Exhibit 9

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Via E-mail

May 18, 2022

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Re: Appeal Comment on the Mitigated Negative Declaration, PPRP 2004082 (901-919 South Brand Boulevard)
May 18, 2022 Planning Commission, Agenda Item 7.a.

Dear Chairperson Lee and Honorable Members of the Planning Commission:

I am writing on behalf of the Supporters Alliance for Environmental Responsibility ("SAFER"), a California nonprofit public benefit corporation, regarding the Initial Study and Mitigated Negative Declaration ("MND") prepared for the Project known as PPRP 2004082, located at 901-919 South Brand Boulevard in the City of Glendale ("Project").

On September 7, 2021, SAFER submitted comments opposing the MND to the planning hearing officer, and on December 22, 2021, the hearing officer approved the MND and the Project. SAFER timely appealed that decision, and upon review of the City's response to comments, SAFER maintains its comments from September 7th. The IS/MND fails to analyze all environmental impacts and implement all necessary mitigation measures.

This comment has been prepared with the assistance of acoustics, noise and vibration expert Deborah Jue of the consulting firm Wilson Ihrig. Ms. Jue's comments and resume are attached hereto as Exhibit A. We incorporate Ms. Jue's comments herein by reference. As explained below and in the expert comments, there is a fair argument that the proposed Project may have significant adverse environmental impacts, and an EIR is therefore required.

I. LEGAL STANDARD

As the California Supreme Court has held, "[i]f no EIR has been prepared for a nonexempt project, but substantial evidence in the record supports a fair argument that the project may result

in significant adverse impacts, the proper remedy is to order preparation of an EIR." *Communities for a Better Env't v. South Coast Air Quality Mgmt. Dist.* (2010) 48 Cal.4th 310, 319-320 (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.

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 v. City of Sacramento* (2004) 124 Cal.App.4th 903, 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 making administrative determinations. Ordinarily, public agencies weigh the evidence in the record before them and reach a decision based on a preponderance of the evidence. [Citations]. 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. The lead agency's decision is thus largely legal rather than factual; it does not resolve conflicts in the evidence but determines only whether substantial evidence exists in the record to support the prescribed fair argument.

Kostka & Zischke*, Practice Under CEQA*, §6.29, pp. 273-274. The Courts have explained that "it is a question of law, not fact, whether a fair argument exists, and the courts owe no deference to the lead agency's determination. Review is de novo, with *a preference for resolving doubts in favor of environmental review*." *Pocket Protectors*, 124 Cal.App.4th at 928 (emphasis in original).

II. DISCUSSION

a. There is Substantial Evidence of a Fair Argument that the Project May Have a Significant Health Impact as a Result of Diesel Particulate Emissions.

In SAFER's September 7th letter, expert environmental consulting firm Soil Water Air Protection Enterprise ("SWAPE") commented on the potential health risk impacts that could be caused by the Project. SAFER comment letter, Sept. 7, 2021, Ex. A, p. 5-10. SWAPE's comment noted that exposure to Diesel Particulate Matter ("DPM") is a health hazard that could occur during construction and operation of the Project. SWAPE found that by not preparing a Health Risk Assessment ("HRA") for the Project, the Project's MND was inadequate in its assessment of health risks.

In its December 22nd decision letter and response to comments ("RTC"), the City stated that according to California Air Pollution Control Officers Association ("CAPCOA") guidance, an HRA is only required for two types of projects, neither of which encompasses the proposed Project. RTC, p. 3. SAFER rejects this response.

Substantial evidence of a fair argument of a health risk impact from the Project still exists, because the City has provided no evidence to rebut SWAPE's findings. In its comment for the September 7th letter, SWAPE prepared a screening-level HRA to evaluate the Project's potential construction-related and operational Toxic Air Contaminant ("TAC") emissions. SAFER comment letter, Sept. 7, 2021, Ex. A, p. 6. SWAPE found that cancer risks over the course of Project construction and operation exceeded the SCAQMD threshold of 10 in one million for children, infants, and lifetime risks. *Id.* at 9. In its RTC, the City did not provide evidence to rebut this finding – they merely stated that an HRA was not required. Whether or not an HRA is required is irrelevant. What matters is that SWAPE conducted an HRA and found that the Project may have a significant impact on human health. An EIR therefore must be prepared to appropriately evaluate these impacts.

b. There is Substantial Evidence of a Fair Argument that the Project May Have Adverse Noise Impacts that the MND Failed to Address.

i. The MND's baseline noise levels and thresholds of significance are not properly established.

Courts have repeatedly held that where an EIR contains an "inadequate description of the environmental setting for the project, a proper analysis of project impacts [i]s impossible." *Galante Vineyards v. Monterey Peninsula Water Management Dist.* (1997) 60 Cal.App.4th 1109, 1122 [invalidating EIR with only passing references to surrounding viticulture]; *Friends of the Eel River v. Sonoma County Water Agency* (2003) 108 Cal.App.4th 859, 873-75. Relying on a skewed baseline "mislead(s) the public" and "draws a red herring across the path of public input." *San Joaquin Raptor Rescue Center v. County of Merced* (2007) 149 Cal.App.4th 645, 656; *Woodward Park Homeowners v. City of Fresno* (2007) 150 Cal.App.4th 683, 708-711.

CEQA does not provide a particular numeric threshold of significance for the evaluation of noise impacts. *King & Gardiner Farms, LLC v. County of Kern* (2020) 45 Cal. App. 5th 814, 884. CEQA Guidelines recommend that agencies compare a project's noise impacts to standards set forth in a local general plan or noise ordinance, or other applicable noise standards. CEQA Guidelines Appendix G, XII, Noise. It is therefore "the responsibility of lead agencies to choose the thresholds of significance to be applied to a project's noise impacts." *King & Gardiner* at 884.

The MND lacks any discussion of the thresholds used to determine significance. Ex. A, p. 1. Although the MND's Noise section refers to the City of Glendale's Noise Element and Noise Ordinance, it does not give information on the thresholds that would actually establish whether noise and vibration impacts would be significant. *Id.* at 2. Ms. Jue gives examples of thresholds from the Noise Element and Noise Ordinance which could be used to evaluate potentially significant impacts:

(1) Speech Interference: Intelligibility of speech could be impacted for people in offices or working from home near the Project site. *Id.* The Noise Element states that noise from 60 to 65 dBA or greater may interfere with speech. Ms. Jue notes that this is up to 10 dBA greater than Glendale's interior noise standards, which limit interior noise to 55 dBA. *Id.*; Glendale Municipal Code ("GMC") § 8.36.040.B. The Noise Element's speech interference threshold equates to 75 to 80 dBA outdoors for buildings with open windows, which is up to 20 dBA greater than Glendale exterior noise standards. Ex. A at 2; GMC § 8.36.040.A. Ms. Jue states that "the duration of the project noise (construction) could be considered in combination with these metrics to determine significance." *Id.*

(2) Construction Noise and Vibration: Ms. Jue found that the effects of construction noise and vibration were minimized by the MND. Ex. A at 2. The MND characterizes these impacts as "limited" and "temporary" and, according to Ms. Jue, relies on the Noise Ordinance's limited hours for construction to conclude that impacts would be less than significant. *Id.* The MND fails to provide any metrics to evaluate the increase in ambient noise levels to determine the significance of construction noise, or to evaluate the impacts of vibration from construction. *Id.* Ms. Jue gives Caltrans as an example of a threshold that could be used to determine the significance of vibration impacts from construction sources. *Id.*

The MND fails to establish particular thresholds of significance for noise impacts. Its conclusion that noise impacts for the Project would be less-than-significant is therefore unsubstantiated. The City should prepare an EIR which adequately describes the thresholds of significance for noise and demonstrates the Project's compliance with those thresholds.

ii. The MND's impact analyses of potential construction and vibration impacts are incomplete.

Ms. Jue next found that the MND failed to provide evidence that the on-going construction noise and vibration would be less than significant. Ex. A, p. 2-3. Ms. Jue states that "[w]ithout the benefit of the existing BMW building providing shielding of the construction noise, during demolition and site preparation, noise from a hoe ram, excavator, or dozer could generate noise as high as 87 to 92 dBA Lmax at the nearest residence (40 ft distance[]), with on-going noise over several hours each day ranging from 77 to 85 dBA Leq as equipment moves around." *Id.* at 3. Noise levels could be even higher if multiple items of equipment were to operate at the same time, which is not unlikely. *Id.* As for construction, Ms. Jue states that "the noise from a crane, front end loader or pneumatic tools would range from 82 to 87 dBA Lmax at the closest distance, with on-going noise levels of 72 to 84 dBA Leq." *Id.* Noise at these levels could exceed the City's Noise Element speech interference threshold and the City of Glendale's overall exterior noise standards. *Id.*; GMC § 8.36.040.A. Construction noise would therefore be potentially significant at nearby noise sensitive receptors.

As for vibration, Ms. Jue's calculations demonstrate that construction vibration could cause annoyance to occupants and could be potentially significant. Ex. A at 3. Specifically, ground

compaction with a vibratory roller, a tool that Caltrans data shows is typically used in this type of project, would be "strongly perceptible" if used 40 feet from the nearest residence, and distinctly perceptible at 80 feet. *Id.* The MND states that the Project site is located 40 feet away from adjacent residential uses. MND, p. 29. Although the MND states that noise impacts on residential uses would be buffered by the existing dealership's auto body and vehicle repair building, Ms. Jue points out that construction at higher levels of the garage would not be subject to this noise buffer. *Id.*; Ex. A at 3. Construction vibration would therefore cause a significant noise and vibration impact on sensitive receptors.

The only mention that the MND makes regarding compliance with standards is a statement that "[t]he Project is not anticipated to generate noise in excess of the limits contained in the Noise Element because the Project would be constructed to reduce interior noise to acceptable levels as required by the building code." MND, p. 29. This conclusory statement is unsupported by evidence and therefore cannot be relied upon. Ex. A at 4. The City has failed to address or mitigate significant noise and vibration impacts, and must prepare an EIR which properly analyzes these impacts.

iii. The MND's mitigation measures for noise and vibration impacts are lacking and further measures must be implemented.

Ms. Jue states that the following mitigation measures for construction noise should be implemented, and the City should provide evidence that the measures are sufficient to eliminate potentially significant impacts:

- Sound barrier or blankets that block line of sight from the noisiest construction equipment and activities to the noise sensitive neighbors.
- Buffer distances to keep noisy activities and stationary equipment away from noise sensitive neighbors.
- Notification is useful community outreach, but has no bearing on reducing noise.

Ex. A at 4. As for construction vibration impacts, Ms. Jue recommends the following:

- Buffer distances to keep vibratory roller/compaction activities away from noise sensitive neighbors.
- Alternate methods to achieve necessary soil substrate properties to support the project within the buffer distances.
- Notification is useful community outreach, but has no bearing on reducing noise.

Ex. A. at 4-5. The City should therefore prepare an EIR which properly analyzes construction and vibration noise, comparing impacts to relevant thresholds of significance. Based on the City's findings, it should then implement appropriate mitigation measures to reduce impacts to less than significant.

III. CONCLUSION

In light of the above comments, the City must prepare an EIR for the Project and the draft EIR should be circulated for public review and comment in accordance with CEQA. Thank you for considering these comments.

Sincerely,

Amalia Bowley Fuentes
LOZEAU DRURY LLP

EXHIBIT A

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May 16, 2022

Ms. Amalia Bowley Fuentes
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SUBJECT: 901–919 South Brand Boulevard (Pacific BMW Dealership Expansion) Negative Declaration, Comments on the Noise Analysis

Dear Ms. Bowley Fuentes,

Per your request, I have reviewed the subject matter document for the Pacific BMW Dealership Expansion Negative Declaration (ND) at 901–919 South Brand Boulevard in Glendale, California. The proposed Project would include demolishing existing surface parking lot and small accessory building and construct a new parking structure.

Thresholds of Significance are Not Properly Developed

The ND lacks any discussion of the thresholds used to determine significance. Per CEQA[1], the ND must clearly identify and mitigate eliminate **potentially** significant effects, as shown in Figure 1.

§ 15070. Decision to Prepare a Negative or Mitigated Negative Declaration.

A public agency shall prepare or have prepared a proposed negative declaration or mitigated negative declaration for a project subject to CEQA when:

(a) The initial study shows that there is no substantial evidence, in light of the whole record before the agency, that the project may have a significant effect on the environment, or

(b) The initial study identifies potentially significant effects, but:

(1) Revisions in the project plans or proposals made by or agreed to by the applicant before a proposed mitigated negative declaration and initial study are released for public review would avoid the effects or mitigate the effects to a point where clearly no significant effects would occur, and

(2) There is no substantial evidence, in light of the whole record before the agency, that the project as revised may have a significant effect on the environment.

Figure 1 CEQA Section 15070 (a) and (b)

[1] https://govt.westlaw.com/calregs/Document/IA1DEFD80D48811DEBC02831C6D6C108E?

The ND discusses the City's Noise Element and the Noise Ordinance, but provides no specific thresholds to establish whether any of the project noise or vibration sources would be significant. Thus, thresholds that could be considered to evaluate potentially significant noise impacts include:

Speech Interference

For intelligibility of speech, which could be substantially impacted for people in nearby offices or working from home, the Noise Element identifies that noise in the range of 60 to 65 dBA or greater may interfere with speech. This is up to 10 dBA greater than the Glendale interior noise standards (8.36.040.B) which limits noise at the interior of residences to 55 dBA.

To evaluate the effect noise at the interior of neighboring buildings, this Noise Element speech interference threshold would equate to a range of 75 to 80 dBA outdoors for building with open windows. This is up to 20 dBA greater than the Glendale exterior noise standards (8.36.040.A) which limits noise at the exterior of residences to 60 dBA. The duration of the project noise (construction) could be considered in combination with these metrics to determine significance. For instance, construction activities which would exceed one week duration could be subject to the lower thresholds.

Construction Noise and Vibration

The effect of construction noise and vibration has been minimized in the ND discussion. The ND characterizes construction as "temporary" or "limited" and appears to rely on the limited hours for construction in the Noise Ordinance to conclude that noise and vibration would not be significant. The ND provides no metrics to evaluate the increase in ambient noise levels to determine the significance of construction noise. Daytime construction could interfere with daytime activities, such as interfering with speech during conversations and phone calls.

The ND provides no metrics to evaluate the vibration from construction. Caltrans provides guidance to evaluate the effects of vibration from construction sources[2]. Construction activities which generate vibration on the order of 0.04 in/sec PPV for continuous or frequent intermittent sources such as vibratory compaction and 0.25 in/sec PPV for transient sources such as trucks are "distinctly perceptible" and could be potentially significant. Vibration from a vibratory roller that exceeds 0.10 in/sec PPV would be "strongly perceptible" and significant.

Impact Analyses are Incomplete

Construction Noise

Information from Caltrans[3] and other sources can be used to estimate noise from construction. Demolition of existing buildings, excavation, foundations, concrete and building erection will all require several months of activity. Even if this work would only be conducted during daytime hours, the interference on daytime activities such as talking on the phone, conducting meetings, etc. at nearby offices and residences could be potentially significant. The ND provides no evidence that the

[2] https://dot.ca.gov/-/media/dot-media/programs/environmental-analysis/documents/env/tcvgm-apr2020-a11y.pdf
[3] https://dot.ca.gov/-/media/dot-media/programs/environmental-analysis/documents/env/tens-sep2013-a11y.pdf

on-going construction noise and vibration would be less than significant. Table 1 provides sample noise calculations from five different types of construction equipment, some of which could combine.

Without the benefit of the existing BMW building providing shielding of the construction noise, during demolition and site preparation, noise from a hoe ram, excavator, or dozer could generate noise as high as 87 to 92 dBA Lmax at the nearest residence (40 ft distance[4]), with on-going noise over several hours each day ranging from 77 to 85 dBA Leq as equipment moves around. If several activities and/or equipment would be operating at the same time, the noise would be even higher. During building construction, the noise from a crane, front end loader or pneumatic tools would range from 82 to 87 dBA Lmax at the closest distance, with on-going noise levels of 72 to 84 dBA Leq. Based on the Noise Element guidance, these exterior noise levels that exceed 75 dBA could cause speech interference at interior locations. Taking into account longer duration activities, as discussed above, on-going construction activities lasting more than a week would be significant above 60 dBA.

Depending on the height of the construction, the intervening building could provide 10 to 15 dBA noise reduction, but construction at the higher levels of the garage would not receive 0 to 5 dBA noise reduction. Based on these calculations, construction noise would be potentially significant at nearby noise sensitive receptors.

Table 1 Sample Calculations from Construction Noise – Shielding from Intervening Building Ignored

Equipment	Reference Level at 50 ft (dBA)	Usage Factor (%)	Distance to Nearest Residence (ft)		Intermittent Level (dBA Lmax)		On-going Level (dBA Leq)	
			Near distance	Further distance	Near distance	Further distance	Near distance	Further distance
Mounted Impact Hammer Hoe Ram	90	20	40	80	92	86	85	79
Excavator or Dozer	85	40	40	80	87	81	83	77
Crane	85	16	40	80	87	81	79	73
Front end loader	80	40	40	80	82	76	78	72
Pneumatic Tools	85	50	40	80	87	81	84	78

Construction Vibration

Information from Caltrans (2020) can be used to estimate vibration from construction. Demolition of existing buildings, excavation, and site preparation will require several months of activity. The construction vibration could cause annoyance to occupants in nearby offices and residences and could be potentially significant. Table 2 provides sample vibration calculations from six different types of construction equipment. Ground compaction with a vibratory roller would be "strongly perceptible" near 40 ft from the nearest residence, and still distinctly perceptible at distances on the order of 80 ft distance. Based on these calculations, construction vibration from a vibratory roller would be significant at nearby noise (and vibration) sensitive receptors.

[4] There is no site plan in the ND, but from the existing aerial photos, it has been inferred that the nearest residence is at 123 E. Acacia

Table 2 Sample Calculations from Construction Vibration

		Distance to Nearest Residence (ft)			
		Near distance	Further distance	Near distance	Further distance
	0.21	40	80	0.125	0.058
		40	80		0.025
		40	80		0.025
		40	80		0.021
		40	80		0.010
		40	80		0.001

Unclear ND Conclusion

On page 29, the ND includes a statement that cites compliance with the building code to achieve interior noise limits:

> from the adjacent residential uses and buffered by the dealership's auto body and vehicle repair building located in between the residential uses and the parking structure. Additionally, the parking structure will be used primarily for vehicle inventory, with limited customer parking on the ground floor only during normal operating hours. The Project is not anticipated to generate noise in excess of the limits contained in the Noise Element because the Project would be constructed to reduce interior noise to acceptable levels as required by the building code. Construction associated with the Project will be required to comply with the City of Glendale Noise Ordinance (GMC Chapter 8.36), which prohibits construction activities between the hours of 7:00 PM on one date and 7:00 AM of the next day or from 7:00 PM on Saturday to 7:00 AM on Monday or from 7:00 PM preceding a holiday. No significant impacts are anticipated.

This statement is not supported by evidence, and it seems to be a remnant from another project, as the interior noise within the new parking structure does not appear to be subject to any noise limits.

Noise and Vibration Mitigations are Lacking

To mitigate construction noise, mitigation measures should include, but are not limited to, the following, and the ND should include evidence that these measures would be sufficient to eliminate the (potentially) significant impacts below the thresholds of significance:

- Sound barrier or blankets that block line of sight from the noisiest construction equipment and activities to the noise sensitive neighbors.
- Buffer distances to keep noisy activities and stationary equipment away from noise sensitive neighbors.
- Notification is useful community outreach, but has no bearing on reducing noise.

To mitigate construction vibration, mitigation measures should include, but are not limited to, the following, and the ND should include evidence that these measures would be sufficient to eliminate the significant impacts below the thresholds of significance:

- Buffer distances to keep vibratory roller/compaction activities away from noise sensitive neighbors.

- Alternate methods to achieve necessary soil substrate properties to support the project within the buffer distances.
- Notification is useful community outreach, but has no bearing on reducing noise.

Conclusions

The ND lacks evidence to support its conclusions regarding construction noise and vibration. Thresholds of significance have been omitted from the document. The construction noise and vibration analyses in the ND also are not complete, and based on the analysis discussed above, mitigations are required.

Please feel free to contact me with any questions on this information.

Very truly yours,

WILSON IHRIG

Deborah A. Jue

Deborah A. Jue, INCE-USA
Principal

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WILSON IHRIG
ACOUSTICS, NOISE & VIBRATION

DEBORAH JUE

Principal

Since joining Wilson Ihrig in 1990, Ms. Jue has been involved in with many projects from environmental assessments and entitlements, through design development, construction documents and construction administration support. As an acoustical consultant, she has provided noise measurement, analysis and recommendations to control noise and vibration both at the interior of the project and at the neighboring properties. She has authored many reports concerning compliance with the requirements of California Noise Insulation Standards, Title 24, local Noise Elements, environmental assessments and Federal noise criteria, and is well aware of the additional design and construction technique requirements to achieve industry standards. Ms. Jue has authored or provided input for many environmental documents and technical studies in accordance with NEPA and California's CEQA regulations, most of them related to surface transportation, and she gives presentations to public officials when necessary to explain construction noise problems, noise mitigation goals, and noise control methods. She can develop construction noise and vibration criteria to address vibration damage potential to nearby buildings and sensitive structures, and vibration annoyance or disruption potential for occupants of nearby buildings.

Education

- M.S. in Mechanical Engineering, University of California, Berkeley, 1998
- B.S. in General Engineering: Acoustics, Stanford University, 1988

Professional Associations (Member)

- American Society of Mechanical Engineers
- Acoustical Society of America
- National Council of Acoustical Consultants
- Institute of Noise Control Engineering
- WTS
- Transportation Research Board, AEP80 Standing Committee Member (2021-2024)

Research and Published Papers

- ACRP Report 175, ACRP 07-14, *Improving Intelligibility of Airport Terminal Public Address Systems*
- NCHRP 25-25, *Current Practices to Address Construction Vibration and Potential Effects to Historic Buildings Adjacent to Transportation Projects*
- *Transportation Research Record*, V. 2502, "Considerations to Establish Ground-Borne Noise Criteria to Define Mitigation for Noise-Sensitive Spaces"

Relevant Experience

- California High Speed Rail Caltrain Corridor EIR/EIS, San Francisco to San Jose
- UC Berkeley Northgate Hall A/V Renovations, Berkeley
- MacArthur Station, *long-term construction noise and vibration monitoring*, Oakland
- Safeway @ Claremont & College, *HVAC noise and construction noise monitoring*, Oakland
- ACTC I-80/Ashby, *interchange traffic noise analysis*, Berkeley and Emeryville
- ACTC I-680 Express Lanes, *traffic noise analysis*, Contra Costa County, CA
- Chase Arena, *construction noise and vibration monitoring*, San Francisco

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September 7, 2021

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Re: Comment on the Mitigated Negative Declaration, PPRP 2004082 (901-919 South Brand Boulevard)

Dear Ms. Ezzati:

I am writing on behalf of the Supporters Alliance for Environmental Responsibility ("SAFER"), a California nonprofit public benefit corporation, regarding the Initial Study and Mitigated Negative Declaration ("MND") prepared for the Project known as PPRP 2004082, located at 901-919 South Brand Boulevard in the City of Glendale ("Project").

After reviewing the IS/MND, we conclude that it fails to analyze all environmental impacts and implement all necessary mitigation measures, and that there is a fair argument that the Project may have adverse environmental impacts. SAFER respectfully requests that the City withdraw the IS/MND and instead prepare an environmental impact report ("EIR") for the Project.

These comments have been prepared with the assistance of environmental consulting firm Soil/Water/Air Protection Enterprise ("SWAPE"). SWAPE's comment and curriculum vitae are attached as Exhibit A hereto and are incorporated herein by reference in their entirety.

I. PROJECT DESCRIPTION

The Project proposes to construct a new 5-story, 171,140 square foot above-ground parking structure with rooftop parking, featuring 450 parking spaces in total, on an existing 81,148 square-foot project site. This will require the demolition of the existing surface parking lot, an existing 561 square foot accessory building, and existing solar panel structures which will be moved to the rooftop of the new structure. The structure is proposed for use as vehicle inventory for the Pacific BMW Car Dealership, for which the applicant is requesting a parking reduction permit.

II. LEGAL STANDARD

As the California Supreme Court has held, "[i]f no EIR has been prepared for a nonexempt project, but substantial evidence in the record supports a fair argument that the project may result in significant adverse impacts, the proper remedy is to order preparation of an EIR." *Communities for a Better Env't v. South Coast Air Quality Mgmt. Dist.* (2010) 48 Cal.4th 310, 319-320 (*CBE v. SCAQMD*) (citing *No Oil, Inc. v. City of Los Angeles* (1974) 13 Cal.3d 68, 75, 88; *Brentwood Assn. for No Drilling, Inc. v. City of Los Angeles* (1982) 134 Cal.App.3d 491, 504–505). "Significant environmental effect" is defined very broadly as "a substantial or potentially substantial adverse change in the environment." Pub. Res. Code ("PRC") § 21068; *see also* 14 CCR § 15382. An effect on the environment need not be "momentous" to meet the CEQA test for significance; it is enough that the impacts are "not trivial*." No Oil, Inc.*, 13 Cal.3d at 83. "The 'foremost principle' in interpreting CEQA is that the Legislature intended the act to be read so as to afford the fullest possible protection to the environment within the reasonable scope of the statutory language." *Communities for a Better Env't v. Cal. Res. Agency* (2002) 103 Cal.App.4th 98, 109 (*CBE v. CRA*).

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

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

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 and 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 making administrative determinations. Ordinarily, public agencies weigh the evidence in the record before them and reach a decision based on a preponderance of the evidence. [Citations]. 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. The lead agency's decision is thus largely legal rather than factual; it does not resolve conflicts in the evidence but determines only whether substantial evidence exists in the record to support the prescribed fair argument.

Kostka & Zischke*, Practice Under CEQA*, §6.29, pp. 273-274. The Courts have explained that "it is a question of law, not fact, whether a fair argument exists, and the courts owe no deference to the lead agency's determination. Review is de novo, with *a preference for resolving doubts in favor of environmental review*." *Pocket Protectors*, 124 Cal.App.4th at 928 (emphasis in original).

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

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

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

III. DISCUSSION

A. The IS/MND Failed to Prepare a Phase I Environmental Site Assessment to Estimate the Project Site's Hazardous Substances.

Matt Hagemann, P.G., C.Hg., and Dr. Paul E. Rosenfeld, Ph.D., of the environmental consulting firm SWAPE reviewed the MND's analysis of the Project's impacts on hazards, hazardous materials, air quality, and greenhouse gases. SWAPE comment letter and CVs are attached as Exhibit A.

The MND concluded that no impacts from hazards or hazardous materials would occur because the site is "not included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5." MND, p. 24. However, SWAPE notes that the MND did not provide documentation to support this conclusion, such as a Phase I Environmental Site Assessment ("ESA"). Ex. A, p. 1. The U.S. EPA and the American Society for Testing and Material Standards have both set standards for conducting Phase I ESAs, including reviewing known sites in the vicinity, interviewing people with knowledge about the property, and preparing recommendations for addressing potential hazards. *Id.* at 2. Phase I ESAs end with the identification of "recognized environmental conditions" (RECs), which include the "presence or likely presence of any hazardous substances or petroleum products on a property under conditions that indicate an existing release, a past release, or a material threat of a release" of such substances. *Id.* If any RECs are identified, there would then follow a Phase II ESA to further investigate the level of contamination and the mitigation necessary. *Id.*

SWAPE states that a Phase I ESA should be prepared for the project by a licensed environmental professional, and a Phase II ESA should follow if RECs are found on the project site. Ex. A, p. 2. An EIR is required in order to adequately prepare these assessments and evaluate any contamination on the site that is above regulatory screening levels, in accordance with the California Office of Environmental Health Hazard Assessment's Soil Screening Numbers, among other databases. *Id.*

B. The IS/MND Relied on Unsubstantiated Input Parameters to Estimate Project Emissions and Thus the Project May Result in Significant Air Quality Impacts.

SWAPE found that the MND underestimated the Project's construction and operational emissions and therefore cannot be relied upon to determine the significance of the Project's impacts on local and regional air quality. The MND relies on emissions calculated from the California Emissions Estimator Model Version CalEEMod.2016.4.0 ("CalEEMod"). Ex. A, p. 2. This model, which is used to generate a project's construction and operational emissions, relies on recommended default values based on site specific information related to a number of factors. *Id*. CEQA requires any changes to the default values to be justified by substantial evidence. *Id*.

SWAPE reviewed the MND's CalEEMod output files and found that the values input into the model were inconsistent with information provided in the MND. Ex. A, p. 3. This resulted in an underestimation of the Project's emissions. *Id*. As a result, the MND's air quality analysis cannot be relied upon to determine the Project's emissions.

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

1. Underestimated land use size of a structure. Ex. A, p. 3.
2. Unsubstantiated reduction to default acres of grading values. Ex. A, p. 4.
3. Failure to model all required demolition. Ex. A, p. 4.

As a result of these errors in the MND, the Project's construction and operational emissions are underestimated and cannot be relied upon to determine the significance of the Project's air quality impacts.

C. There is Substantial Evidence of a Fair Argument that the Project May Have a Significant Health Impact as a Result of Diesel Particulate Emissions.

One of the primary emissions of concern regarding health effects for land development projects is diesel particulate matter ("DPM"), which can be released during Project construction and operation. DPM consists of fine particles with a diameter less than 2.5 micrometers including a subgroup of ultrafine particles (with a diameter less than 0.1 micrometers). Diesel exhaust also contains a variety of harmful gases and cancer-causing substances. Exposure to DPM is a recognized health hazard, particularly to children whose lungs are still developing and the elderly who may have other serious health problems. According to the California Air Resources Board ("CARB"), DPM exposure may lead to the following adverse health effects: aggravated asthma; chronic bronchitis; increased respiratory and cardiovascular hospitalizations; decreased lung

function in children; lung cancer; and premature deaths for those with heart or lung disease.[1]

The MND failed to conduct a quantified construction or operational health risk analysis ("HRA") and made no mention of potential project-related toxic air contaminant ("TAC") emissions, resulting in an inadequate health risk emissions analysis. Ex. A, p. 5. SWAPE identifies three main reasons for why the MND's omission of these elements was incorrect.

First, the MND's failure to quantitively evaluate TAC emissions also meant that it failed to make a reasonable effort to connect the emissions to potential health risk impacts as required by CEQA. Ex. A, p. 5; *See Sierra Club v. County of Fresno* (2018) 6 Cal.5th 502, 510. In fact, according to CalEEMod Outputs, Project construction would increase DPM for a period of 350 days in addition to generating 653 weekday and Saturday and 326 Sunday daily vehicle trips. *Id.*; CalEEMod Outputs, pp. 5, 22. This would generate exhaust emissions and expose sensitive receptors to DPM emissions. *Id.* Despite the presence of these additional emissions, the MND did not connect construction-related and operational TAC to potential health risks posed to nearby receptors, and thus fails to meet the CEQA requirement to correlate the increase in emissions generated by the Project with the potential adverse impacts on human health. Ex. A, p. 5-6.

Second, the California Department of Justice recommends the preparation of a quantitative HRA pursuant to the Office of Environmental Health Hazard Assessment ("OEHHA"), the organization responsible for providing guidance on conducting HRAs in California, as well as local air district guidelines. OEHHA released its most recent guidance document in 2015 describing which types of projects warrant preparation of an HRA. Ex. A, p. 6; *See* "Risk Assessment Guidelines Guidance Manual for Preparation of Health Risk Assessments." OEHHA, February 2015, *available at*: http://oehha.ca.gov/air/hot_spots/hotspots2015.html. OEHHA recommends that projects lasting at least 2 months be evaluated for cancer risks to nearby sensitive receptors, a time period which this Project easily exceeds. Ex. A, p. 6.; MND, p. 11. The OEHHA document also recommends that if a project is expected to last over 6 months, the exposure should be evaluated throughout the project using a 30-year exposure duration to estimate individual cancer risks. Ex. A, p. 6. Based on its extensive experience, SWAPE reasonably assumes that the Project will last at least 30 years, and therefore recommends that health risk impacts from the project be evaluated. *Id.* An EIR is therefore required to analyze these impacts. *Id.*

Third, the MND's claim that there will be a less than significant impact without having conducted a qualified construction or operational HRA for nearby sensitive receptors fails under CEQA requirements. Ex. A, p. 6. An EIR should be prepared to quantify the cumulative excess cancer risk posed by the Project's construction and

[1] *See* CARB Resources - Overview: Diesel Exhaust & Health, available at https://ww2.arb.ca.gov/resources/overview-diesel-exhaust-and-health.).

operation to nearby, existing receptors, and compare it to the SCAQMD threshold of 10 in one million. *Id.*

SWAPE prepared a screening-level HRA to evaluate potential impacts from Project construction. SWAPE used AERSCREEN, the leading screening-level air quality dispersion model. SWAPE applied a sensitive receptor distance of 50 meters and analyzed impacts to individuals at different stages of life based on OEHHA and SCAQMD guidance utilizing age sensitivity factors. *Id*. at 6-10.

SWAPE found that the excess cancer risks at a sensitive receptor located approximately 50 meters away over the course of Project construction are approximately 46.7 in one million for infants and 16 in one million for children. *Id*. at 9. Moreover, **the excess lifetime cancer risk over the course of a Project operation of 30 years is approximately 68.6 in one million**. *Id*. The risks to infants, children, and lifetime residents appreciably exceed SCAQMD's threshold of 10 in one million.

SWAPE's analysis constitutes substantial evidence that the Project may have a significant health impact as a result of diesel particulate emissions. A health risk assessment must be prepared disclosing the health risk impacts from toxic air contaminants.

D. The IS/MND Failed to Adequately Evaluate Energy Impacts.

CEQA requires that EIRs include "a discussion of the potential energy impacts of proposed projects, with particular emphasis on avoiding or reducing inefficient, wasteful and unnecessary consumption of energy." "APPENDIX F: ENERGY CONSERVATION." CEQA Guidelines Appendices, 2016, available at: https://resources.ca.gov/CNRALegacyFiles/ceqa/docs/2016_CEQA_Statutes_and_Guidelines_Appendix_F.pdf , p. 276. This helps ensure that a project meets CEQA's goal of conserving energy, which requires decreasing energy consumption, decreasing reliance on fossil fuels, and increasing reliance on renewables. *Id.* However, in its energy analysis, the MND concludes that it will have a less-than-significant energy impact simply because it meets Title 24 standards and California Green Building Standards. MND, p. 17. It also states that it will implement sustainable design strategies and relocate existing solar panels to the Project's roof. *Id.*

SWAPE concludes that this compliance with Title 24 does not constitute an adequate analysis of energy, as held in *Ukiah Citizens First v. City of Ukiah* (2016) 248 Cal.App.4th 256. Ex. A, p. 11. There, the court ruled that a city's reliance on mitigation measures that aligned with Title 24 and other California green building codes did not meet CEQA Appendix F requirements. Ex. A, p. 11; *Ukiah Citizens First* at 264 (quoting *California Clean Energy Committee v. City of Woodland* (2014) 225 Cal.App.4th 173, 211). The Project's energy analysis is therefore insufficient and according to SWAPE, the MND's less-than-significant impact conclusion regarding energy impacts should not be relied upon. Ex. A, p. 11.

E. The IS/MND Failed to Adequately Analyze the Project's Greenhouse Gas Impacts and Thus the Project May Result in Significant Greenhouse Gas Emissions.

The MND states that the Project would generate energy from solar panels that would go into the City's electrical grid, thus helping the City meet its renewable energy portfolio as specified in the Greener Glendale Plan. MND, p. 22. It then concludes that because the Project is consistent with Greener Glendale Strategies to reduce greenhouse gases and the Sustainable Communities Strategy ("SCS") prepared by Southern California Association of Governments ("SCAG"), the Project would "result in a less than cumulatively considerable impact on GHG emissions." *Id.* However, SWAPE states that the MND's conclusion about a less-than-significant greenhouse gas impact is incorrect for several reasons. Ex. A, p. 11.

First, the MND does not give an estimate of the renewable energy the Project anticipates generating. Ex. A, p. 12. Without this information, SWAPE is unable to assess whether GHG impacts would be less-than-significant. *Id.*

Second, SWAPE points out that the solar panels are not a new component of the project, and the MND therefore fails to show how the proposed project is consistent with the Greener Glendale Strategies. *Id.* According to the MND, the Project plans to remove existing solar panels and relocate them to the roof, thus indicating that they are not a new addition. *Id.*; MND, p. 4.

Lastly, the MND is not consistent with SCAG's Regional Transportation Plan ("RTP")/SCS as it claims because it does not consider mitigation measures associated with SCAG's 2020 RTP/SCS Program Environmental Impact Report. Ex. A, p. 12. SWAPE recommends that the project prepare an EIR to consider two mitigation measures: Air Quality Project Level Mitigation Measures ("PMM-AQ-1") and Greenhouse Gas Project Level Mitigation Measures ("PMM-GHG-1"). *Id.* SWAPE's analysis demonstrated a potentially significant health risk impact from the project that necessitates mitigation, and its proposed measures offer a cost-effective solution to reduce emissions. *Id.* at 12-17. In addition to implementing these measures, the EIR should include an updated air quality, health risk, and GHG analysis. *Id.* at 16-17.

IV. CONCLUSION

In light of the above comments, the City must prepare an EIR for the Project and the draft EIR should be circulated for public review and comment in accordance with CEQA. Thank you for considering these comments.

Sincerely,

Richard Toshiyuki Drury
LOZEAU DRURY LLP

EXHIBIT A

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

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September 3, 2021

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Subject: Comments on the 901 S. Brand Glendale Project

Dear Mr. Drury,

We have reviewed the August 2021 Initial Study and Mitigated Negative Declaration ("IS/MND") for the Pacific BMW Dealership Expansion Project ("Project") located in the City of Glendale ("City"). The Project proposes to demolish 27,559-SF of existing buildings and associated parking, as well as construct a 171,140-SF above-ground parking structure on the 1.89-acre site.

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

Hazards and Hazardous Materials

Inadequate Analysis of Impacts

No Phase I Environmental Site Assessment ("ESA") was prepared for the Project site. The IS/MND simply states:

> "The Project site is not included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5. No impacts would occur" (p. 24).

However, the IS/MND provides no documentation, such as a Phase I ESA, to support the less-than-significant conclusion. The preparation of a Phase I ESA is often undertaken in the preparation of CEQA documents to identify hazardous waste issues that may present impacts to the public, workers, or the

environment, and which may require further investigation, including environmental sampling and cleanup.

Standards for performing a Phase I ESA have been established by the US EPA and the American Society for Testing and Materials Standards ("ASTM").[1] Phase I ESAs are conducted to identify conditions that would indicate a release of hazardous substances and include:

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

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

An updated EIR should be prepared and include a Phase I ESA, that is completed by a licensed environmental professional and adequately identifies RECs, if any, at the proposed Project site. If past land uses include RECs, a Phase II should be conducted to sample for residual concentrations of contaminants in soil. Any contamination that is identified above regulatory screening levels, including California Office of Environmental Health Hazard Assessment's Soil Screening Numbers[2], should be further evaluated and cleaned up, if necessary, in coordination with the Regional Water Quality Control Board and the California Department of Toxic Substances Control.

Air Quality

Unsubstantiated Input Parameters Used to Estimate Project Emissions

The IS/MND's air quality analysis relies on emissions calculated with CalEEMod V.2016.4.0 (p. 11).[3] CalEEMod provides recommended default values based on site-specific information, such as land use type, meteorological data, total lot acreage, project type and typical equipment associated with project type. If more specific project information is known, the user can change the default values and input project-specific values, but the California Environmental Quality Act ("CEQA") requires that such changes be justified by substantial evidence.[4] 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 were utilized in calculating the Project's air pollutant

[1] http://www.astm.org/Standards/E1527.htm
[2] http://oehha.ca.gov/risk/chhsltable.html
[3] CalEEMod User Guide, *available at:* http://www.caleemod.com/.
[4] CalEEMod User Guide, *available at:* http://www.caleemod.com/, p. 1, 9.

emissions and make known which default values were changed as well as provide justification for the values selected.[5]

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

Underestimated Land Use Size

According to the IS/MND:

> "There are currently three detached commercial buildings on the Project site: a one-story, 18,367 square-foot building originally constructed in 1924 (901 South Brand Boulevard), a one-story 9,192 square-foot building originally constructed in 1964 (915 South Brand Boulevard), and the one-story 561 square-foot accessory building that was relocated to the site in 1964 (919 South Brand Boulevard)" (p. 1).

As the existing 561-SF structure is the only building to be demolished, the model should have included 27,559-SF of floor surface area for the continued operation of the existing structures (p. 4). [6] However, review of the CalEEMod output files demonstrates that the "901 S Brand BMW Invetory Structure" model includes only 27,500-SF of "Automobile Care Center" (see excerpt below) (CalEEMod Outputs, pp. 1).

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Automobile Care Center	27.50	1000sqft	1.00	27,500.00	0
Unenclosed Parking with Elevator	171.14	1000sqft	0.60	171,140.00	0
Parking Lot	13.72	1000sqft	0.31	13,720.00	0

As you can see in the excerpt above, the "Automobile Care Center" was underestimated by 59-SF in the model. This underestimation presents an issue, as the land use size feature is used throughout CalEEMod to determine default variable and emission factors that go into the model's calculations. The square footage of a land use is used for certain calculations such as determining the wall space to be painted (i.e., VOC emissions from architectural coatings) and volume that is heated or cooled (i.e., energy impacts).[7] Thus, by underestimating the size of the continued operation of the existing buildings, the model underestimates the Project's operational emissions and should not be relied upon to determine Project significance.

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[5] CalEEMod User Guide, *available at:* http://www.caleemod.com/, p. 11, 12 – 13. A key feature of the CalEEMod program is the "remarks" feature, where the user explains why a default setting was replaced by a "user defined" value. These remarks are included in the report.

[6] Calculated: 18,367-SF building (901 South Brand Boulevard) + 9,192-SF building (915 South Brand Boulevard) = 27,559-SF.

[7] CalEEMod User Guide, *available at:* http://www.caleemod.com/, p. 28.

Unsubstantiated Reduction to Default Acres of Grading Values

Review of the CalEEMod output files demonstrates that the "901 S Brand BMW Invetory Structure" model includes manual reductions to the default acres of grading values (see excerpt below) (CalEEMod Outputs, pp. 2).

Table Name	Column Name	Default Value	New Value
tblGrading	AcresOfGrading	2.25	1.50
tblGrading	AcresOfGrading	2.50	1.00

As you can see in the excerpt above, the acres of grading values were reduced by approximately 33%, from the default value of 2.25- to 1.50-acres, and 60% from the default value of 2.50- to 1.00-acres. As previously mentioned, the CalEEMod User's Guide requires any changes to model defaults be justified.[8] However, the "User Entered Comments & Non-Default Data" table fails to provide justification for this change (CalEEMod Outputs, pp. 1). Furthermore, the IS/MND fails to mention or justify the revised acres of grading values. As such, we cannot verify these changes.

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

Failure to Model All Required Demolition

According to the CalEEMod User's Guide, "[h]aul trips are based on the amount of material that is demolished, imported or exported assuming a truck can handle 16 cubic yards of material."[10] Therefore, the air model calculates a default number of hauling trips based upon the amount of demolition material inputted into the model. According to the IS/MND:

> "The proposed Project involves the demolition of the existing surface parking lot, an existing 561 square-foot accessory building (relocated to the site in 1964) and removal of existing solar panel structures that will be relocated to the rooftop of the new structure" (p. 1).

Furthermore, according to the "User Entered Comments & Non-Default Data" table, "[d]emolition will include an at-grade asphalt parking lot (approximately 155' x 220' [34,100-SF]) and a 561 square-foot building" (CalEEMod Outputs, pp. 1). As such, the model should have included 34,661-SF of demolition.[11]

When correctly inputting 34,661-SF of demolition into CalEEMod, our model calculates a default demolition hauling trip number of 158 trips. However, review of the CalEEMod output files

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[8] CalEEMod User Guide, *available at:* http://www.caleemod.com/, p. 2, 9

[9] "Appendix A Calculation Details for CalEEMod." *available at:* http://www.aqmd.gov/docs/default-source/caleemod/02_appendix-a2016-3-2.pdf?sfvrsn=6, p. 9.

[10] http://www.aqmd.gov/docs/default-source/caleemod/02_appendix-a2016-3-2.pdf?sfvrsn=6, p. 14

[11] Calculated: (561-SF of building demolition) + (34,100-SF of asphalt parking lot demolition) = 34,661-SF of demolition.

demonstrates that the "901 S Brand BMW Invetory Structure" model includes only 105 total default hauling trips (see excerpts below) (CalEEMod Outputs, pp. 7).

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number
Demolition	5	13.00	0.00	105.00
Site Preparation	3	8.00	0.00	0.00
Grading	3	8.00	0.00	219.00
Building Construction	7	86.00	35.00	0.00
Paving	5	13.00	0.00	0.00
Architectural Coating	1	17.00	0.00	0.00

As you can see in the excerpt above, the default number of demolition hauling trips was underestimated by 53 trips. As such, the model fails to include the total amount of demolition required for the Project.

This underestimation presents an issue, as the total amount of demolition material is used by CalEEMod to determine emissions associated with this phase of construction; the three primary operations that generate dust emission during the demolition phase are mechanical or explosive dismemberment, site removal of debris, and on-site truck traffic on paved and unpaved road.[12] By failing to include the total amount of required demolition, the model underestimates emissions associated with fugitive dust, site removal, as well as exhaust from hauling trucks traveling to and from the site, and should not be relied upon to determine the significance of the Project's air quality impacts.

Diesel Particulate Matter Health Risk Emissions Inadequately Evaluated

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

First, by failing to quantitatively evaluate the Project's construction-related and operational TAC emissions, the IS/MND fails to make a reasonable effort to connect these emissions to potential health risk impacts posed to nearby existing sensitive receptors. This is incorrect, as construction of the proposed Project would produce diesel particulate matter ("DPM") emissions through the exhaust stacks of construction equipment over a potential construction period of approximately 350 days (CalEEMod Outputs, pp. 5). Furthermore, Project operation would generate approximately 652 weekday and Saturday, and 326 Sunday, daily vehicle trips, which would generate additional exhaust emissions and continue to expose nearby sensitive receptors to DPM emissions (CalEEMod Outputs, pp. 22). However, the IS/MND fails to discuss Project-generated TACs or indicate the concentrations at which such pollutants would trigger adverse health effects. Thus, without making a reasonable effort to connect the Project's construction-related and operational TAC emissions to the potential health risks

[12] CalEEMod User Guide, Appendix A, p. 11, *available at:* http://www.caleemod.com/

posed to nearby receptors, the IS/MND is inconsistent with CEQA's requirement to correlate the increase in emissions generated by the Project with the 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. The OEHHA document recommends that all short-term projects lasting at least two months be evaluated for cancer risks to nearby sensitive receptors. As the Project's construction duration vastly exceeds the 2-month requirement set forth by OEHHA, it is clear that the Project meets the threshold warranting a quantified HRA under OEHHA guidance. Furthermore, the OEHHA document recommends that exposure from projects lasting more than 6 months be evaluated for the duration of the project and recommends that an exposure duration of 30 years be used to estimate individual cancer risk for the maximally exposed individual resident ("MEIR"). Even though we were not provided with the expected lifetime of the Project, we can reasonably assume that the Project will operate for at least 30 years, if not more. Therefore, we recommend that health risk impacts from Project operation also be evaluated, as a 30-year exposure duration vastly exceeds the 6-month requirement set forth by OEHHA. These recommendations reflect the most recent state health risk policies, and as such, we recommend that an analysis of health risk impacts posed to nearby sensitive receptors from Project-generated DPM emissions be included in an EIR for the Project.

Third, by claiming a less than significant impact without conducting a quantified construction or operational HRA for nearby, existing sensitive receptors, the IS/MND fails to compare the excess health risk impact to the applicable SCAQMD threshold of 10 in one million.[13] Thus, pursuant to CEQA, an analysis of the health risk posed to nearby, existing receptors from Project construction and operation should have been conducted.

Screening-Level Analysis Indicates a Potentially Significant Health Risk Impact

In order to conduct our screening-level risk analysis we relied upon AERSCREEN, which is a screening level air quality dispersion model.[14] The model replaced SCREEN3, and AERSCREEN is included in the OEHHA[15] and the California Air Pollution Control Officers Associated ("CAPCOA")[16] guidance as the appropriate air dispersion model for Level 2 health risk screening analyses ("HRSAs"). 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

[13] "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?sfvrsn=2.

[14] U.S. EPA (April 2011) AERSCREEN Released as the EPA Recommended Screening Model, http://www.epa.gov/ttn/scram/guidance/clarification/20110411_AERSCREEN_Release_Memo.pdf

[15] "Risk Assessment Guidelines Guidance Manual for Preparation of Health Risk Assessments." OEHHA, February 2015, *available at:* http://oehha.ca.gov/air/hot_spots/2015/2015GuidanceManual.pdf

[16] CAPCOA (July 2009) Health Risk Assessments for Proposed Land Use Projects, http://www.capcoa.org/wp-content/uploads/2012/03/CAPCOA_HRA_LU_Guidelines_8-6-09.pdf.

unacceptable air quality hazard is determined to be possible using AERSCREEN, a more refined modeling approach is required prior to approval of the Project.

In order to estimate the health risk impacts posed to residential sensitive receptors as a result of the Project's construction-related and operational TAC emissions, we prepared a preliminary HRA using the annual PM_{10} exhaust estimates from the CalEEMod output files included in the IS/MND. Consistent with recommendations set forth by OEHHA, we assumed residential exposure begins during the third trimester stage of life. The IS/MND's CalEEMod model indicates that construction activities will generate approximately 66 pounds of DPM over the 350-day construction period (CalEEMod Output files, pp. 7). 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:

$$Emission\ Rate\ \left(\frac{grams}{second}\right) = \frac{65.9\ lbs}{350\ days} \times \frac{453.6\ grams}{lbs} \times \frac{1\ day}{24\ hours} \times \frac{1\ hour}{3{,}600\ seconds} = \mathbf{0.000989\ g/s}$$

Using this equation, we estimated a construction emission rate of 0.000989 grams per second ("g/s"). Subtracting the 350-day construction period from the total residential duration of 30 years, we assumed that after Project construction, the sensitive receptor would be exposed to the Project's operational DPM for an additional 29.04 years, approximately. The IS/MND's operational CalEEMod emissions indicate that operational activities will generate approximately 10 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:

$$Emission\ Rate\ \left(\frac{grams}{second}\right) = \frac{9.5\ lbs}{365\ days} \times \frac{453.6\ grams}{lbs} \times \frac{1\ day}{24\ hours} \times \frac{1\ hour}{3{,}600\ seconds} = \mathbf{0.000137\ g/s}$$

Using this equation, we estimated an operational emission rate of 0.0007888 g/s. Construction and operational activity was simulated as a 1.89-acre rectangular area source in AERSCREEN with dimensions of approximately 124- by 62-meters. A release height of three meters was selected to represent the height of exhaust stacks on 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 AERSCREEN model generates maximum reasonable estimates of single-hour DPM concentrations from the Project site. EPA guidance suggests that in screening procedures, the annualized average concentration of an air pollutant be estimated by multiplying the single-hour concentration by 10%.[17] While the IS/MND makes no mention of the nearest sensitive receptors, review of Google Earth

[17] "Screening Procedures for Estimating the Air Quality Impact of Stationary Sources Revised." EPA, 1992, *available at*: http://www.epa.gov/ttn/scram/guidance/guide/EPA-454R-92-019_OCR.pdf; *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 p. 4-36.

demonstrates that the nearest sensitive receptors are residences immediately west of the project site. However, review of the AERSCREEN output files demonstrates that the maximally exposed individual resident ("MEIR") is located approximately 50 meters from the Project site. Thus, the single-hour concentration estimated by AERSCREEN for Project construction is approximately 3.201 µg/m^3 DPM at approximately 50 meters downwind. Multiplying this single-hour concentration by 10%, we get an annualized average concentration of 0.3201 µg/m^3 for Project construction at the MEIR. For Project operation, the single-hour concentration estimated by AERSCREEN is 0.4431 µg/m^3 DPM at approximately 50 meters downwind. Multiplying this single-hour concentration by 10%, we get an annualized average concentration of 0.04431 µg/m^3 for Project operation at the MEIR.

We calculated the excess cancer risk to the MEIR using applicable HRA methodologies prescribed by OEHHA. Consistent with the 350-day construction schedule included in the Project's CalEEMod output files, the annualized average concentration for Project construction was used for the entire third trimester of pregnancy (0.25 years) and the first 0.71 years of the infantile stage of life (0 – 2 years); and the annualized averaged concentration for operation was used for the remainder of the 30-year exposure period, which makes up the remaining and the 1.29 years of the infantile stage of life (0 – 2 years), the entire child stage of life, and the entire adult stage of life (16 – 30 years).

Consistent with OEHHA guidance and recommended by the SCAQMD, BAAQMD, and SJVAPCD guidance, we used Age Sensitivity Factors ("ASF") to account for the heightened susceptibility of young children to the carcinogenic toxicity of air pollution.[18, 19, 20] According to this guidance, the quantified cancer risk should be multiplied by a factor of ten during the third trimester of pregnancy and during the first two years of life (infant), as well as multiplied by a factor of three during the child stage of life (2 – 16 years). We also included the quantified cancer risk without adjusting for the heightened susceptibility of young children to the carcinogenic toxicity of air pollution in accordance with older OEHHA guidance from 2003. This guidance utilizes a less health protective scenario than what is currently recommended by SCAQMD, the air quality district with jurisdiction over the City, and several other air districts in the state. Furthermore, in accordance with the guidance set forth by OEHHA, we used the 95th percentile breathing rates for infants.[21] Finally, according to SCAQMD guidance, we used a Fraction of Time At

[18] "Draft Environmental Impact Report (DEIR) for the Proposed The Exchange (SCH No. 2018071058)." SCAQMD, March 2019, *available at:* http://www.aqmd.gov/docs/default-source/ceqa/comment-letters/2019/march/RVC190115-03.pdf?sfvrsn=8, p. 4.

[19] "California Environmental Quality Act Air Quality Guidelines." BAAQMD, May 2017, *available at:* http://www.baaqmd.gov/~/media/files/planning-and-research/ceqa/ceqa_guidelines_may2017-pdf.pdf?la=en, p. 56; see also "Recommended Methods for Screening and Modeling Local Risks and Hazards." BAAQMD, May 2011, *available at:* http://www.baaqmd.gov/~/media/Files/Planning%20and%20Research/CEQA/BAAQMD%20Modeling%20Approach.ashx, p. 65, 86.

[20] "Update to District's Risk Management Policy to Address OEHHA's Revised Risk Assessment Guidance Document." SJVAPCD, May 2015, *available at:* https://www.valleyair.org/busind/pto/staff-report-5-28-15.pdf, p. 8, 20, 24.

[21] "Supplemental Guidelines for Preparing Risk Assessments for the Air Toxics 'Hot Spots' Information and Assessment Act," July 2018, *available at:* http://www.aqmd.gov/docs/default-source/planning/risk-assessment/ab2588supplementalguidelines.pdf, p. 16.

Home ("FAH") Value of 1 for the 3rd trimester and infant receptors.[22] We used a cancer potency factor of 1.1 (mg/kg-day)$^{-1}$ and an averaging time of 25,550 days. The results of our calculations are shown below.

The Maximally Exposed Individual at an Existing Residential Receptor

Age Group	Emissions Source	Duration (years)	Concentration (ug/m3)	Breathing Rate (L/kg-day)	Cancer Risk (without ASFs*)	ASF	Cancer Risk (with ASFs*)
3rd Trimester	Construction	0.25	0.3201	361	4.35E-07	10	**4.35E-06**
Infant (Age 0 - 2)	*Construction*	*0.71*	*0.3201*	*1090*	*3.73E-06*	10	**4.67E-05**
	Operation	*1.29*	*0.04431*	*1090*	*9.40E-07*		
	Total	2			4.67E-06		
Child (Age 2 - 16)	Operation	14	0.04431	572	5.35E-06	3	**1.60E-05**
Adult (Age 16 - 30)	Operation	14	0.04431	261	1.78E-06	1	**1.78E-06**
Lifetime		**30**			**1.22E-05**		**6.88E-05**

* We, along with CARB and SCAQMD, recommend using the more updated and health protective 2015 OEHHA guidance, which includes ASFs.

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 50 meters away, over the course of Project construction and operation, utilizing ASFs, is approximately 4.35, 46.7, 16, and 1.78 in one million, respectively. The excess cancer risk over the course of a residential lifetime (30 years), utilizing ASFs, is approximately 68.6 in one million. The 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 IS/MND.

Utilizing ASFs is the most conservative, health-protective analysis according to the most recent guidance by OEHHA and reflects recommendations from the air district. Results without ASFs are presented in the table above, although we do not recommend utilizing these values for health risk analysis. Regardless, excess cancer risks for the 3rd trimester of pregnancy, infants, children, and adults at the MEIR located approximately 50 meters away, over the course of Project construction and operation, without ASFs, are approximately 0.435, 4.67, 5.35, and 1.78 in one million, respectively. The excess cancer risk over the course of a residential lifetime (30 years), without ASFs, is approximately 12.2 in one million, which exceeds the SCAQMD threshold of 10 in one million and results in a potentially significant impact not

"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

[22] "Risk Assessment Procedures for Rules 1401, 1401.1, and 212." SCAQMD, August 2017, *available at:* http://www.aqmd.gov/docs/default-source/rule-book/Proposed-Rules/1401/riskassessmentprocedures_2017_080717.pdf, p. 7.

previously addressed or identified by the IS/MND. While we recommend the use of ASFs, the Project's cancer risk without ASFs, as estimated by SWAPE, exceeds the SCAQMD threshold regardless.

An agency must include an analysis of health risks that connects the Project's air emissions with the health risk posed by those emissions. Our analysis represents a screening-level HRA, which is known to be conservative and tends to err on the side of health protection. [23] The purpose of the screening-level construction and operational HRA shown above is to demonstrate the link between the proposed Project's emissions and the potential health risk. Our screening-level HRA demonstrates that construction and operation of the Project could result in a potentially significant health risk impact, when correct exposure assumptions and up-to-date, applicable guidance are used. Therefore, our screening-level HRA indicates a potentially significant impact, the City should prepare an EIR analysis with an HRA which makes a reasonable effort to connect the Project's air quality emissions and the potential health risks posed to nearby receptors. Thus, the City should prepare an updated, quantified air pollution model as well as an updated, quantified refined health risk analysis which adequately and accurately evaluates health risk impacts associated with both Project construction and operation.

Energy

Failure to Adequately Evaluate Energy Impacts

According to CEQA Guidelines Appendix F:

> "The goal of conserving energy implies the wise and efficient use of energy. The means of achieving this goal include:
>
> (1) decreasing overall per capita energy consumption,
> (2) decreasing reliance on fossil fuels such as coal, natural gas and oil, and
> (3) increasing reliance on renewable energy sources.
>
> In order to assure that energy implications are considered in project decisions, the California Environmental Quality Act requires *that EIRs include a discussion of the potential energy impacts of proposed projects, with particular emphasis on avoiding or reducing inefficient, wasteful and unnecessary consumption of energy*."[24]

However, in order to conclude a less-than-significant energy impact, the IS/MND simply states that Project compliance with Title 24 standards and California Green Building Standards ("CalGreen") would prevent the Project from resulting in an inefficient, wasteful, and unnecessary consumption of energy. Specifically, the IS/MND states:

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[23] "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. 1-5

[24] "APPENDIX F: ENERGY CONSERVATION." CEQA Guidelines Appendices, 2016, *available at:* https://resources.ca.gov/CNRALegacyFiles/ceqa/docs/2016_CEQA_Statutes_and_Guidelines_Appendix_F.pdf, p. 276.

> "The proposed Project would be designed to comply with Title 24 Building, Energy and Green Buildings Standards (California Building Code, Title 24, Parts 4, 6, and 11). Sustainable design strategies for the proposed parking structure would include energy-efficient light fixtures and lighting controls, and water-conserving plumbing fixtures. Additionally, the existing solar panel structures will be relocated to the roof of the new parking structure. Given the foregoing, the Project's consumption of energy resources would be less than significant, as it would not represent unnecessary, inefficient, or wasteful use of energy resources" (p. 17).

However, noting compliance with the Title 24 standards does not constitute an adequate analysis of energy. According to Ukiah Citizens for Safety First v. City of Ukiah (2016) 248 Cal.App.4th 256, the court ruled:

> "With respect to the analysis of operational and construction energy use of the project, the court found that the City of Woodland's reliance on mitigation measures that required *compliance with title 24 and other California green building codes did not meet the requirements of appendix F*" (emphasis added).[25]

As demonstrated above, simply complying with Title 24 standards does not meet the requirements of CEQA Guidelines Appendix F. As such, the Project's energy analysis is insufficient and the IS/MND's less-than-significant impact conclusion should not be relied upon.

Greenhouse Gas

Failure to Adequately Evaluate Greenhouse Gas Impacts

Regarding the Project's potential greenhouse gas ("GHG") impacts, the IS/MND states:

> "The solar panels will generate energy that will be fed into the City's electrical grid, which would assist the City in meeting its renewable energy portfolio, a strategy specified in the Greener Glendale Plan to accomplish Objective E1, to increase the use of renewable energy citywide. As it relates to energy consumption, the relocation of the solar panels to the roof of the new parking structure will be consistent with this objective of the Greener Glendale Plan. Since this proposed Project is consistent with Greener Glendale Strategies to reduce GHGs and the SCS prepared by SCAG, the Project would result in a less than cumulatively considerable impact on GHG emissions" (p. 22)

As stated in the excerpt above, the IS/MND claims that the Project would result in a less-than-significant GHG impact due to the on-site renewable energy generation associated with the existing solar panels. However, this conclusion is insufficient for three reasons.

[25] "Ukiah Citizens for Safety First v. City of Ukiah (2016) 248 Cal.App.4th 256." COURT OF APPEAL OF THE STATE OF CALIFORNIA FIRST APPELLATE DISTRICT DIVISION THREE, *available at:* https://ceqaportal.org/decisions/1805/Ukiah%20Citizens%20for%20Safety%20First%20v.%20City%20of%20Ukiah%20(1st%20Dist.%202016)%20248%20Cal.App.4th%20256.PD, p. 7.

First, the IS/MND fails to mention how much renewable energy the Project anticipates on generating. Without additional information regarding the renewable energy generated by the solar panels, we cannot verify that the Project's potential GHG impacts would be less-than-significant.

Second, the solar panels are not a new component of the proposed Project. Specifically, the IS/MND states that the Project includes the "removal of existing solar panel structures that will be relocated to the rooftop of the new structure" (p. 4). As such, the IS/MND fails to demonstrate how the *proposed* Project is consistent with the Greener Glendale Strategies.

Third, the IS/MND claims to be consistent with SCAG's RTP/SCS (p. 20). However, the IS/MND fails to consider the mitigation measures associated with SCAG's 2020 RTP/SCS PEIR. [26] As such, in order to demonstrate consistency with SCAG's RTP/SCS, we recommend that the IS/MND consider the Air Quality Project Level Mitigation Measures ("PMM-AQ-1") and the Greenhouse Gas Project Level Mitigation Measures ("PMM-GHG-1"), as listed in the section below titled "Feasible Mitigation Measures under SCAG's *RTP/SCS* Available to Reduce Emissions."

For the reasons listed above, an updated EIR should be prepared that adequately assesses the potential GHG impacts that construction and operation of the proposed Project may have on the surrounding environment.

Feasible Mitigation Measures under SCAG's *RTP/SCS* Available to Reduce Emissions

Our analysis demonstrates that the Project would result in a potentially significant health risk impact that should be mitigated further. In an effort to reduce the Project's emissions, we identified several mitigation measures that are applicable to the proposed Project. As discussed above, feasible mitigation measures can be found in SCAG's 2020 RTP/SCS PEIR. [27] Therefore, to reduce the Project's emissions, consideration of the Air Quality Project Level Mitigation Measures ("PMM-AQ-1") and the Greenhouse Gas Project Level Mitigation Measures ("PMM-GHG-1") should be made:

[26] "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.

[27] "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.

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:
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.
i) On Caltrans projects, Caltrans Standard Specifications 10-Dust Control, 17-Watering, and 18-Dust Palliative shall be incorporated into project specifications.
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) As applicable for airport projects, the following measures should be considered…

w) As applicable for port projects, the following measures should be considered…

x) As applicable for rail projects, the following measures should be considered…

y) 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.

z) 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 […]

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 […]

Greenhouse Gas Project Level Mitigation Measures – PMM-GHG-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:

a) Integrate green building measures consistent with CALGreen (California Building Code Title 24), local building codes and other applicable laws, into project design including

i. Use energy efficient materials in building design, construction, rehabilitation, and retrofit.
ii. Install energy-efficient lighting, heating, and cooling systems (cogeneration); water heaters; appliances; equipment; and control systems.
iii. Reduce lighting, heating, and cooling needs by taking advantage of light-colored roofs, trees for shade, and sunlight.
iv. Incorporate passive environmental control systems that account for the characteristics of the natural environment.
v. Use high-efficiency lighting and cooking devices.
vi. Incorporate passive solar design.
vii. Use high-reflectivity building materials and multiple glazing.
viii. Prohibit gas-powered landscape maintenance equipment.
ix. Install electric vehicle charging stations.
x. Reduce wood burning stoves or fireplaces.
xi. Provide bike lanes accessibility and parking at residential developments.

b) Reduce emissions resulting from projects through implementation of project features, project design, or other measures, such as those described in Appendix F of the State CEQA Guidelines.

c) Include off-site measures to mitigate a project's emissions.

d) Measures that consider incorporation of Best Available Control Technology (BACT) during design, construction and operation of projects to minimize GHG emissions, including but not limited to:

i. Use energy and fuel-efficient vehicles and equipment;
ii. Deployment of zero- and/or near zero emission technologies;
iii. Use lighting systems that are energy efficient, such as LED technology;
iv. Use the minimum feasible amount of GHG-emitting construction materials;
v. Use cement blended with the maximum feasible amount of flash or other materials that reduce GHG emissions from cement production;
vi. Incorporate design measures to reduce GHG emissions from solid waste management through encouraging solid waste recycling and reuse;
vii. Incorporate design measures to reduce energy consumption and increase use of renewable energy;
viii. Incorporate design measures to reduce water consumption;
ix. Use lighter-colored pavement where feasible;
x. Recycle construction debris to maximum extent feasible;
xi. Plant shade trees in or near construction projects where feasible; and
xii. Solicit bids that include concepts listed above.

e) Measures that encourage transit use, carpooling, bike-share and car-share programs, active transportation, and parking strategies, including, but not limited to the following:

i. Promote transit-active transportation coordinated strategies;
ii. Increase bicycle carrying capacity on transit and rail vehicles;
iii. Improve or increase access to transit;
iv. Increase access to common goods and services, such as groceries, schools, and day care;
v. Incorporate affordable housing into the project;
vi. Incorporate the neighborhood electric vehicle network;
vii. Orient the project toward transit, bicycle and pedestrian facilities;
viii. Improve pedestrian or bicycle networks, or transit service;
ix. Provide traffic calming measures;
x. Provide bicycle parking;
xi. Limit or eliminate park supply;
xii. Unbundle parking costs;
xiii. Provide parking cash-out programs;
xiv. Implement or provide access to commute reduction program;

f) Incorporate bicycle and pedestrian facilities into project designs, maintaining these facilities, and providing amenities incentivizing their use; and planning for and building local bicycle projects that connect with the regional network;

g) Improving transit access to rail and bus routes by incentives for construction and transit facilities within developments, and/or providing dedicated shuttle service to transit stations; and

h) Adopting employer trip reduction measures to reduce employee trips such as vanpool and carpool programs, providing end-of-trip facilities, and telecommuting programs including but not limited to measures that:

i. Provide car-sharing, bike sharing, and ride-sharing programs;
ii. Provide transit passes;

iii. Shift single occupancy vehicle trips to carpooling or vanpooling, for example providing ride-matching services;
iv. Provide incentives or subsidies that increase that use of modes other than single-occupancy vehicle; v. Provide on-site amenities at places of work, such as priority parking for carpools and vanpools, secure bike parking, and showers and locker rooms; vi. Provide employee transportation coordinators at employment sites; vii. Provide a guaranteed ride home service to users of non-auto modes.
i) Designate a percentage of parking spaces for ride-sharing vehicles or high-occupancy vehicles, and provide adequate passenger loading and unloading for those vehicles;
j) Land use siting and design measures that reduce GHG emissions, including: i. Developing on infill and brownfields sites; ii. Building compact and mixed-use developments near transit; iii. Retaining on-site mature trees and vegetation, and planting new canopy trees; iv. Measures that increase vehicle efficiency, encourage use of zero and low emissions vehicles, or reduce the carbon content of fuels, including constructing or encouraging construction of electric vehicle charging stations or neighborhood electric vehicle networks, or charging for electric bicycles; and v. Measures to reduce GHG emissions from solid waste management through encouraging solid waste recycling and reuse.
k) Consult the SCAG Environmental Justice Toolbox for potential measures to address impacts to low-income and/or minority communities. The measures provided above are also intended to be applied in low income and minority communities as applicable and feasible.
l) Require at least five percent of all vehicle parking spaces include electric vehicle charging stations, or at a minimum, require the appropriate infrastructure to facilitate sufficient electric charging for passenger vehicles and trucks to plug-in.
m) Encourage telecommuting and alternative work schedules, such as: i. Staggered starting times ii. Flexible schedules iii. Compressed work weeks
n) Implement commute trip reduction marketing, such as: i. New employee orientation of trip reduction and alternative mode options ii. Event promotions iii. Publications
o) Implement preferential parking permit program
p) Implement school pool and bus programs
q) Price workplace parking, such as: i. Explicitly charging for parking for its employees; ii. Implementing above market rate pricing; iii. Validating parking only for invited guests; iv. Not providing employee parking and transportation allowances; and v. Educating employees about available alternatives.

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. An EIR should be prepared to include all feasible mitigation measures, as well as include an

updated air quality, health risk, and GHG analysis to ensure that the necessary mitigation measures are implemented to reduce emissions to below thresholds. The EIR should also demonstrate a commitment to the implementation of these measures prior to Project approval, to ensure that the Project's significant emissions are reduced to the maximum extent possible.

Disclaimer

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

Sincerely,

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

Paul E. Rosenfeld, Ph.D.

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

Attachment A

Construction					
2021			**Total**		
Annual Emissions (tons/year)	0.0354		Total DPM (lbs)	65.94739726
Daily Emissions (lbs/day)	0.193972603		Total DPM (g)	29913.7394
Construction Duration (days)	153		Total Construction Days	350
Total DPM (lbs)	29.67780822		Emission Rate (g/s)	0.000989211
Total DPM (g)	13461.85381		Release Height (meters)	3
Start Date	8/1/2022		Total Acreage	1.89
End Date	1/1/2023		Max Horizontal (meters)	123.68
Construction Days	153		Min Horizontal (meters)	61.84
2022			Initial Vertical Dimension (meters)	1.5
Annual Emissions (tons/year)	0.0336		Setting	Urban
Daily Emissions (lbs/day)	0.184109589		Population	200,232
Construction Duration (days)	197		Start Date	8/1/2022
Total DPM (lbs)	36.26958904		End Date	7/17/2023
Total DPM (g)	16451.88559		Total Construction Days	350
Start Date	1/1/2023		Total Years of Construction	0.96
End Date	7/17/2023		Total Years of Operation	29.04
Construction Days	197			

Operation	
Emission Rate	
Annual Emissions (tons/year)	0.00475
Daily Emissions (lbs/day)	0.026027397
Emission Rate (g/s)	0.000136644
Release Height (meters)	3
Total Acreage	1.89
Max Horizontal (meters)	123.68
Min Horizontal (meters)	61.84
Initial Vertical Dimension (meters)	1.5
Setting	Urban
Population	200,232
Total Pounds of DPM	
Total DPM (lbs)	9.5

Start date and time 09/03/21 12:35:22

AERSCREEN 16216

901 S Brand Glendale Construction

901 S Brand Glendale Construction

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

	METRIC	ENGLISH
** AREADATA **	---	---
Emission Rate:	0.989E-03 g/s	0.785E-02 lb/hr
Area Height:	3.00 meters	9.84 feet
Area Source Length:	123.68 meters	405.77 feet
Area Source Width:	61.84 meters	202.89 feet
Vertical Dimension:	1.50 meters	4.92 feet
Model Mode:	URBAN	
Population:	200232	
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:

2021.09.03_901SBrandGlendale_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 09/03/21 12:42:29

****

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 09/03/21 12:42:37

REFINE       started 09/03/21 12:42:37

 AERMOD Finishes Successfully for REFINE stage 3 Winter sector   0

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

*** NONE ***

REFINE ended 09/03/21 12:42:38

****

AERSCREEN Finished Successfully

With no errors or warnings

Check log file for details

****

Ending date and time 09/03/21 12:42:40

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
0.25051E+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
0.28846E+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
0.32010E+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
* 0.33198E+01	63.00	0.00	0.0	Winter	0-360	10011001	-1.30	0.043	-9.000	0.020	-999.	21.	6.0	1.000	1.50	0.35	0.50	10.0	310.0	2.0
0.27667E+01	75.00	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
0.16809E+01	100.00	0.00	0.0	Winter	0-360	10011001	-1.30	0.043	-9.000	0.020	-999.	21.	6.0	1.000	1.50	0.35	0.50	10.0	310.0	2.0
0.12238E+01	125.00	0.00	0.0	Winter	0-360	10011001	-1.30	0.043	-9.000	0.020	-999.	21.	6.0	1.000	1.50	0.35	0.50	10.0	310.0	2.0
0.94665E+00	150.00	0.00	0.0	Winter	0-360	10011001	-1.30	0.043	-9.000	0.020	-999.	21.	6.0	1.000	1.50	0.35	0.50	10.0	310.0	2.0
0.76266E+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
0.63347E+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
0.53811E+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
0.46529E+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
0.40807E+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
0.36186E+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
0.32431E+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
0.29295E+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
0.26651E+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
0.24389E+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
0.22448E+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
0.20759E+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
0.19270E+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
0.17960E+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
0.16799E+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
0.15765E+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
0.14837E+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
0.13998E+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
0.13238E+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
0.12548E+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
0.11914E+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
0.11334E+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
0.10802E+00 725.00 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
0.10312E+00 750.00 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
0.98596E-01 775.00 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
0.94407E-01 800.00 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
0.90521E-01 825.00 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
0.86906E-01 850.00 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
0.83539E-01 875.00 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
0.80389E-01 900.00 0.00 5.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.77439E-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
0.74678E-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
0.72084E-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
0.69642E-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
0.67342E-01 1025.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.65172E-01 1050.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.63114E-01 1075.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.61163E-01 1100.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.59315E-01 1125.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.57810E-01 1150.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.56128E-01 1175.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.54529E-01 1200.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.53008E-01 1225.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.51558E-01 1250.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.50176E-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
  0.48857E-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
  0.47597E-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
  0.46392E-01    1350.00     0.00  5.0      Winter     0-360  10011001  -1.30  0.043 -9.000  0.020 -999.  21.     6.0
1.000  1.50  0.35   0.50  10.0  310.0   2.0
  0.45238E-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
  0.44134E-01    1400.00     0.00  5.0      Winter     0-360  10011001  -1.30  0.043 -9.000  0.020 -999.  21.     6.0
1.000  1.50  0.35   0.50  10.0  310.0   2.0
  0.43075E-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
  0.42060E-01    1450.00     0.00  5.0      Winter     0-360  10011001  -1.30  0.043 -9.000  0.020 -999.  21.     6.0
1.000  1.50  0.35   0.50  10.0  310.0   2.0
  0.41086E-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
  0.40149E-01    1500.00     0.00  5.0      Winter     0-360  10011001  -1.30  0.043 -9.000  0.020 -999.  21.     6.0
1.000  1.50  0.35   0.50  10.0  310.0   2.0
  0.39250E-01    1525.00     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
  0.38384E-01    1550.00     0.00  5.0      Winter     0-360  10011001  -1.30  0.043 -9.000  0.020 -999.  21.     6.0
1.000  1.50  0.35   0.50  10.0  310.0   2.0
  0.37551E-01    1575.00     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
  0.36749E-01    1600.00     0.00  5.0      Winter     0-360  10011001  -1.30  0.043 -9.000  0.020 -999.  21.     6.0
1.000  1.50  0.35   0.50  10.0  310.0   2.0
  0.35976E-01    1625.00     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
  0.35231E-01    1650.00     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
  0.34512E-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
  0.33819E-01    1700.00     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
  0.33149E-01    1725.00     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
  0.32501E-01    1750.00     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
  0.31875E-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
  0.31270E-01    1800.00     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
  0.30685E-01    1824.99     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
  0.30118E-01    1850.00     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
  0.29569E-01    1875.00     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
  0.29037E-01    1900.00     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
  0.28522E-01    1924.99     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
  0.28022E-01    1950.00     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
0.27537E-01 1975.00 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
0.27066E-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
0.26610E-01 2025.00 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
0.26166E-01 2050.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.25735E-01 2075.00 0.00 5.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.25316E-01 2100.00 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
0.24909E-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
0.24513E-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
0.24128E-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
0.23753E-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
0.23389E-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
0.23033E-01 2250.00 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
0.22688E-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
0.22350E-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
0.22022E-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
0.21702E-01 2350.00 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
0.21389E-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
0.21085E-01 2400.00 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
0.20788E-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
0.20498E-01 2449.99 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
0.20215E-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
0.19939E-01 2500.00 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
0.19669E-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
0.19405E-01 2550.00 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
0.19148E-01 2575.00 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
0.18896E-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
0.18650E-01 2625.00 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
0.18410E-01 2650.00 0.00 15.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.18174E-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
0.17944E-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
0.17719E-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
0.17499E-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
0.17284E-01 2775.00 0.00 10.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.17073E-01 2800.00 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
0.16866E-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
0.16664E-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
0.16466E-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 10.0 310.0 2.0
0.16272E-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
0.16082E-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
0.15896E-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
0.15713E-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
0.15534E-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
0.15359E-01 3025.00 0.00 10.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.15187E-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
0.15018E-01 3075.00 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
0.14852E-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
0.14690E-01 3125.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.14531E-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
0.14374E-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
0.14221E-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
0.14070E-01 3225.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.13922E-01 3250.00 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
0.13777E-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
0.13635E-01 3300.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0

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1.000  1.50  0.35   0.50  10.0  310.0   2.0
  0.13494E-01    3325.00     0.00 15.0     Winter     0-360   10011001  -1.30  0.043 -9.000  0.020 -999.   21.     6.0
1.000  1.50  0.35   0.50  10.0  310.0   2.0
  0.13357E-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
  0.13222E-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
  0.13089E-01    3400.00     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
  0.12958E-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
  0.12830E-01    3450.00     0.00  5.0     Winter     0-360   10011001  -1.30  0.043 -9.000  0.020 -999.   21.     6.0
1.000  1.50  0.35   0.50  10.0  310.0   2.0
  0.12704E-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
  0.12580E-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
  0.12458E-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
  0.12338E-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
  0.12220E-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
  0.12104E-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
  0.11990E-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
  0.11878E-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
  0.11767E-01    3675.00     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
  0.11658E-01    3700.00     0.00  0.0     Winter     0-360   10011001  -1.30  0.043 -9.000  0.020 -999.   21.     6.0
1.000  1.50  0.35   0.50  10.0  310.0   2.0
  0.11552E-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
  0.11446E-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
  0.11343E-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
  0.11241E-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
  0.11140E-01    3825.00     0.00  5.0     Winter     0-360   10011001  -1.30  0.043 -9.000  0.020 -999.   21.     6.0
1.000  1.50  0.35   0.50  10.0  310.0   2.0
  0.11041E-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
  0.10944E-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
  0.10848E-01    3900.00     0.00 15.0     Winter     0-360   10011001  -1.30  0.043 -9.000  0.020 -999.   21.     6.0
1.000  1.50  0.35   0.50  10.0  310.0   2.0
  0.10754E-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
  0.10661E-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
  0.10569E-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
0.10479E-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
0.10390E-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
0.10302E-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
0.10216E-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
0.10131E-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
0.10047E-01 4125.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.99642E-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
0.98827E-02 4175.00 0.00 25.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.98023E-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
0.97230E-02 4225.00 0.00 5.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.96448E-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
0.95678E-02 4275.00 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
0.94917E-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
0.94168E-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
0.93428E-02 4350.00 0.00 10.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.92699E-02 4375.00 0.00 10.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.91979E-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
0.91269E-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
0.90568E-02 4449.99 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
0.89876E-02 4475.00 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
0.89194E-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
0.88521E-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
0.87856E-02 4550.00 0.00 15.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.87200E-02 4575.00 0.00 20.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.86552E-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
0.85913E-02 4625.00 0.00 25.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.85282E-02 4650.00 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
0.84658E-02 4675.00 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
0.84043E-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
0.83435E-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
0.82835E-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
0.82243E-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
0.81657E-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
0.81079E-02 4825.00 0.00 15.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.80508E-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
0.79944E-02 4875.00 0.00 30.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.79386E-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
0.78836E-02 4924.99 0.00 15.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.78292E-02 4950.00 0.00 5.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.77754E-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
0.77223E-02 5000.00 0.00 5.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0

Start date and time 09/02/21 17:04:52

AERSCREEN 21112

2021.09.02_901SBRANDGLENDALE_AERSCREEN

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

	METRIC	ENGLISH
** AREADATA **	----------	----------
Emission Rate:	0.137E-03 g/s	0.109E-02 lb/hr
Area Height:	3.00 meters	9.84 feet
Area Source Length:	123.68 meters	405.77 feet
Area Source Width:	61.84 meters	202.89 feet
Vertical Dimension:	1.50 meters	4.92 feet
Model Mode:	URBAN	
Population:	200232	
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:

2021.09.02_901SBrandGlendale_AERSCREEN_Operations.out

*** AERSCREEN Run is Ready to Begin

No terrain used, AERMAP will not be run

****

SURFACE CHARACTERISTICS & MAKEMET

Obtaining surface characteristics...

Using AERMET seasonal surface characteristics for Urban with Average Moisture

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

Creating met files aerscreen_01_01.sfc & aerscreen_01_01.pfl

Creating met files aerscreen_02_01.sfc & aerscreen_02_01.pfl

Creating met files aerscreen_03_01.sfc & aerscreen_03_01.pfl

Creating met files aerscreen_04_01.sfc & aerscreen_04_01.pfl

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

FLOWSECTOR started 09/02/21 17:07:09

****

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 09/02/21 17:07:18

REFINE       started 09/02/21 17:07:18

 AERMOD Finishes Successfully for REFINE stage 3 Winter sector   0

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

REFINE ended 09/02/21 17:07:19

****

AERSCREEN Finished Successfully

With no errors or warnings

Check log file for details

****

Ending date and time 09/02/21 17:07:21

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
0.34680E+00	1.00	0.00	0.0	Winter	0-360	10011001	-1.30	0.043	-9.000	0.020	-999.	21.	6.0	1.000	1.50	0.35	0.50	10.0	310.0	2.0
0.39934E+00	25.00	0.00	0.0	Winter	0-360	10011001	-1.30	0.043	-9.000	0.020	-999.	21.	6.0	1.000	1.50	0.35	0.50	10.0	310.0	2.0
0.44315E+00	50.00	0.00	0.0	Winter	0-360	10011001	-1.30	0.043	-9.000	0.020	-999.	21.	6.0	1.000	1.50	0.35	0.50	10.0	310.0	2.0
* 0.45959E+00	63.00	0.00	0.0	Winter	0-360	10011001	-1.30	0.043	-9.000	0.020	-999.	21.	6.0	1.000	1.50	0.35	0.50	10.0	310.0	2.0
0.38301E+00	75.00	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
0.23269E+00	100.00	0.00	0.0	Winter	0-360	10011001	-1.30	0.043	-9.000	0.020	-999.	21.	6.0	1.000	1.50	0.35	0.50	10.0	310.0	2.0
0.16941E+00	125.00	0.00	0.0	Winter	0-360	10011001	-1.30	0.043	-9.000	0.020	-999.	21.	6.0	1.000	1.50	0.35	0.50	10.0	310.0	2.0
0.13105E+00	150.00	0.00	0.0	Winter	0-360	10011001	-1.30	0.043	-9.000	0.020	-999.	21.	6.0	1.000	1.50	0.35	0.50	10.0	310.0	2.0
0.10558E+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
0.87697E-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
0.74495E-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
0.64413E-01	250.00	0.00	0.0	Winter	0-360	10011001	-1.30	0.043	-9.000	0.020	-999.	21.	6.0	1.000	1.50	0.35	0.50	10.0	310.0	2.0
0.56492E-01	275.00	0.00	0.0	Winter	0-360	10011001	-1.30	0.043	-9.000	0.020	-999.	21.	6.0	1.000	1.50	0.35	0.50	10.0	310.0	2.0
0.50095E-01	300.00	0.00	0.0	Winter	0-360	10011001	-1.30	0.043	-9.000	0.020	-999.	21.	6.0	1.000	1.50	0.35	0.50	10.0	310.0	2.0
0.44897E-01	325.00	0.00	0.0	Winter	0-360	10011001	-1.30	0.043	-9.000	0.020	-999.	21.	6.0	1.000	1.50	0.35	0.50	10.0	310.0	2.0
0.40555E-01	350.00	0.00	0.0	Winter	0-360	10011001	-1.30	0.043	-9.000	0.020	-999.	21.	6.0	1.000	1.50	0.35	0.50	10.0	310.0	2.0
0.36895E-01	375.00	0.00	0.0	Winter	0-360	10011001	-1.30	0.043	-9.000	0.020	-999.	21.	6.0	1.000	1.50	0.35	0.50	10.0	310.0	2.0
0.33764E-01	400.00	0.00	0.0	Winter	0-360	10011001	-1.30	0.043	-9.000	0.020	-999.	21.	6.0	1.000	1.50	0.35	0.50	10.0	310.0	2.0
0.31076E-01	425.00	0.00	0.0	Winter	0-360	10011001	-1.30	0.043	-9.000	0.020	-999.	21.	6.0	1.000	1.50	0.35	0.50	10.0	310.0	2.0
0.28739E-01	450.00	0.00	0.0	Winter	0-360	10011001	-1.30	0.043	-9.000	0.020	-999.	21.	6.0	1.000	1.50	0.35	0.50	10.0	310.0	2.0
0.26677E-01	475.00	0.00	0.0	Winter	0-360	10011001	-1.30	0.043	-9.000	0.020	-999.	21.	6.0	1.000	1.50	0.35	0.50	10.0	310.0	2.0
0.24864E-01	500.00	0.00	0.0	Winter	0-360	10011001	-1.30	0.043	-9.000	0.020	-999.	21.	6.0	1.000	1.50	0.35	0.50	10.0	310.0	2.0
0.23256E-01	525.00	0.00	0.0	Winter	0-360	10011001	-1.30	0.043	-9.000	0.020	-999.	21.	6.0	1.000	1.50	0.35	0.50	10.0	310.0	2.0
0.21824E-01	550.00	0.00	0.0	Winter	0-360	10011001	-1.30	0.043	-9.000	0.020	-999.	21.	6.0	1.000	1.50	0.35	0.50	10.0	310.0	2.0
0.20540E-01	575.00	0.00	0.0	Winter	0-360	10011001	-1.30	0.043	-9.000	0.020	-999.	21.	6.0	1.000	1.50	0.35	0.50	10.0	310.0	2.0
0.19378E-01	600.00	0.00	0.0	Winter	0-360	10011001	-1.30	0.043	-9.000	0.020	-999.	21.	6.0							

1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.18327E-01 625.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.17371E-01 650.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.16493E-01 675.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.15690E-01 700.00 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
0.14953E-01 725.00 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
0.14276E-01 750.00 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
0.13649E-01 775.00 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
0.13070E-01 800.00 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
0.12532E-01 825.00 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
0.12031E-01 850.00 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
0.11565E-01 875.00 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
0.11129E-01 900.00 0.00 5.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.10720E-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
0.10338E-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
0.99791E-02 975.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.96411E-02 1000.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.93227E-02 1025.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.90223E-02 1050.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.87374E-02 1075.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.84673E-02 1100.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.82115E-02 1125.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.80031E-02 1150.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.77702E-02 1175.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.75489E-02 1200.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.73383E-02 1225.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.71376E-02 1250.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.69463E-02 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
0.67636E-02 1300.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.65892E-02 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
0.64224E-02 1350.00 0.00 5.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.62627E-02 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
0.61098E-02 1400.00 0.00 5.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.59633E-02 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
0.58227E-02 1450.00 0.00 5.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.56878E-02 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
0.55582E-02 1500.00 0.00 5.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.54336E-02 1525.00 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
0.53138E-02 1550.00 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
0.51985E-02 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
0.50875E-02 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
0.49805E-02 1625.00 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
0.48773E-02 1650.00 0.00 5.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.47778E-02 1675.00 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
0.46818E-02 1700.00 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
0.45890E-02 1725.00 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
0.44994E-02 1750.00 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
0.44128E-02 1775.00 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
0.43290E-02 1800.00 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
0.42479E-02 1824.99 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
0.41695E-02 1850.00 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
0.40935E-02 1875.00 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
0.40198E-02 1900.00 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
0.39485E-02 1924.99 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
0.38793E-02 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
0.38122E-02 1975.00 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
0.37470E-02 2000.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.36838E-02 2025.00 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
0.36224E-02 2050.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.35627E-02 2075.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.35048E-02 2100.00 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
0.34484E-02 2125.00 0.00 5.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.33936E-02 2150.00 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
0.33403E-02 2175.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.32884E-02 2200.00 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
0.32379E-02 2225.00 0.00 5.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.31887E-02 2250.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.31408E-02 2275.00 0.00 5.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.30941E-02 2300.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.30487E-02 2325.00 0.00 5.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.30043E-02 2350.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.29611E-02 2375.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.29190E-02 2400.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.28778E-02 2425.00 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
0.28377E-02 2449.99 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
0.27985E-02 2475.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.27603E-02 2500.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.27229E-02 2525.00 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
0.26864E-02 2550.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.26508E-02 2575.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.26159E-02 2600.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.25819E-02 2625.00 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
0.25486E-02 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
0.25160E-02 2675.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.24842E-02 2700.00 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
0.24531E-02 2725.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.24226E-02 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
0.23927E-02 2775.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.23635E-02 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
0.23350E-02 2825.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.23070E-02 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
0.22795E-02 2875.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.22527E-02 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
0.22264E-02 2925.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.22006E-02 2950.00 0.00 5.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.21753E-02 2975.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.21505E-02 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
0.21262E-02 3025.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.21024E-02 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
0.20791E-02 3075.00 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
0.20561E-02 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
0.20337E-02 3125.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.20116E-02 3150.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.19900E-02 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
0.19687E-02 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
0.19479E-02 3225.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.19274E-02 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
0.19073E-02 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
0.18875E-02 3300.00 0.00 30.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0

1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.18681E-02 3325.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.18491E-02 3350.00 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
0.18304E-02 3375.00 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
0.18120E-02 3400.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.17939E-02 3425.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.17761E-02 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
0.17587E-02 3475.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.17415E-02 3500.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.17246E-02 3525.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.17080E-02 3550.00 0.00 25.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.16917E-02 3575.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.16756E-02 3600.00 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
0.16598E-02 3625.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.16443E-02 3650.00 0.00 25.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.16290E-02 3675.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.16140E-02 3700.00 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
0.15992E-02 3724.99 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
0.15846E-02 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
0.15703E-02 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
0.15561E-02 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
0.15422E-02 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
0.15286E-02 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
0.15151E-02 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
0.15018E-02 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
0.14887E-02 3925.00 0.00 5.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.14759E-02 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
0.14632E-02 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
0.14507E-02 4000.00 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
0.14384E-02 4025.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
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0.14262E-02 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
0.14143E-02 4075.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
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0.14025E-02 4100.00 0.00 10.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.13909E-02 4125.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.13794E-02 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
0.13681E-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
0.13570E-02 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
0.13460E-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
0.13352E-02 4250.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
1.000 1.50 0.35 0.50 10.0 310.0 2.0
0.13245E-02 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
0.13140E-02 4300.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
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0.13036E-02 4325.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
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0.12934E-02 4350.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
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0.12833E-02 4375.00 0.00 5.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
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0.12733E-02 4400.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
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0.12635E-02 4425.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
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0.12538E-02 4450.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
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0.12442E-02 4475.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
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0.12348E-02 4500.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
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0.12255E-02 4525.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
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0.12163E-02 4550.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
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0.12072E-02 4575.00 0.00 20.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
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0.11982E-02 4600.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
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0.11894E-02 4625.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
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0.11806E-02 4650.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0

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0.11720E-02 4675.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
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0.11635E-02 4700.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
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0.11467E-02 4750.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
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0.11385E-02 4775.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
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0.11305E-02 4800.00 0.00 5.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
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0.11224E-02 4825.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
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0.11145E-02 4850.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
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0.11067E-02 4875.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
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0.10990E-02 4900.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
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0.10914E-02 4925.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
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0.10839E-02 4950.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
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0.10764E-02 4975.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
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0.10691E-02 5000.00 0.00 0.0 Winter 0-360 10011001 -1.30 0.043 -9.000 0.020 -999. 21. 6.0
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Matthew F. Hagemann, P.G.,* C.Hg**

Geologic and Hydrogeologic Characterization, Investigation and Remediation Strategies

Expert Testimony

Industrial Stormwater Compliance

CEQA Review

Professional Certifications:

*Professional Geologist
**Certified Hydrogeologist

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

Professional Experience:

30 years of experience in environmental policy, contaminant assessment and remediation, stormwater compliance, and CEQA review. Spent nine years with the U.S. EPA in the Resource Conservation Recovery Act (RCRA) and

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

Positions held include:

Government:

- Senior Science Policy Advisor and Hydrogeologist, U.S. Environmental Protection Agency (1989–1998);
- Hydrogeologist, National Park Service, Water Resources Division (1998 – 2000);
- Geologist, U.S. Forest Service (1986 – 1998)

Educational:

- Geology Instructor, Golden West College, 2010 – 2104, 2017;
- Adjunct Faculty Member, San Francisco State University, Department of Geosciences (1993 – 1998);
- Instructor, College of Marin, Department of Science (1990 – 1995);

Private Sector:

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

Senior Regulatory and Litigation Support Analyst:

With SWAPE, responsibilities have included:

- Lead analyst and testifying expert, for both plaintiffs and defendants, in the review of over 300 environmental impact reports and negative declarations since 2003 under CEQA that identify significant issues with regard to

hazardous waste, water resources, water quality, air quality, greenhouse gas emissions, and geologic hazards.

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

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

- Senior author of a report on the extent of perchlorate contamination that was used in testimony by the former U.S. EPA Administrator and General Counsel.
- Senior researcher in the development of a comprehensive, electronically interactive chronology of MTBE use, research, and regulation.
- Senior researcher in the development of a comprehensive, electronically interactive chronology of perchlorate use, research, and regulation.
- Senior researcher in a study that estimates nationwide costs for MTBE remediation and drinking water treatment, results of which were published in newspapers nationwide and in testimony against provisions of an energy bill that would limit liability for oil companies.
- Research to support litigation to restore drinking water supplies that have been contaminated by MTBE in California and New York.
- Lead author for a multi-volume remedial investigation report for an

operating school in Los Angeles that met strict 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, an Orange County-based not-for-profit water-quality organization, 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, prepared issue papers in the areas of treatment and disinfection of wastewater and control of the discharge of grease to sewer systems. Actively participated in the development of countywide water quality permits for the control of urban runoff and permits for the discharge of wastewater. 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, led investigations to characterize and cleanup closing military bases, including Mare Island Naval Shipyard, Hunters Point Naval Shipyard, Treasure Island Naval Station, Alameda Naval Station, Moffett Field, Mather Army Airfield, and Sacramento Army Depot. Specific activities included:

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

At the request of the State of Hawaii, developed a methodology to determine the vulnerability of groundwater to contamination on the islands of Maui and Oahu. Used

analytical models and a GIS to show zones of vulnerability, and the results were adopted and published by the State of Hawaii and County of Maui.

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

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

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

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

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

- Applied pertinent laws and regulations including CERCLA, RCRA, NEPA, NRDA, and the Clean Water Act to control military, mining, and landfill contaminants.
- Conducted watershed-scale investigations of contaminants at parks, including Yellowstone and Olympic National Park.
- Identified high-levels of perchlorate in soil adjacent to a national park in New Mexico and advised park superintendent on appropriate response actions under CERCLA.
- Served as a Park Service representative on the Interagency Perchlorate Steering Committee, a national workgroup.

- Developed a program to conduct environmental compliance audits of all National Parks while serving on a national workgroup.
- Co-authored two papers on the potential for water contamination from the operation of personal watercraft and snowmobiles, these papers serving as the basis for the development of nation- wide policy on the use of these vehicles in National Parks.
- Contributed to the Federal Multi-Agency Source Water Agreement under the Clean Water Action Plan.

Policy:

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

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

Geology:

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

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

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

hazardous waste site in eastern Oregon. Duties included the following:

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

Teaching:

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

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

Invited Testimony, Reports, Papers and Presentations:

Hagemann, M.F., 2008. Disclosure of Hazardous Waste Issues under CEQA. Presentation to the PublicEnvironmental 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 andPublic 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 atschools in Southern California, Los Angeles.

Brown, A., Farrow, J., Gray, A. and **Hagemann, M.**, 2004. An Estimate of Costs to Address MTBEReleases from Underground Storage Tanks and the Resulting Impact to Drinking Water Wells.
Presentation to the Ground Water and Environmental Law Conference, National

GroundwaterAssociation.

Hagemann, M.F., 2004. Perchlorate Contamination of the Colorado River and Impacts to Drinking Waterin 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 Waterin 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 atribal EPA meeting, Pechanga, CA.

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

Hagemann, M.F., 2003. Impact of Perchlorate on the Colorado River and Associated Drinking WaterSupplies. 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. Invitedpresentation to the California Assembly Natural Resources Committee.

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

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

Hagemann, M.F., 2002. A Chronology of MTBE in Groundwater and an Estimate of Costs to AddressImpacts 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 andState Underground Storage Tank Program managers.

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

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 StorageTanks. Unpublished report.

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

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

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

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

Hagemann, M.F., and Gill, M., 1996, Impediments to Intrinsic Remediation, Moffett Field Naval AirStation, 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, Airand Waste Management Association Publication VIP-61.

Hagemann, M.F., 1994. Groundwater Ch ar ac te r i z a t i o n and Cl ean up a t Closing Military Basesin 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 ofPrevention... 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.

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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.

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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 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 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

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,; 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

Meridian Consultants

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Date: June 14, 2022

To: City of Glendale
Planning Division
633 E. Broadway, Room 103
Glendale, CA 91206

From: Christ Kirikian
Principal | Director of Air Quality & Acoustics

Subject: Response to Lozeau Drury LLP letter dated September 7, 2021
RE: Comment on the Mitigated Negative Declaration, PPRP 2004082 (901-919 South Brand Boulevard)

This memorandum is being provided at the City's request to address the comments from the Lozeau Drury LLP letter (dated September 7, 2021) regarding the Initial Study and Mitigated Negative Declaration (IS/MND) for the 901-919 South Brand Boulevard Project in the City of Glendale. Meridian Consultants prepared a supplemental air quality/greenhouse gas study dated June 2022 (Supplemental AQ/GHG Study) with updated model inputs and provides additional justification for those values. The following provides responses to the summary of comments related to air quality and greenhouse gas provided in the letter.

Comment A: The IS/MND Failed to Prepare a Phase I Environmental Site Assessment to Estimate the Project Site's Hazardous Substances

The commenter incorrectly alleges a Phase I Environmental Site Assessment (ESA) is required for this Project and the proposed development. The commenter incorrectly offers opinions that aren't supported by the guidelines, such as stating that "the preparation of a Phase I ESA is <u>often undertaken</u> in the preparation of CEQA documents to identify hazardous waste issues." It is important to note CEQA and the CEQA Guidelines do not require the preparation of Phase I ESAs. Therefore, the City's IS/MND meets the applicable CEQA standard by determining if the site is included on the government list of hazardous material sites specifically identified in the CEQA Initial Study checklist. Based on a review of the California Department of Toxic Substances Control "Envirostor Database", no known hazardous waste sites are located on the Project site or within the immediate vicinity.[1] As such, preparation of a Phase I ESA would not be required. No changes to the City's IS/MND are required.

1 State of California, Department of Toxic Substances Control, EnviroStor, "Hazardous Waste and Substances Site List," accessed June 2022, https://www.envirostor.dtsc.ca.gov/.

Comment B: The IS/MND Relied on Unsubstantiated Input Parameters to Estimate Project Emissions and Thus the Project May Result in Significant Air Quality Impacts

The commenter alleges that the MND underestimated the Project's construction and operational emissions and the values input into the model were inconsistent with the information provided in the MND. More specifically, the commenter alleges the following values were either inconsistent or otherwise unjustified: (1) land use size; (2) unsubstantiated reduction to default acres of grading values; and (3) failure to model all required demolition.

In regards to land use size, the commenter alleges the land use size for the proposed parking structure was underestimated by 59 square feet. As such, the Supplemental AQ/GHG Study updated the land use size to 27,557 square feet reflecting the latest site plans. Additionally, the commenter alleges the grading values were unsubstantially reduced, thus underestimating construction-related emissions. The Supplemental AQ/GHG Study updated the model inputs to the default values for acres of grading as the commenter suggests and inputted 1,750 cubic yards of export during the grading phase. Lastly, the commenter alleges the model input should have included 34,661 square feet of demolition, even though the MND assumes 105 total haul trips. As such, the Supplemental AQ/GHG study updated the model to include removal of the at-grade asphalt parking lot and the accessory building for a total of 34,661 square feet of removal. This update results in 158 total haul trips as the commenter suggests.

With the updated inputs mentioned above, the Supplemental AQ/GHG Study concluded impacts related to construction would still remain less than significant (refer to **Table 11: Maximum Construction Emissions**). It is important to note, the emissions provided in **Table 11** of the Supplemental AQ/GHG Study do not include regulatory compliance measures such as construction equipment controls or control efficiency of PM10 (dust control measures per SCAQMD Rule 403) to provide a conservative analysis. Based on this, construction emissions for the proposed development would be further reduced than what is presented in **Table 11** and emissions would not exceed regional concentration thresholds. As such, no changes to the City's IS/MND are required.

Comment C: There is Substantial Evidence of a Fair Argument that the Project May Have a Significant Health Impact as a Result of Diesel Particulate Emissions

The commenter alleges that the IS/MND fails to discuss health risk impacts associated with the Project's construction-related and operational related toxic air contaminants (TACs).

The IS/MND and the Supplemental AQ/GHG Study evaluate both construction and operational emissions that would be generated by the proposed Project and could affect nearby existing sensitive receptors. Under SCAQMD standards and guidelines, construction based HRAs are not required for this type of development project. Instead, as directed by SCAQMD, the local significance thresholds (LSTs) are used to evaluate potential health impacts from particulate matter emissions to sensitive receptors in the

project's vicinity from project construction. As shown in Supplemental AQ/GHG Study (refer to **Table 13: Localized Construction and Operational Emissions**) local construction and operational related emissions would not exceed SCAQMD LST thresholds, and therefore, would not create any significant health risks to nearby sensitive receptors.

Moreover, an HRA analyzing the project's construction emissions of diesel particulate matter is not warranted for this project. The primary purpose of an HRA is to determine long-term health risks, such as cancer risks over, for example, a 30-year residency or 70-year lifetime. As discussed in the IS/MND and the Supplemental AQ/GHG Study (refer to **Table 9: Project Construction Schedule**), construction is anticipated to last less than 1 year (approximately 11 months). Exposure of such duration would not create long-term health effects to adjacent receptors. Additionally, the City of Glendale follows SCAQMD guidance for air quality analysis, which does not currently have any published guidance on addressing construction health risks from diesel exhaust.

Furthermore, as stated in the IS/MND and the Supplemental AQ/GHG Study, the City's Traffic Engineer determined no significant increase in traffic could occur as a result of the Project because the proposed use is a parking structure for the current car inventory and the car sales/service floor area will remain the same. The area of parking garages is not considered for purposes of trip generation.

As such, the Project would not generate a significant impact as a result of diesel particulate emissions and no changes to the City's IS/MND are required.

Comment D: The IS/MND Failed to Adequately Evaluate Energy Impacts

The commenter asserts the City's IS/MND does not provide adequate analysis related to energy. It is important to note, the City has not adopted a numerical significance threshold for assessing impacts related to energy emissions. Assessing the significance of a project's contribution involves the evaluation of project consistency with applicable emission reduction strategies and goals. The evaluation of consistency with plans is the sole basis for determining the significance of the Project's energy related impacts on the environment.

The Project currently meets the applicable criteria from the Greener Glendale Plan and exceeds current standards as the site currently houses three solar panel structures. Development of the site will result in demolition of the accessory building and the existing solar panel structures will be removed and relocated to the rooftop of the new parking structure. Therefore, it is not anticipated that the Project would result in increase energy consumptions that would result in significant impacts. Furthermore, the Supplemental AQ/GHG Study provides analysis describing the extend the Project complies with the regulations and policies outlined in the City's Greener Glendale Plan, and the City's South Glendale Community Plan EIR. As discussed in **Table 15: Project Consistency with Greener Glendale Plan**, the Project would not conflict with the 12 measures listed, as the Greener Glendale Plan incorporates the mandatory Green Building Standards for new construction projects.

The Project would not generate a significant impact as a result of energy emissions and no changes to the City's IS/MND are required.

Comment E: The IS/MND Failed to Adequately Analyze the Project's Greenhouse Gas Impacts and Thus the Project May Result in Significant Greenhouse Gas Emissions

The City has not adopted a numerical significance threshold for assessing impacts related to GHG emissions. Nor have SCAQMD, OPR, CARB, CAPCOA, or any other state or regional agency adopted a numerical significance threshold for assessing GHG emissions that is applicable to the Project. Assessing the significance of a project's contribution to cumulative global climate change involves: (1) developing pertinent inventories of GHG emissions, and (2) considering project consistency with applicable emission reduction strategies and goals. This evaluation of consistency with such plans is the sole basis for determining the significance of the Project's GHG-related impacts on the environment.

The Supplemental AQ/GHG Study provides analysis describing the extend the Project complies with the regulations and policies outlined in the City's Greener Glendale Plan, and the City's South Glendale Community Plan EIR. As discussed in **Table 15: Project Consistency with Greener Glendale Plan**, the Project would not conflict with the 12 measures listed, as the Greener Glendale Plan incorporates the mandatory Green Building Standards for new construction projects. It is important to note, the Project currently complies with the Greener Glendale Plan as the existing structures currently incorporate solar panels, which would be relocated to the rooftop of the new parking structure. Furthermore, the Project would not generate additional trips as the City's Traffic Engineer determined no significant increase in traffic could occur as a result of the Project as the current car inventory and car sales/service floor area would remain unchanged. The area of parking garages is not considered for purposes of trip generation. Therefore, the Project would not result in significant increases in greenhouse gas emissions than what currently exists today, as the proposed new structure would be required to adhere to the mandatory Green Building Standards.

The commenter asserts that the Project should implement additional mitigation measures to reduce the Project's GHG emissions to less than significant. The list of potential measures suggested by the commenter is simply the full list of potential GHG-reducing measures identified in the SCAG RTP/SCS 2020-2045 plan from which lead agencies are encouraged to select the measures they deem to be applicable and feasible for a particular project. However, described in the Supplemental AQ/GHG Study, the Project would not result in significant impacts related to greenhouse gas emissions, thus the mitigation measures would not be required.

The Project would not generate a significant impact as a result of greenhouse gas emissions and no changes to the City's IS/MND are required.

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Date: June 14, 2022

To: City of Glendale
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From: Christ Kirikian
Principal | Director of Air Quality & Acoustics

Subject: Response to Lozeau Drury LLP letter dated May 18, 2022
RE: Appeal Comment on the Mitigated Negative Declaration, PPRP 2004082 (901-919 South Brand Boulevard), May 18, 2022 Planning Commission, Agenda Item 7.a.

This memorandum is being provided at the City's request to address the comments from the Lozeau Drury LLP letter (dated May 18, 2022) regarding the Initial Study and Mitigated Negative Declaration (IS/MND) for the 901-919 South Brand Boulevard Project in the City of Glendale. Meridian Consultants prepared a supplemental air quality/greenhouse gas study dated June 2022 (Supplemental AQ/GHG Study) and a supplemental noise study dated June 2022 (Supplemental Noise Study) with updated model inputs and provides additional justification for those values. The following provides responses to the summary of comments provided in the letter.

Comment A: There is Substantial Evidence of a Fair Argument that the Project May Have a Significant Health Impact as a Result of Diesel Particulate Emissions

The commenter alleges that the IS/MND fails to discuss health risk impacts associated with the Project's construction-related and operational related toxic air contaminants (TACs).

The IS/MND and the Supplemental AQ/GHG Study evaluate both construction and operational emissions that would be generated by the proposed Project and could affect nearby existing sensitive receptors. Under SCAQMD standards and guidelines, construction based HRAs are not required for this type of development project. Instead, as directed by SCAQMD, the local significance thresholds (LSTs) are used to evaluate potential health impacts from particulate matter emissions to sensitive receptors in the project's vicinity from project construction. As shown in Supplemental AQ/GHG Study (refer to **Table 13: Localized Construction and Operational Emissions**) local construction and operational related emissions would not exceed SCAQMD LST thresholds, and therefore, would not create any significant health risks to nearby sensitive receptors.

Moreover, an HRA analyzing the project's construction emissions of diesel particulate matter is not warranted for this project. The primary purpose of an HRA is to determine long-term health risks, such

as cancer risks over, for example, a 30-year residency or 70-year lifetime. As discussed in the IS/MND and the Supplemental AQ/GHG Study (refer to **Table 9: Project Construction Schedule**), construction is anticipated to last less than 1 year (approximately 11 months). Exposure of such duration would not create long-term health effects to adjacent receptors. Additionally, the City of Glendale follows SCAQMD guidance for air quality analysis, which does not currently have any published guidance on addressing construction health risks from diesel exhaust.

Furthermore, as stated in the IS/MND and the Supplemental AQ/GHG Study, the City's Traffic Engineer determined no significant increase in traffic could occur as a result of the Project because the proposed use is a parking structure for the current car inventory and the car sales/service floor area will remain the same. The area of parking garages is not considered for purposes of trip generation.

As such, the Project would not generate a significant impact as a result of diesel particulate emissions and no changes to the City's IS/MND are required.

Comment B: There is Substantial Evidence of a Fair Argument that the Project May Have Adverse Noise Impacts that the MND Failed to Address

The commenter asserts that the MND lacks any discussion of the thresholds uses to determine significance and does not give information on the thresholds that would actually establish whether noise and vibration impacts would be significant. The City's General Plan and Municipal Code do not establish numeric acceptable source noise levels or noise level increases at potentially affected receivers. Section 8.36.080 of the City's Municipal Code regulates construction noise and specifies restrictions from work occurring within certain time periods. To evaluate whether the Project will generate a substantial periodic increase in short-term noise levels at off-site sensitive receiver locations, a construction-related noise level threshold is adopted from the Criteria for Recommended Standard: Occupational Noise Exposure prepared by the National Institute for Occupational Safety and Health (NIOSH). A division of the U.S. Department of Health and Human Services, NIOSH identifies a noise level threshold based on the duration of exposure to the source. The construction related noise level threshold starts at 85 dBA for more than eight hours per day, and for every 3 dBA increase, the exposure time is cut in half. This results in noise level thresholds of 88 dBA for more than four hours per day, 92 dBA for more than one hour per day, 96 dBA for more than 30 minutes per day, and up to 100 dBA for more than 15 minutes per day. For the purposes of the Supplemental Noise Study, the lowest, more conservative construction noise level threshold of 85 dBA Leq-8hour is used as an acceptable threshold for construction noise at the nearby sensitive receiver locations. Since this construction-related noise level threshold represents the energy average of the noise source over a given time period, they are expressed as Leq noise levels. Therefore, the noise level threshold of 85 dBA Leq-8hour over a period of eight hours or more is used in the Supplemental Noise Study to evaluate the potential Project-related construction noise level impacts at the nearby sensitive receiver locations.

As shown in **Table 6: Maximum Noise Impacts Associated with On-Site Construction Activities** of the Supplemental Noise Study, noise levels due to construction would not exceed 85 dBA (Leq-8hour)

threshold at the nearby sensitive uses. Therefore, no mitigation measures would be required to reduce construction noise levels to less than significant. Moreover, the Project would be required to adhere to Section 8.36.290(K) of the GMC, which requires noise limitations to be implemented during construction to the extent feasible. Noise limitations that are commonly used include the use of mufflers, shields, sound barriers and/or any other noise reduction device or techniques during the operation of the equipment. More specifically, using optimal muffler systems on all equipment would reduce construction noise levels by 10 dBA or more.[1] Temporary abatement techniques such as the use of a noise barrier can achieve a 5-dBA noise level reduction when it is tall enough to break the line-of-sight to the receiver. Modifications such as dampening of metal surfaces or the redesign of a particular piece of equipment can achieve noise reduction of up to 5 dBA.[2] Moving stationary equipment away from sensitive receptors will reduce noise levels at the receptor as every doubling of distance will reduce noise by 4 to 6 dBA. As such, adherence to the GMC would further reduce construction noise levels at all nearby sensitive uses. Moreover, the Project would comply with the GMC as it relates to construction equipment by ensuring that the operation of noise generating construction equipment would not occur between the hours of 7:00 PM on one day and 7:00 AM of the next day, or from 7:00 PM on Saturday to 7:00 AM on Monday, or from 7:00 PM preceding a holiday. Compliance with the above practices would ensure construction noise levels are further reduced to the maximum extent feasible.

There are no adopted City standards or thresholds of significance for vibration. Section 8.36.210 of the City's Municipal Code prohibits vibration to exceed the perception threshold at or beyond the property boundary of the source or at 150 feet from the source if on a public space or public right of way, however does not define the level of vibration that is deemed perceptible by an individual and does not establish maximum allowable vibration levels. The FTA has also adopted standards associated with human annoyance for groundborne vibration impacts for the following three-land use categories: (1) Category 1, High Sensitivity; (2) Category 2, Residential; and (3) Category 3, Institutional.

For purposes of the Supplemental Noise Study, the human annoyance threshold for infrequent construction vibration events is 80 VdB for residences and buildings where people normally sleep and 83 VdB for institutional land uses with primarily daytime use. As shown in **Table 7: On-Site Construction Vibration Impacts** the forecasted vibration levels due to on-site construction activities would not exceed the human annoyance threshold for infrequent events of 80 VdB for the nearby residential receptors surrounding the Project area during construction. As such, impacts related to human annoyance from on-site construction vibration would not be considered significant.

As such, the Project would not generate a significant impact as a result of construction noise and vibration and no changes to the City's IS/MND are required.

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1 FHWA, *Special Report—Measurement, Prediction, and Mitigation*, updated June 2017, https://www.fhwa.dot.gov/Environment/noise/construction_noise/special_report/hcn04.cfm, Accessed January 2021.

2 FHWA, *Special Report—Measurement, Prediction, and Mitigation*, updated June 2017, accessed July 2019, https://www.fhwa.dot.gov/Environment/noise/construction_noise/special_report/hcn04.cfm.