400e-003**		**0.1218**	**0.1218**		**0.1218**	**0.1218**		**562.8961**	**562.8961**	**0.0317**		**563.6885**

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	0.2028	0.1354	2.2836	6.5400e-003	0.7601	4.3800e-003	0.7645	0.2016	4.0300e-003	0.2056		660.7765	660.7765	0.0155	0.0146	665.5136
Total	**0.2028**	**0.1354**	**2.2836**	**6.5400e-003**	**0.7601**	**4.3800e-003**	**0.7645**	**0.2016**	**4.0300e-003**	**0.2056**		**660.7765**	**660.7765**	**0.0155**	**0.0146**	**665.5136**

3.6 Architectural Coating - 2024

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	115.8365					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.3615	2.4376	3.6203	5.9400e-003		0.1218	0.1218		0.1218	0.1218	0.0000	562.8961	562.8961	0.0317		563.6885
Total	**116.1980**	**2.4376**	**3.6203**	**5.9400e-003**		**0.1218**	**0.1218**		**0.1218**	**0.1218**	**0.0000**	**562.8961**	**562.8961**	**0.0317**		**563.6885**

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	0.2028	0.1354	2.2836	6.5400e-003	0.4561	4.3800e-003	0.4605	0.1270	4.0300e-003	0.1310		660.7765	660.7765	0.0155	0.0146	665.5136
Total	**0.2028**	**0.1354**	**2.2836**	**6.5400e-003**	**0.4561**	**4.3800e-003**	**0.4605**	**0.1270**	**4.0300e-003**	**0.1310**		**660.7765**	**660.7765**	**0.0155**	**0.0146**	**665.5136**

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	5.4497	5.4226	55.0172	0.1241	13.3969	0.0877	13.4845	3.5687	0.0814	3.6501		12,656.6489	12,656.6489	0.8227	0.5049	12,827.6676
Unmitigated	5.4497	5.4226	55.0172	0.1241	13.3969	0.0877	13.4845	3.5687	0.0814	3.6501		12,656.6489	12,656.6489	0.8227	0.5049	12,827.6676

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Apartments Mid Rise	1,862.00	1,862.00	1862.00	6,362,737	6,362,737
Parking Lot	0.00	0.00	0.00		
Unenclosed Parking with Elevator	0.00	0.00	0.00		
Total	1,862.00	1,862.00	1,862.00	6,362,737	6,362,737

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
Apartments Mid Rise	14.70	5.90	8.70	40.20	19.20	40.60	86	11	3
Parking Lot	16.60	8.40	6.90	0.00	0.00	0.00	0	0	0
Unenclosed Parking with	16.60	8.40	6.90	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Apartments Mid Rise	0.540171	0.064547	0.189075	0.126673	0.023412	0.006384	0.010926	0.008089	0.000929	0.000597	0.025155	0.000706	0.003335
Parking Lot	0.540171	0.064547	0.189075	0.126673	0.023412	0.006384	0.010926	0.008089	0.000929	0.000597	0.025155	0.000706	0.003335
Unenclosed Parking with Elevator	0.540171	0.064547	0.189075	0.126673	0.023412	0.006384	0.010926	0.008089	0.000929	0.000597	0.025155	0.000706	0.003335

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.1112	0.9506	0.4045	6.0700e-003		0.0769	0.0769		0.0769	0.0769		1,213.5676	1,213.5676	0.0233	0.0223	1,220.7792
NaturalGas Unmitigated	0.1112	0.9506	0.4045	6.0700e-003		0.0769	0.0769		0.0769	0.0769		1,213.5676	1,213.5676	0.0233	0.0223	1,220.7792

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					
Apartments Mid Rise	10315.3	0.1112	0.9506	0.4045	6.0700e-003		0.0769	0.0769		0.0769	0.0769		1,213.5676	1,213.5676	0.0233	0.0223	1,220.7792
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
Unenclosed Parking with Elevator	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
Total		**0.1112**	**0.9506**	**0.4045**	**6.0700e-003**		**0.0769**	**0.0769**		**0.0769**	**0.0769**		**1,213.5676**	**1,213.5676**	**0.0233**	**0.0223**	**1,220.7792**

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					
Apartments Mid Rise	10.3153	0.1112	0.9506	0.4045	6.0700e-003		0.0769	0.0769		0.0769	0.0769		1,213.5676	1,213.5676	0.0233	0.0223	1,220.7792
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
Unenclosed Parking with Elevator	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
Total		**0.1112**	**0.9506**	**0.4045**	**6.0700e-003**		**0.0769**	**0.0769**		**0.0769**	**0.0769**		**1,213.5676**	**1,213.5676**	**0.0233**	**0.0223**	**1,220.7792**

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	7.9301	0.3328	28.8996	1.5300e-003		0.1603	0.1603		0.1603	0.1603	0.0000	52.1040	52.1040	0.0501	0.0000	53.3560
Unmitigated	7.9301	0.3328	28.8996	1.5300e-003		0.1603	0.1603		0.1603	0.1603	0.0000	52.1040	52.1040	0.0501	0.0000	53.3560

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	0.5713					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	6.4880					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Hearth	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.8709	0.3328	28.8996	1.5300e-003		0.1603	0.1603		0.1603	0.1603		52.1040	52.1040	0.0501		53.3560
Total	**7.9302**	**0.3328**	**28.8996**	**1.5300e-003**		**0.1603**	**0.1603**		**0.1603**	**0.1603**	**0.0000**	**52.1040**	**52.1040**	**0.0501**	**0.0000**	**53.3560**

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	0.5713					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	6.4880					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Hearth	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.8709	0.3328	28.8996	1.5300e-003		0.1603	0.1603		0.1603	0.1603		52.1040	52.1040	0.0501		53.3560
Total	**7.9302**	**0.3328**	**28.8996**	**1.5300e-003**		**0.1603**	**0.1603**		**0.1603**	**0.1603**	**0.0000**	**52.1040**	**52.1040**	**0.0501**	**0.0000**	**53.3560**

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

NFC - Future

Los Angeles-South Coast County, Winter

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Apartments Mid Rise	350.00	Dwelling Unit	2.48	323,941.00	1001
Unenclosed Parking with Elevator	468.00	Space	0.82	193,625.00	0
Parking Lot	38.00	Space	0.34	15,200.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	33
Climate Zone	12			**Operational Year**	2025
Utility Company	Los Angeles Department of Water & Power				
CO2 Intensity (lb/MWhr)	691.98	**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 Exemption's model.

Land Use - See SWAPE comment regarding "Failure to Model Proposed Surface Parking."

Construction Phase - See SWAPE comment regarding "Unsubstantiated Changes to Individual Construction Phase Lengths"

Off-road Equipment - Consistent with the Exemption's model.

Grading - Material import and export consistent with the Exemption's model. See SWAPE comment regarding "Unsubstantiated Reduction to Acres of Grading Value."

Demolition - Consistent with the Exemption's model.

Trips and VMT - Hauling trip lengths consistent with the Exemption's model.

Vehicle Trips - Consistent with the Exemption's model.

Woodstoves - Consistent with the Exemption's model.

Off-road Equipment - Consistent with the Exemption's model.

Off-road Equipment - Consistent with the Exemption's model.

Off-road Equipment - Consistent with the Exemption's model.

Off-road Equipment - Consistent with the Exemption's model.

Construction Off-road Equipment Mitigation - Consistent with the Exemption's model.

Table Name	Column Name	Default Value	New Value
tblConstDustMitigation	CleanPavedRoadPercentReduction	0	46
tblFireplaces	FireplaceDayYear	25.00	0.00
tblFireplaces	FireplaceHourDay	3.00	0.00
tblFireplaces	FireplaceWoodMass	1,019.20	0.00
tblFireplaces	NumberGas	297.50	0.00
tblFireplaces	NumberNoFireplace	35.00	0.00
tblFireplaces	NumberWood	17.50	0.00
tblGrading	MaterialExported	0.00	14,440.00
tblGrading	MaterialImported	0.00	1,160.00
tblLandUse	LandUseSquareFeet	350,000.00	323,941.00
tblLandUse	LandUseSquareFeet	187,200.00	193,625.00
tblLandUse	LotAcreage	9.21	2.48
tblLandUse	LotAcreage	4.21	0.82
tblOffRoadEquipment	HorsePower	80.00	30.00
tblOffRoadEquipment	LoadFactor	0.36	0.36
tblOffRoadEquipment	LoadFactor	0.50	0.50
tblOffRoadEquipment	OffRoadEquipmentType		Rubber Tired Loaders
tblOffRoadEquipment	OffRoadEquipmentType		Bore/Drill Rigs
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00

tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblTripsAndVMT	HaulingTripLength	20.00	40.00
tblTripsAndVMT	HaulingTripLength	20.00	40.00
tblVehicleTrips	ST_TR	4.91	5.32
tblVehicleTrips	SU_TR	4.09	5.32
tblVehicleTrips	WD_TR	5.44	5.32
tblWoodstoves	NumberCatalytic	17.50	0.00
tblWoodstoves	NumberNoncatalytic	17.50	0.00
tblWoodstoves	WoodstoveDayYear	25.00	0.00
tblWoodstoves	WoodstoveWoodMass	999.60	0.00

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2022	4.2212	103.5116	33.8655	0.3372	16.0322	1.6208	17.6530	5.8491	1.5134	7.3625	0.0000	36,443.9158	36,443.9158	2.9727	5.1585	38,055.4543
2023	116.4536	81.7291	30.8464	0.3198	16.0324	1.2418	17.2742	5.8492	1.1571	7.0063	0.0000	34,628.8742	34,628.8742	2.9364	4.8748	36,154.9632
2024	116.4166	2.5871	5.7211	0.0121	0.7601	0.1262	0.8863	0.2016	0.1259	0.3274	0.0000	1,188.8970	1,188.8970	0.0474	0.0156	1,194.7270
Maximum	**116.4536**	**103.5116**	**33.8655**	**0.3372**	**16.0324**	**1.6208**	**17.6530**	**5.8492**	**1.5134**	**7.3625**	**0.0000**	**36,443.9158**	**36,443.9158**	**2.9727**	**5.1585**	**38,055.4543**

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	4.2212	103.5116	33.8655	0.3372	12.9869	1.6208	14.6077	5.1016	1.5134	6.6150	0.0000	36,443.9158	36,443.9158	2.9727	5.1585	38,055.4543
2023	116.4536	81.7291	30.8464	0.3198	12.9871	1.2418	14.2289	5.1017	1.1571	6.2588	0.0000	34,628.8742	34,628.8742	2.9364	4.8748	36,154.9632
2024	116.4166	2.5871	5.7211	0.0121	0.4561	0.1262	0.5823	0.1270	0.1259	0.2528	0.0000	1,188.8970	1,188.8970	0.0474	0.0156	1,194.7270
Maximum	**116.4536**	**103.5116**	**33.8655**	**0.3372**	**12.9871**	**1.6208**	**14.6077**	**5.1017**	**1.5134**	**6.6150**	**0.0000**	**36,443.9158**	**36,443.9158**	**2.9727**	**5.1585**	**38,055.4543**

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	19.48	0.00	17.86	13.19	0.00	10.68	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	7.9301	0.3328	28.8996	1.5300e-003		0.1603	0.1603		0.1603	0.1603	0.0000	52.1040	52.1040	0.0501	0.0000	53.3560
Energy	0.1112	0.9506	0.4045	6.0700e-003		0.0769	0.0769		0.0769	0.0769		1,213.5676	1,213.5676	0.0233	0.0223	1,220.7792
Mobile	5.3536	5.8524	53.9001	0.1189	13.3969	0.0877	13.4846	3.5687	0.0814	3.6501		12,124.7394	12,124.7394	0.8449	0.5267	12,302.8032
Total	**13.3950**	**7.1358**	**83.2042**	**0.1265**	**13.3969**	**0.3248**	**13.7217**	**3.5687**	**0.3186**	**3.8873**	**0.0000**	**13,390.4110**	**13,390.4110**	**0.9183**	**0.5489**	**13,576.9384**

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	7.9301	0.3328	28.8996	1.5300e-003		0.1603	0.1603		0.1603	0.1603	0.0000	52.1040	52.1040	0.0501	0.0000	53.3560
Energy	0.1112	0.9506	0.4045	6.0700e-003		0.0769	0.0769		0.0769	0.0769		1,213.5676	1,213.5676	0.0233	0.0223	1,220.7792
Mobile	5.3536	5.8524	53.9001	0.1189	13.3969	0.0877	13.4846	3.5687	0.0814	3.6501		12,124.7394	12,124.7394	0.8449	0.5267	12,302.8032
Total	**13.3950**	**7.1358**	**83.2042**	**0.1265**	**13.3969**	**0.3248**	**13.7217**	**3.5687**	**0.3186**	**3.8873**	**0.0000**	**13,390.4110**	**13,390.4110**	**0.9183**	**0.5489**	**13,576.9384**

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	Demolition	Demolition	12/1/2022	12/28/2022	5	20	
2	Grading	Grading	12/29/2022	1/9/2023	5	8	
3	Building Construction	Building Construction	1/10/2023	11/27/2023	5	230	
4	Paving	Paving	11/28/2023	12/21/2023	5	18	
5	Architectural Coating	Architectural Coating	12/22/2023	1/16/2024	5	18	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 8

Acres of Paving: 1.16

Residential Indoor: 655,981; Residential Outdoor: 218,660; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 12,530 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Architectural Coating	Air Compressors	2	6.00	78	0.48
Paving	Cement and Mortar Mixers	0	6.00	9	0.56
Demolition	Concrete/Industrial Saws	0	8.00	81	0.73
Building Construction	Cranes	1	7.00	231	0.29
Demolition	Excavators	1	8.00	158	0.38
Grading	Excavators	1	8.00	158	0.38

Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Grading	Graders	1	8.00	187	0.41
Paving	Pavers	1	8.00	130	0.42
Paving	Paving Equipment	1	6.00	132	0.36
Paving	Rollers	2	6.00	30	0.38
Demolition	Rubber Tired Dozers	1	8.00	247	0.40
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Demolition	Rubber Tired Loaders	1	8.00	203	0.36
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Grading	Tractors/Loaders/Backhoes	3	8.00	97	0.37
Paving	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Grading	Bore/Drill Rigs	1	8.00	221	0.50
Building Construction	Welders	2	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
Demolition	3	8.00	0.00	347.00	14.70	6.90	40.00	LD_Mix	HDT_Mix	HHDT
Grading	7	18.00	0.00	1,950.00	14.70	6.90	40.00	LD_Mix	HDT_Mix	HHDT
Building Construction	10	340.00	72.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Paving	5	13.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	2	68.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Water Exposed Area

Clean Paved Roads

3.2 Demolition - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					3.7555	0.0000	3.7555	0.5686	0.0000	0.5686			0.0000			0.0000
Off-Road	1.3324	13.6107	8.3760	0.0200		0.6053	0.6053		0.5568	0.5568		1,935.743 3	1,935.743 3	0.6261		1,951.394 7
Total	**1.3324**	**13.6107**	**8.3760**	**0.0200**	**3.7555**	**0.6053**	**4.3608**	**0.5686**	**0.5568**	**1.1255**		**1,935.743 3**	**1,935.743 3**	**0.6261**		**1,951.394 7**

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	0.1410	5.7177	1.1311	0.0211	0.6070	0.0431	0.6501	0.1664	0.0412	0.2076		2,311.735 8	2,311.735 8	0.1240	0.3668	2,424.151 7
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	0.0296	0.0223	0.2891	7.7000e-004	0.0894	5.7000e-004	0.0900	0.0237	5.3000e-004	0.0242		78.3043	78.3043	2.2800e-003	2.1400e-003	78.9987
Total	**0.1706**	**5.7401**	**1.4202**	**0.0219**	**0.6964**	**0.0437**	**0.7401**	**0.1901**	**0.0418**	**0.2319**		**2,390.040 1**	**2,390.040 1**	**0.1263**	**0.3690**	**2,503.150 4**

3.2 Demolition - 2022

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					3.7555	0.0000	3.7555	0.5686	0.0000	0.5686			0.0000			0.0000
Off-Road	1.3324	13.6107	8.3760	0.0200		0.6053	0.6053		0.5568	0.5568	0.0000	1,935.743 3	1,935.743 3	0.6261		1,951.394 7
Total	**1.3324**	**13.6107**	**8.3760**	**0.0200**	**3.7555**	**0.6053**	**4.3608**	**0.5686**	**0.5568**	**1.1255**	**0.0000**	**1,935.743 3**	**1,935.743 3**	**0.6261**		**1,951.394 7**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.1410	5.7177	1.1311	0.0211	0.3960	0.0431	0.4391	0.1146	0.0412	0.1558		2,311.735 8	2,311.735 8	0.1240	0.3668	2,424.151 7
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	0.0296	0.0223	0.2891	7.7000e-004	0.0537	5.7000e-004	0.0542	0.0149	5.3000e-004	0.0155		78.3043	78.3043	2.2800e-003	2.1400e-003	78.9987
Total	**0.1706**	**5.7401**	**1.4202**	**0.0219**	**0.4496**	**0.0437**	**0.4933**	**0.1295**	**0.0418**	**0.1713**		**2,390.040 1**	**2,390.040 1**	**0.1263**	**0.3690**	**2,503.150 4**

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					7.3031	0.0000	7.3031	3.4581	0.0000	3.4581			0.0000			0.0000
Off-Road	2.1739	23.1329	17.3241	0.0391		1.0140	1.0140		0.9328	0.9328		3,790.175 0	3,790.175 0	1.2258		3,820.820 5
Total	**2.1739**	**23.1329**	**17.3241**	**0.0391**	**7.3031**	**1.0140**	**8.3171**	**3.4581**	**0.9328**	**4.3910**		**3,790.175 0**	**3,790.175 0**	**1.2258**		**3,820.820 5**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	1.9806	80.3285	15.8909	0.2964	8.5279	0.6056	9.1334	2.3376	0.5794	2.9170		32,477.55 62	32,477.55 62	1.7418	5.1536	34,056.88 68
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	0.0667	0.0502	0.6505	1.7400e-003	0.2012	1.2900e-003	0.2025	0.0534	1.1900e-003	0.0545		176.1846	176.1846	5.1300e-003	4.8100e-003	177.7470
Total	**2.0473**	**80.3787**	**16.5414**	**0.2981**	**8.7291**	**0.6069**	**9.3359**	**2.3910**	**0.5806**	**2.9715**		**32,653.74 08**	**32,653.74 08**	**1.7469**	**5.1585**	**34,234.63 38**

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					7.3031	0.0000	7.3031	3.4581	0.0000	3.4581			0.0000			0.0000
Off-Road	2.1739	23.1329	17.3241	0.0391		1.0140	1.0140		0.9328	0.9328	0.0000	3,790.175 0	3,790.175 0	1.2258		3,820.820 5
Total	**2.1739**	**23.1329**	**17.3241**	**0.0391**	**7.3031**	**1.0140**	**8.3171**	**3.4581**	**0.9328**	**4.3910**	**0.0000**	**3,790.175 0**	**3,790.175 0**	**1.2258**		**3,820.820 5**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	1.9806	80.3285	15.8909	0.2964	5.5630	0.6056	6.1686	1.6099	0.5794	2.1892		32,477.55 62	32,477.55 62	1.7418	5.1536	34,056.88 68
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	0.0667	0.0502	0.6505	1.7400e-003	0.1207	1.2900e-003	0.1220	0.0336	1.1900e-003	0.0348		176.1846	176.1846	5.1300e-003	4.8100e-003	177.7470
Total	**2.0473**	**80.3787**	**16.5414**	**0.2981**	**5.6838**	**0.6069**	**6.2906**	**1.6435**	**0.5806**	**2.2240**		**32,653.74 08**	**32,653.74 08**	**1.7469**	**5.1585**	**34,234.63 38**

3.3 Grading - 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					
Fugitive Dust					7.3031	0.0000	7.3031	3.4581	0.0000	3.4581			0.0000			0.0000
Off-Road	1.9271	19.9856	16.7937	0.0392		0.8413	0.8413		0.7740	0.7740		3,792.6713	3,792.6713	1.2266		3,823.3369
Total	**1.9271**	**19.9856**	**16.7937**	**0.0392**	**7.3031**	**0.8413**	**8.1444**	**3.4581**	**0.7740**	**4.2321**		**3,792.6713**	**3,792.6713**	**1.2266**		**3,823.3369**

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	0.7603	61.6991	13.4548	0.2790	8.5281	0.3993	8.9274	2.3377	0.3820	2.7197		30,665.6793	30,665.6793	1.7052	4.8703	32,159.6653
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	0.0619	0.0444	0.5979	1.6900e-003	0.2012	1.2100e-003	0.2024	0.0534	1.1100e-003	0.0545		170.5237	170.5237	4.6000e-003	4.4400e-003	171.9610
Total	**0.8222**	**61.7434**	**14.0527**	**0.2806**	**8.7293**	**0.4005**	**9.1298**	**2.3911**	**0.3831**	**2.7742**		**30,836.2029**	**30,836.2029**	**1.7098**	**4.8748**	**32,331.6263**

3.3 Grading - 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					
Fugitive Dust					7.3031	0.0000	7.3031	3.4581	0.0000	3.4581			0.0000			0.0000
Off-Road	1.9271	19.9856	16.7937	0.0392		0.8413	0.8413		0.7740	0.7740	0.0000	3,792.6713	3,792.6713	1.2266		3,823.3369
Total	**1.9271**	**19.9856**	**16.7937**	**0.0392**	**7.3031**	**0.8413**	**8.1444**	**3.4581**	**0.7740**	**4.2321**	**0.0000**	**3,792.6713**	**3,792.6713**	**1.2266**		**3,823.3369**

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	0.7603	61.6991	13.4548	0.2790	5.5633	0.3993	5.9626	1.6100	0.3820	1.9920		30,665.6793	30,665.6793	1.7052	4.8703	32,159.6653
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	0.0619	0.0444	0.5979	1.6900e-003	0.1207	1.2100e-003	0.1220	0.0336	1.1100e-003	0.0347		170.5237	170.5237	4.6000e-003	4.4400e-003	171.9610
Total	**0.8222**	**61.7434**	**14.0527**	**0.2806**	**5.6840**	**0.4005**	**6.0845**	**1.6436**	**0.3831**	**2.0267**		**30,836.2029**	**30,836.2029**	**1.7098**	**4.8748**	**32,331.6263**

3.4 Building Construction - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.8272	15.8054	17.9219	0.0295		0.7549	0.7549		0.7136	0.7136		2,762.6877	2,762.6877	0.6305		2,778.4497
Total	**1.8272**	**15.8054**	**17.9219**	**0.0295**		**0.7549**	**0.7549**		**0.7136**	**0.7136**		**2,762.6877**	**2,762.6877**	**0.6305**		**2,778.4497**

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	0.0801	2.8935	1.1043	0.0134	0.4612	0.0140	0.4752	0.1328	0.0134	0.1462		1,444.4662	1,444.4662	0.0481	0.2079	1,507.6159
Worker	1.1690	0.8379	11.2943	0.0319	3.8004	0.0229	3.8233	1.0079	0.0211	1.0289		3,221.0022	3,221.0022	0.0869	0.0838	3,248.1527
Total	**1.2491**	**3.7314**	**12.3986**	**0.0453**	**4.2616**	**0.0368**	**4.2984**	**1.1407**	**0.0344**	**1.1751**		**4,665.4684**	**4,665.4684**	**0.1350**	**0.2917**	**4,755.7686**

3.4 Building Construction - 2023

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.8272	15.8054	17.9219	0.0295		0.7549	0.7549		0.7136	0.7136	0.0000	2,762.687 7	2,762.687 7	0.6305		2,778.449 7
Total	**1.8272**	**15.8054**	**17.9219**	**0.0295**		**0.7549**	**0.7549**		**0.7136**	**0.7136**	**0.0000**	**2,762.687 7**	**2,762.687 7**	**0.6305**		**2,778.449 7**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0801	2.8935	1.1043	0.0134	0.3101	0.0140	0.3241	0.0957	0.0134	0.1091		1,444.466 2	1,444.466 2	0.0481	0.2079	1,507.615 9
Worker	1.1690	0.8379	11.2943	0.0319	2.2806	0.0229	2.3034	0.6348	0.0211	0.6559		3,221.002 2	3,221.002 2	0.0869	0.0838	3,248.152 7
Total	**1.2491**	**3.7314**	**12.3986**	**0.0453**	**2.5907**	**0.0368**	**2.6275**	**0.7306**	**0.0344**	**0.7650**		**4,665.468 4**	**4,665.468 4**	**0.1350**	**0.2917**	**4,755.768 6**

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	0.6706	5.8032	8.3145	0.0125		0.2866	0.2866		0.2637	0.2637		1,211.2400	1,211.2400	0.3917		1,221.0335
Paving	0.0495					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.7201**	**5.8032**	**8.3145**	**0.0125**		**0.2866**	**0.2866**		**0.2637**	**0.2637**		**1,211.2400**	**1,211.2400**	**0.3917**		**1,221.0335**

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	0.0447	0.0320	0.4318	1.2200e-003	0.1453	8.7000e-004	0.1462	0.0385	8.0000e-004	0.0393		123.1560	123.1560	3.3200e-003	3.2000e-003	124.1941
Total	**0.0447**	**0.0320**	**0.4318**	**1.2200e-003**	**0.1453**	**8.7000e-004**	**0.1462**	**0.0385**	**8.0000e-004**	**0.0393**		**123.1560**	**123.1560**	**3.3200e-003**	**3.2000e-003**	**124.1941**

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	0.6706	5.8032	8.3145	0.0125		0.2866	0.2866		0.2637	0.2637	0.0000	1,211.2400	1,211.2400	0.3917		1,221.0335
Paving	0.0495					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.7201**	**5.8032**	**8.3145**	**0.0125**		**0.2866**	**0.2866**		**0.2637**	**0.2637**	**0.0000**	**1,211.2400**	**1,211.2400**	**0.3917**		**1,221.0335**

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	0.0447	0.0320	0.4318	1.2200e-003	0.0872	8.7000e-004	0.0881	0.0243	8.0000e-004	0.0251		123.1560	123.1560	3.3200e-003	3.2000e-003	124.1941
Total	**0.0447**	**0.0320**	**0.4318**	**1.2200e-003**	**0.0872**	**8.7000e-004**	**0.0881**	**0.0243**	**8.0000e-004**	**0.0251**		**123.1560**	**123.1560**	**3.3200e-003**	**3.2000e-003**	**124.1941**

3.6 Architectural Coating - 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	115.8365					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.3833	2.6060	3.6222	5.9400e-003		0.1416	0.1416		0.1416	0.1416		562.8961	562.8961	0.0337		563.7380
Total	**116.2198**	**2.6060**	**3.6222**	**5.9400e-003**		**0.1416**	**0.1416**		**0.1416**	**0.1416**		**562.8961**	**562.8961**	**0.0337**		**563.7380**

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	0.2338	0.1676	2.2589	6.3700e-003	0.7601	4.5700e-003	0.7647	0.2016	4.2100e-003	0.2058		644.2005	644.2005	0.0174	0.0168	649.6305
Total	**0.2338**	**0.1676**	**2.2589**	**6.3700e-003**	**0.7601**	**4.5700e-003**	**0.7647**	**0.2016**	**4.2100e-003**	**0.2058**		**644.2005**	**644.2005**	**0.0174**	**0.0168**	**649.6305**

3.6 Architectural Coating - 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	115.8365					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.3833	2.6060	3.6222	5.9400e-003		0.1416	0.1416		0.1416	0.1416	0.0000	562.8961	562.8961	0.0337		563.7380
Total	**116.2198**	**2.6060**	**3.6222**	**5.9400e-003**		**0.1416**	**0.1416**		**0.1416**	**0.1416**	**0.0000**	**562.8961**	**562.8961**	**0.0337**		**563.7380**

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	0.2338	0.1676	2.2589	6.3700e-003	0.4561	4.5700e-003	0.4607	0.1270	4.2100e-003	0.1312		644.2005	644.2005	0.0174	0.0168	649.6305
Total	**0.2338**	**0.1676**	**2.2589**	**6.3700e-003**	**0.4561**	**4.5700e-003**	**0.4607**	**0.1270**	**4.2100e-003**	**0.1312**		**644.2005**	**644.2005**	**0.0174**	**0.0168**	**649.6305**

3.6 Architectural Coating - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	115.8365					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.3615	2.4376	3.6203	5.9400e-003		0.1218	0.1218		0.1218	0.1218		562.8961	562.8961	0.0317		563.6885
Total	**116.1980**	**2.4376**	**3.6203**	**5.9400e-003**		**0.1218**	**0.1218**		**0.1218**	**0.1218**		**562.8961**	**562.8961**	**0.0317**		**563.6885**

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	0.2186	0.1495	2.1009	6.1900e-003	0.7601	4.3800e-003	0.7645	0.2016	4.0300e-003	0.2056		626.0009	626.0009	0.0157	0.0156	631.0386
Total	**0.2186**	**0.1495**	**2.1009**	**6.1900e-003**	**0.7601**	**4.3800e-003**	**0.7645**	**0.2016**	**4.0300e-003**	**0.2056**		**626.0009**	**626.0009**	**0.0157**	**0.0156**	**631.0386**

3.6 Architectural Coating - 2024

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	115.8365					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.3615	2.4376	3.6203	5.9400e-003		0.1218	0.1218		0.1218	0.1218	0.0000	562.8961	562.8961	0.0317		563.6885
Total	**116.1980**	**2.4376**	**3.6203**	**5.9400e-003**		**0.1218**	**0.1218**		**0.1218**	**0.1218**	**0.0000**	**562.8961**	**562.8961**	**0.0317**		**563.6885**

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	0.2186	0.1495	2.1009	6.1900e-003	0.4561	4.3800e-003	0.4605	0.1270	4.0300e-003	0.1310		626.0009	626.0009	0.0157	0.0156	631.0386
Total	**0.2186**	**0.1495**	**2.1009**	**6.1900e-003**	**0.4561**	**4.3800e-003**	**0.4605**	**0.1270**	**4.0300e-003**	**0.1310**		**626.0009**	**626.0009**	**0.0157**	**0.0156**	**631.0386**

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	5.3536	5.8524	53.9001	0.1189	13.3969	0.0877	13.4846	3.5687	0.0814	3.6501		12,124.7394	12,124.7394	0.8449	0.5267	12,302.8032
Unmitigated	5.3536	5.8524	53.9001	0.1189	13.3969	0.0877	13.4846	3.5687	0.0814	3.6501		12,124.7394	12,124.7394	0.8449	0.5267	12,302.8032

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Apartments Mid Rise	1,862.00	1,862.00	1862.00	6,362,737	6,362,737
Parking Lot	0.00	0.00	0.00		
Unenclosed Parking with Elevator	0.00	0.00	0.00		
Total	1,862.00	1,862.00	1,862.00	6,362,737	6,362,737

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
Apartments Mid Rise	14.70	5.90	8.70	40.20	19.20	40.60	86	11	3
Parking Lot	16.60	8.40	6.90	0.00	0.00	0.00	0	0	0
Unenclosed Parking with	16.60	8.40	6.90	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Apartments Mid Rise	0.540171	0.064547	0.189075	0.126673	0.023412	0.006384	0.010926	0.008089	0.000929	0.000597	0.025155	0.000706	0.003335
Parking Lot	0.540171	0.064547	0.189075	0.126673	0.023412	0.006384	0.010926	0.008089	0.000929	0.000597	0.025155	0.000706	0.003335
Unenclosed Parking with Elevator	0.540171	0.064547	0.189075	0.126673	0.023412	0.006384	0.010926	0.008089	0.000929	0.000597	0.025155	0.000706	0.003335

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.1112	0.9506	0.4045	6.0700e-003		0.0769	0.0769		0.0769	0.0769		1,213.5676	1,213.5676	0.0233	0.0223	1,220.7792
NaturalGas Unmitigated	0.1112	0.9506	0.4045	6.0700e-003		0.0769	0.0769		0.0769	0.0769		1,213.5676	1,213.5676	0.0233	0.0223	1,220.7792

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					
Apartments Mid Rise	10315.3	0.1112	0.9506	0.4045	6.0700e-003		0.0769	0.0769		0.0769	0.0769		1,213.5676	1,213.5676	0.0233	0.0223	1,220.7792
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
Unenclosed Parking with Elevator	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
Total		**0.1112**	**0.9506**	**0.4045**	**6.0700e-003**		**0.0769**	**0.0769**		**0.0769**	**0.0769**		**1,213.5676**	**1,213.5676**	**0.0233**	**0.0223**	**1,220.7792**

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					
Apartments Mid Rise	10.3153	0.1112	0.9506	0.4045	6.0700e-003		0.0769	0.0769		0.0769	0.0769		1,213.5676	1,213.5676	0.0233	0.0223	1,220.7792
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
Unenclosed Parking with Elevator	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
Total		**0.1112**	**0.9506**	**0.4045**	**6.0700e-003**		**0.0769**	**0.0769**		**0.0769**	**0.0769**		**1,213.5676**	**1,213.5676**	**0.0233**	**0.0223**	**1,220.7792**

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	7.9301	0.3328	28.8996	1.5300e-003		0.1603	0.1603		0.1603	0.1603	0.0000	52.1040	52.1040	0.0501	0.0000	53.3560
Unmitigated	7.9301	0.3328	28.8996	1.5300e-003		0.1603	0.1603		0.1603	0.1603	0.0000	52.1040	52.1040	0.0501	0.0000	53.3560

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	0.5713					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	6.4880					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Hearth	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.8709	0.3328	28.8996	1.5300e-003		0.1603	0.1603		0.1603	0.1603		52.1040	52.1040	0.0501		53.3560
Total	**7.9302**	**0.3328**	**28.8996**	**1.5300e-003**		**0.1603**	**0.1603**		**0.1603**	**0.1603**	**0.0000**	**52.1040**	**52.1040**	**0.0501**	**0.0000**	**53.3560**

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	0.5713					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	6.4880					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Hearth	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.8709	0.3328	28.8996	1.5300e-003		0.1603	0.1603		0.1603	0.1603		52.1040	52.1040	0.0501		53.3560
Total	**7.9302**	**0.3328**	**28.8996**	**1.5300e-003**		**0.1603**	**0.1603**		**0.1603**	**0.1603**	**0.0000**	**52.1040**	**52.1040**	**0.0501**	**0.0000**	**53.3560**

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	
Annual Emissions (tons/year)	0.0101
Daily Emissions (lbs/day)	0.055342466
Construction Duration (days)	31
Total DPM (lbs)	1.715616438
Total DPM (g)	778.2036164
Start Date	12/1/2022
End Date	1/1/2023
Construction Days	31
2023	
Annual Emissions (tons/year)	0.1045
Daily Emissions (lbs/day)	0.57260274
Construction Duration (days)	365
Total DPM (lbs)	209
Total DPM (g)	94802.4
Start Date	1/1/2023
End Date	1/1/2024
Construction Days	365
2024	
Annual Emissions (tons/year)	0.0938
Daily Emissions (lbs/day)	0.513972603
Construction Duration (days)	366
Total DPM (lbs)	188.1139726
Total DPM (g)	85328.49797
Start Date	1/1/2024
End Date	1/1/2025
Construction Days	366
2025	
Annual Emissions (tons/year)	0.00399
Daily Emissions (lbs/day)	0.021863014
Construction Duration (days)	65
Total DPM (lbs)	1.42109589
Total DPM (g)	644.6090959
Start Date	1/1/2025
End Date	3/7/2025
Construction Days	65

Total	
Total DPM (lbs)	398.829589
Total DPM (g)	180909.1016
Emission Rate (g/s)	0.002531869
Release Height (meters)	3
Total Acreage	4.78
Max Horizontal (meters)	196.69
Min Horizontal (meters)	98.35
Initial Vertical Dimension (meters)	1.5
Setting	Urban
Population	3,898,747
Start Date	12/1/2022
End Date	3/7/2025
Total Construction Days	827
Total Years of Construction	2.27
Total Years of Operation	27.73

Operation

Emission Rate	
Net Annual Emissions (tons/year)	0.04794
Daily Emissions (lbs/day)	0.262684932
Total DPM (lbs)	95.88
Emission Rate (g/s)	0.001379096
Release Height (meters)	3
Total Acreage	4.78
Max Horizontal (meters)	196.69
Min Horizontal (meters)	98.35
Initial Vertical Dimension (meters)	1.5
Setting	Urban
Population	3,898,747

```
Start date and time  05/02/22 16:22:10

                             AERSCREEN 21112


Northridge Fashion Center Construction


            Northridge Fashion Center Construction



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

                        METRIC              ENGLISH

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


 Emission Rate:    0.253E-02 g/s         0.201E-01 lb/hr

 Area Height:            3.00 meters           9.84 feet

 Area Source Length:  196.69 meters         645.31 feet

 Area Source Width:    98.35 meters         322.67 feet

 Vertical Dimension:    1.50 meters           4.92 feet

 Model Mode:           URBAN

 Population:         3898747

 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:

2022.05.02_NorthridgeFashionCenter_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 05/02/22 16:23:39
 ********************************************


  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 05/02/22 16:23:50


REFINE       started 05/02/22 16:23:50


 AERMOD Finishes Successfully for REFINE stage 3 Winter sector   0


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

*** NONE ***

REFINE ended 05/02/22 16:23:51

****

AERSCREEN Finished Successfully

With no errors or warnings

Check log file for details

****

Ending date and time 05/02/22 16:23:59

```
  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
   0.29932E+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
   0.32419E+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
   0.34937E+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
   0.36734E+01        75.00      0.00   0.0        Winter       0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
*  0.38153E+01       100.00      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
   0.25684E+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
   0.18217E+01       150.00      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
   0.14500E+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
   0.11940E+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
   0.10080E+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
   0.86790E+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
   0.75877E+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
   0.67135E+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
   0.60036E+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
   0.54163E+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
   0.49240E+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
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 310.0    2.0
   0.44998E+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
   0.41375E+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
   0.38249E+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
   0.35517E+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
   0.33092E+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
   0.30939E+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
   0.29018E+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
   0.27300E+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
   0.25756E+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
   0.24358E+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
   0.23076E+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
   0.21908E+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
   0.20841E+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
   0.19862E+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
   0.18962E+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
   0.18131E+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
   0.17362E+00       800.00      0.00   0.0        Winter       0-360   10011001
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-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.16646E+00       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
   0.15979E+00       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
   0.15359E+00       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
   0.14779E+00       900.00      0.00   0.0         Winter      0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.14235E+00       925.00      0.00   0.0         Winter      0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.13723E+00       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
   0.13242E+00       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
   0.12791E+00      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
   0.12366E+00      1025.00      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
   0.11965E+00      1050.00      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
   0.11586E+00      1075.00      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
   0.11227E+00      1100.00      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
   0.10887E+00      1125.00      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
   0.10565E+00      1150.00      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
   0.10260E+00      1175.00      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
   0.99693E-01      1200.00      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
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   0.96928E-01      1225.00      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
   0.94292E-01      1250.00      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
   0.91778E-01      1275.00      0.00   0.0         Winter       0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.89382E-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
   0.87094E-01      1325.00      0.00   0.0         Winter       0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.84906E-01      1350.00      0.00   0.0         Winter       0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.82813E-01      1375.00      0.00   0.0         Winter       0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.80808E-01      1400.00      0.00   0.0         Winter       0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.78887E-01      1425.00      0.00   0.0         Winter       0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.77045E-01      1450.00      0.00   0.0         Winter       0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.75272E-01      1475.00      0.00   0.0         Winter       0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.73565E-01      1500.00      0.00   0.0         Winter       0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.71923E-01      1525.00      0.00   0.0         Winter       0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.70345E-01      1550.00      0.00   0.0         Winter       0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.68826E-01      1575.00      0.00   0.0         Winter       0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.67355E-01      1600.00      0.00   0.0         Winter       0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.65937E-01      1625.00      0.00   0.0         Winter       0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
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 310.0    2.0
   0.64570E-01      1650.00      0.00   0.0        Winter       0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.63252E-01      1675.00      0.00   0.0        Winter       0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.61979E-01      1700.00      0.00   0.0        Winter       0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.60751E-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
   0.59564E-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
   0.58416E-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
   0.57307E-01      1800.00      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
   0.56462E-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
   0.55419E-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
   0.54409E-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
   0.53430E-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
   0.52481E-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
   0.51562E-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
   0.50669E-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
   0.49804E-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
   0.48963E-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
   0.48147E-01      2050.00      0.00   0.0        Winter       0-360   10011001
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-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.47354E-01      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
   0.46584E-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
   0.45835E-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
   0.45106E-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
   0.44398E-01      2175.00      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
   0.43708E-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
   0.43038E-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
   0.42384E-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
   0.41748E-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
   0.41128E-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
   0.40524E-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
   0.39935E-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
   0.39361E-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
   0.38801E-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
   0.38255E-01      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
   0.37722E-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
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  0.37201E-01      2475.00      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
  0.36692E-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
  0.36196E-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
  0.35711E-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
  0.35237E-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
  0.34773E-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
  0.34321E-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
  0.33878E-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
  0.33445E-01      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
  0.33022E-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
  0.32608E-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
  0.32203E-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
  0.31806E-01      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
  0.31418E-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
  0.31038E-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
  0.30666E-01      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
  0.30301E-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
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 310.0    2.0
   0.29944E-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
   0.29594E-01      2925.00      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
   0.29252E-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
   0.28916E-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
   0.28586E-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
   0.28263E-01      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
   0.27947E-01      3050.00      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
   0.27636E-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
   0.27331E-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
   0.27033E-01      3125.00      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
   0.26739E-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
   0.26451E-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
   0.26169E-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
   0.25892E-01      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
   0.25619E-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
   0.25352E-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
   0.25090E-01      3300.00      0.00   5.0        Winter       0-360   10011001
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-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.24832E-01      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
   0.24578E-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
   0.24330E-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
   0.24085E-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
   0.23845E-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
   0.23609E-01      3450.00      0.00   0.0         Winter       0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.23376E-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
   0.23148E-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
   0.22924E-01      3525.00      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
   0.22703E-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
   0.22486E-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
   0.22273E-01      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
   0.22063E-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
   0.21856E-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
   0.21653E-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
   0.21453E-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
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   0.21256E-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
   0.21062E-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
   0.20872E-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
   0.20684E-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
   0.20499E-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
   0.20317E-01      3850.00      0.00   0.0        Winter       0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.      6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.20138E-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
   0.19962E-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
   0.19788E-01      3925.00      0.00   0.0        Winter       0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.      6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.19617E-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
   0.19448E-01      3975.00      0.00   0.0        Winter       0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.      6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.19282E-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
   0.19118E-01      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
   0.18957E-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
   0.18798E-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
   0.18641E-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
   0.18487E-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
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 310.0    2.0
   0.18335E-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
   0.18185E-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
   0.18037E-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
   0.17891E-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
   0.17747E-01      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
   0.17605E-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
   0.17465E-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
   0.17327E-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
   0.17191E-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
   0.17057E-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
   0.16925E-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
   0.16794E-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
   0.16665E-01      4450.00      0.00   0.0        Winter       0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.16538E-01      4475.00      0.00   0.0        Winter       0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.16412E-01      4500.00      0.00   0.0        Winter       0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.16288E-01      4525.00      0.00   0.0        Winter       0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.16166E-01      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
   0.16045E-01      4575.00      0.00   0.0        Winter      0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.15926E-01      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
   0.15808E-01      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
   0.15692E-01      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
   0.15577E-01      4675.00      0.00   0.0        Winter      0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.15464E-01      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
   0.15352E-01      4725.00      0.00   0.0        Winter      0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.15242E-01      4750.00      0.00   0.0        Winter      0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.15133E-01      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
   0.15025E-01      4800.00      0.00   0.0        Winter      0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.14919E-01      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
   0.14814E-01      4850.00      0.00   0.0        Winter      0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.14710E-01      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
   0.14607E-01      4900.00      0.00   0.0        Winter      0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.14506E-01      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
   0.14406E-01      4950.00      0.00   0.0        Winter      0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
```

```
   0.14307E-01      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
   0.14209E-01      5000.00      0.00   0.0        Winter       0-360   10011001
-1.30  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 05/02/22 16:24:42

AERSCREEN 21112

Northridge Fashion Center Operation

Northridge Fashion Center Operation

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

	METRIC	ENGLISH
** AREADATA **	---------------	----------------
Emission Rate:	0.138E-02 g/s	0.109E-01 lb/hr
Area Height:	3.00 meters	9.84 feet
Area Source Length:	196.69 meters	645.31 feet
Area Source Width:	98.35 meters	322.67 feet
Vertical Dimension:	1.50 meters	4.92 feet
Model Mode:	URBAN	
Population:	3898747	
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:

2022.05.02_NorthridgeFashionCenter_Operation.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 05/02/22 16:26:19

 ****

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 05/02/22 16:26:29


REFINE       started 05/02/22 16:26:29


 AERMOD Finishes Successfully for REFINE stage 3 Winter sector   0


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

*** NONE ***

REFINE ended 05/02/22 16:26:31

****

AERSCREEN Finished Successfully

With no errors or warnings

Check log file for details

****

Ending date and time 05/02/22 16:26:33

```
 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
   0.16301E+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
   0.17656E+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
   0.19027E+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
   0.20006E+01        75.00      0.00   0.0        Winter       0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
*  0.20779E+01       100.00      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
   0.13988E+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
   0.99213E+00       150.00      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
   0.78969E+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
   0.65029E+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
   0.54900E+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
   0.47267E+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
   0.41324E+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
   0.36563E+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
   0.32697E+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
   0.29498E+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
   0.26817E+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
   0.24506E+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
   0.22534E+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
   0.20831E+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
   0.19343E+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
   0.18022E+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
   0.16850E+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
   0.15804E+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
   0.14868E+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
   0.14027E+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
   0.13266E+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
   0.12567E+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
   0.11931E+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
   0.11350E+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
   0.10817E+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
   0.10327E+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
   0.98745E-01       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
   0.94557E-01       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
   0.90654E-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
   0.87026E-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
   0.83646E-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
   0.80490E-01       900.00      0.00   0.0        Winter      0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.77524E-01       925.00      0.00   0.0        Winter      0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.74737E-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
   0.72120E-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
   0.69660E-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
   0.67346E-01      1025.00      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
   0.65161E-01      1050.00      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
   0.63097E-01      1075.00      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
   0.61145E-01      1100.00      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
   0.59295E-01      1125.00      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
   0.57541E-01      1150.00      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
   0.55876E-01      1175.00      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
   0.54294E-01      1200.00      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
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   0.52788E-01      1225.00      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
   0.51353E-01      1250.00      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
   0.49983E-01      1275.00      0.00   0.0        Winter       0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.      6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.48679E-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
   0.47432E-01      1325.00      0.00   0.0        Winter       0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.      6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.46241E-01      1350.00      0.00   0.0        Winter       0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.      6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.45101E-01      1375.00      0.00   0.0        Winter       0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.      6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.44009E-01      1400.00      0.00   0.0        Winter       0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.      6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.42963E-01      1425.00      0.00   0.0        Winter       0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.      6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.41960E-01      1450.00      0.00   0.0        Winter       0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.      6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.40994E-01      1475.00      0.00   0.0        Winter       0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.      6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.40064E-01      1500.00      0.00   0.0        Winter       0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.      6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.39170E-01      1525.00      0.00   0.0        Winter       0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.      6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.38311E-01      1550.00      0.00   0.0        Winter       0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.      6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.37484E-01      1575.00      0.00   0.0        Winter       0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.      6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.36683E-01      1600.00      0.00   0.0        Winter       0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.      6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.35910E-01      1625.00      0.00   0.0        Winter       0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.      6.0 1.000   1.50   0.35    0.50   10.0
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 310.0    2.0
   0.35166E-01      1650.00      0.00   0.0        Winter       0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.34448E-01      1675.00      0.00   0.0        Winter       0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.33755E-01      1700.00      0.00   0.0        Winter       0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.33086E-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
   0.32439E-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
   0.31814E-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
   0.31210E-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
   0.30750E-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
   0.30182E-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
   0.29632E-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
   0.29099E-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
   0.28582E-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
   0.28081E-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
   0.27595E-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
   0.27124E-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
   0.26666E-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
   0.26222E-01      2050.00      0.00   0.0        Winter       0-360   10011001
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-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.25790E-01      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
   0.25370E-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
   0.24962E-01      2125.00      0.00   0.0         Winter       0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.24565E-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
   0.24180E-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
   0.23804E-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
   0.23439E-01      2225.00      0.00   0.0         Winter       0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.23083E-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
   0.22736E-01      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
   0.22399E-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
   0.22070E-01      2325.00      0.00   0.0         Winter       0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.21749E-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
   0.21437E-01      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
   0.21132E-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
   0.20834E-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
   0.20544E-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
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   0.20260E-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
   0.19983E-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
   0.19713E-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
   0.19449E-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
   0.19190E-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
   0.18938E-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
   0.18692E-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
   0.18451E-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
   0.18215E-01      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
   0.17984E-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
   0.17759E-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
   0.17538E-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
   0.17322E-01      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
   0.17111E-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
   0.16904E-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
   0.16701E-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
   0.16502E-01      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
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 310.0    2.0
   0.16308E-01      2900.00      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
   0.16118E-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
   0.15931E-01      2950.00      0.00   0.0        Winter       0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.15748E-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
   0.15568E-01      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
   0.15392E-01      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
   0.15220E-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
   0.15051E-01      3074.99      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
   0.14885E-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
   0.14722E-01      3125.00      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
   0.14563E-01      3150.00      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
   0.14406E-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
   0.14252E-01      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
   0.14101E-01      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
   0.13953E-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
   0.13807E-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
   0.13664E-01      3300.00      0.00   0.0        Winter       0-360   10011001
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-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.13524E-01      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
   0.13386E-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
   0.13250E-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
   0.13117E-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
   0.12986E-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
   0.12858E-01      3450.00      0.00   0.0        Winter      0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.12731E-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
   0.12607E-01      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
   0.12485E-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
   0.12364E-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
   0.12246E-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
   0.12130E-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
   0.12016E-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
   0.11903E-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
   0.11792E-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
   0.11684E-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
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   0.11576E-01      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
   0.11471E-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
   0.11367E-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
   0.11265E-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
   0.11164E-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
   0.11065E-01      3850.00      0.00   0.0        Winter       0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.      6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.10968E-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
   0.10871E-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
   0.10777E-01      3925.00      0.00   0.0        Winter       0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.      6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.10684E-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
   0.10592E-01      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
   0.10501E-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
   0.10412E-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
   0.10324E-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
   0.10238E-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
   0.10152E-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
   0.10068E-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
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 310.0    2.0
   0.99854E-02      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
   0.99036E-02      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
   0.98231E-02      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
   0.97436E-02      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
   0.96653E-02      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
   0.95880E-02      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
   0.95118E-02      4300.00      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
   0.94367E-02      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
   0.93626E-02      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
   0.92895E-02      4375.00      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
   0.92173E-02      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
   0.91461E-02      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
   0.90759E-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
   0.90066E-02      4475.00      0.00   0.0        Winter       0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.      6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.89382E-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
   0.88707E-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
   0.88041E-02      4550.00      0.00   0.0        Winter       0-360   10011001
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-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.87383E-02      4575.00      0.00   0.0        Winter       0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.86734E-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
   0.86093E-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
   0.85461E-02      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
   0.84836E-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
   0.84220E-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
   0.83610E-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
   0.83009E-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
   0.82415E-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
   0.81828E-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
   0.81249E-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
   0.80676E-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
   0.80111E-02      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
   0.79552E-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
   0.79000E-02      4925.00      0.00   0.0        Winter       0-360   10011001
-1.30  0.043 -9.000  0.020 -999.   21.       6.0 1.000   1.50   0.35    0.50   10.0
 310.0    2.0
   0.78455E-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
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   0.77916E-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
   0.77384E-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
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SWAPE Technical Consultation, Data Analysis and Litigation Support for the Environment

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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

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Paul Rosenfeld, Ph.D.

Chemical Fate and Transport & Air Dispersion Modeling

Principal Environmental Chemist

Risk Assessment & Remediation Specialist

Education

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

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

B.A. Environmental Studies, U.C. Santa Barbara, 1991. 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