Michael Hendrix Consulting

MEMORANDUM

DATE: June 28, 2024

TO: J.J. Jenkins, NP Banning Industrial, LLC

FROM: Michael Hendrix

SUBJECT: Sunset Crossroads Supplemental Greenhouse Gas (GHG) Emissions Assessment.

Michael Hendrix Consulting (MHC) is pleased to provide an updated supplement of the GHG Analysis Technical Report dated October 20, 2023.

1.1 PROJECT OVERVIEW

A Draft Environmental Impact Report (DEIR) for the Project was released for public review on December 15, 2023. The city has received comments on the DEIR from the South Coast Air Quality Management District (SCAQMD), dated January 30, 2024 and from the California Air Resources Board (CARB), dated January 30, 2024.

The purpose of this supplemental assessment is to address the following two specific comments made by both SCAQMD and CARB:

1. The truck trip lengths are potentially understated as the modeling appears to suggest that 59% of the truck traffic would travel 40 miles and 41% of the truck traffic would travel a distance of 6.9 miles.

2. Since the Project would include the potential for high cube cold storage uses, that emissions from Transport Refrigeration Units (TRUs) need to be analyzed.

The FEIR and associated appendices contain a response to all the additional comments from SCAQMD and CARB.

1.2 REVIEW OF THE DEIR

MHC has reviewed the DEIR and underlying technical Appendix C-1 and determined that the DEIR uses a 40-mile trip length for 59 percent of the trucks and a 6.9-mile trip length for the remainder (41 percent) of the trucks. The DEIR based this assumption on the fact that the large Class 8 Heavy

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Duty Trucks represent 59 percent of the total truck traffic[1] to the Project site and that approximately 41% of the truck traffic[2] associated with the Project would be smaller trucks and have a trip length consistent with the CalEEMod defaults.

A review of the DEIR confirms that emissions from TRUs are not explicitly included, however it should be noted that TRU regulations require electrification of TRUs to phase over the next several years and the Project is providing plug-ins at loading docks to limit the emission from TRUs. As such, TRU emissions, even if they were included, are not expected to generate a significant amount of emissions that would change the findings and conclusions of the DEIR.

1.3 SUPPLEMENTAL GHG ASSESSMENT

This assessment serves to provide additional technical analysis to fully respond to SCAQMD and CARBs concerns regarding assessment of Project GHG emissions. MHC utilized the CalEEMod input file that was included as part of the DEIR as the basis for this supplemental GHG assessment.

1.4 UPDATED CALEEMOD ASSESSMENT

As summarized in attachment B to this memorandum, an updated CalEEMod run was prepared to address both the SCAQMD and CARB comments related to truck trip length. This updated CalEEMod run was used to update the GHG emissions analysis and followed the following steps:

First, the trip length for trucks by axle type was determined based on SCAQMD's published data from the Warehouse Actions and Investments to Reduce Emissions (WAIRE) Implementation Guidelines[3]. Based on the WAIRE Implementation Guidelines (see Table 4, Page 8), average truck trip lengths were separated into three categories: Class 2b-3 (2-axle), Class 4-7 (3-axle), and Class 8 (4+-axle), as summarized on Table A below.

Table A: Average Trip Length from SCAQMD WAIRE Implementation Guide

Truck Class	Average Trip Length (Miles)
Class 2b-3 (2axle trucks)	15.3
Class 4-7 (3 axle trucks)	14.2
Class 8 (4+ axle trucks)	39.9

Source: SCAQMD 2021. Rule 2305 WAIRE Implementation Guidelines

[1] LSA. 2023. Draft Environmental Impact Report - Sunset Crossroads: SCH NO. 2021020011. Appendix B: Proposed Project Trip Generation to Appendix J-3: Sunset Crossroads Supplemental Traffic Assessment. December.

[2] Ibid.

[3] South Coast Air Quality Management District (SCAQMD). 2021. Rule 2305 Warehouse Indirect Source Rule. June. Website: www.aqmd.gov/docs/default-source/planning/fbmsm-docs/waire-implementation-guidelines.pdf (accessed April 2024). An attachment of the WAIRE Implementation Guidelines is appended to this assessment as Attachment "A".

The next step for updating the assessment was to determine a weighted average trip length based on the number of 2, 3, and 4+ axle trucks consistent with the traffic assessment for each of the industrial land use categories modeled in CalEEMod.

More specifically, the CalEEMod runs from the DEIR includes three primary land use categories input in CalEEMod for the industrial uses that generate truck trips, as follows:

1. Unrefrigerated Warehouse" which includes truck trips from the High-Cube Fulfillment, Warehousing, High-Cube Transload, and High Cube Parcel Hub land uses evaluated in the traffic assessment.

2. "Refrigerated Warehouse" which includes truck trips from the High-Cube Cold Storage use evaluated in the traffic assessment.

3. "General Heavy Industry" which includes truck trips from the General Heavy Industrial and General Light Industrial land use categories evaluated in the traffic assessment.

A summary of 2-, 3-, and 4+-axle trucks by modeled land use along with the calculated weighted trip length are summarized on Table B. The resulting weighted trip length was input in CalEEMod under the Non Res C-W category, with 100% of the trips assigned to the C-W category. Table C provides a summary of the updated Heavy-Duty Mobile Emissions resulting from the updated trip lengths assigned to the land uses compared to the Heavy-Duty Mobile emissions as disclosed in the DEIR. As shown on Table C, the incremental emissions that could occur based on the alternative calculation method recommended by SCAQMD would result in a moderate increase in GHG emissions. The analysis in the DEIR concludes that GHG emissions exceeded the 3,000 MT Threshold after mitigation and have a significant and unavoidable impact. Therefore, the moderate change in GHG emission does not cause a new significant impact that was not previously disclosed in the DEIR. The updated CalEEMod emissions outputs are summarized in Attachment B.

Table B: Long-Term Greenhouse Gas Emissions at Buildout

Land Use	2-axle trucks **(15.3 miles)**	3-axle trucks **(14.2 miles)**	4+ axle trucks **(39.9 miles)**	**Total Trucks**	Weighted Trip **Length (miles)**
Unrefrigerated Warehouse	231	253	1,348	1,832	33.25
Refrigerated Warehouse	86	28	134	248	28.47
General Heavy Industry	**16**	**18**	**52**	**86**	**29.94**

Source: Compiled by Urban Crossroads (April 2024).

Table C: Summary of Updated Heavy Duty Mobile Emissions

Source	GHG Emissions (MT/yr)
Updated Heavy-Duty Mobile Emissions	32,928.90
Heavy-Duty Mobile Emissions From DEIR	27,496.15
Net Change	5,432.75
Percentage Increase	19.76%

Source: Compiled by MHC (May 2024)

1.5 TRANSPORT REFRIGERATION UNITS

Both SCAQMD and CARB comment that TRU emissions should be included in the DEIR. As summarized in the OFFROAD Model Output in attachment A of the Supplemental Memorandum Regarding Operational Emissions from Transport Refrigeration Units (TRUs) and updated Health Risk Assessment for the Proposed Sunset Crossroads Specific Plan Project (May 14, 2024), which is attachment C to this memorandum, TRU emissions were conservatively calculated assuming all trucks accessing Buildings 5 and 6 (the buildings proposed as cold storage warehouse use) would include TRUs and could operate for up to 4 hours per day. This is a conservative assumption since the current CARB regulations require an increasing percentage of all TRU fleets within the State to transition to electric only, with a full phase out of diesel TRUs by 2030. A summary of the GHG TRU emissions is summarized on Table 4. As shown on Table 4, even with the conservative assumptions for TRUs associated with the Project, the incremental GHG emissions would be minimal (see Tables E and F below for comparison of total GHG emissions in the DEIR, with this update that includes TRU emissions). The TRU emissions and calculations from the Urban Crossroads memorandum are included in Attachment C.

Table D: TRU EMISSIONS

Source	GHG Emissions (MT/yr)
Truck TRUs	421.17

Source: Compiled by MHC (May 2024)

2.1 SUMMARY OF EMISSIONS WITH TRIP LENGTH AND TRU EMISSIONS UPDATES

With updated truck trip lengths based on the WAIRE Implementation Guidelines for truck trip l lengths and inclusion of TRU emissions in response to SCAQMD and CARB comments on the Draft EIR, the GHG emissions totals for the Project were updated based on the updated CalEEMod run for truck trip lengths and the updated calculations for TRU emissions as described in this memorandum.

A review of the Project Design Features (PDFs) and Mitigation Measures was completed focused on SCAQMD and CARB comments as well as current regulations. That review resulted in modifying the PDF for solar ready rooftops to include photovoltaic (PV) solar panels capable of generating at least 20 percent of anticipated commercial land use electricity consumption and the office space of the industrial land uses. Mitigation Measure AIR-1 and Mitigation Measure AIR-2 were modified as well.

Mitigation Measure AIR-1 now requires electric construction equipment when feasible, and Tier 4 equipment to be used only if electric equipment is unavailable. Mitigation Measure AIR-2 requires electric receptacles to be installed at the loading docks to accommodate electric TRUs. This aspect of Mitigation Measure AIR-2 was updated to include a requirement that at buildout 90 percent of TRUs are electric and all trucks are restricted to 3 minutes of idling while onsite. The full set of PDFs are listed in Section 2.2 with changes from the DEIR underlined to facilitate ease of the review. The full set of Mitigation Measures are provided in Section 2.3 with changes to Mitigation Measure AIR-1 and AIR-2 in underlined and ~~strikeout~~.

2.2 PROJECT DESIGN FEATURES (PDFs)

Because PDFs are incorporated into the design and construction or operational activities through conditions of approval, they do not constitute mitigation measures. The Proposed Project's Specific Plan, as updated, has a PDF requiring compliance with California Building Code Title 24, Part 6 solar requirements. Previously, for non-residential development, only solar ready roofs were required The following language represents current Title 24, Part 6 requirements which keep the Proposed Project compliant with Title 24, Part 6 requirements, and is the basis for the GHG analysis in this memorandum and will be added to the FEIR:

- All Commercial and Industrial buildings within the Development Project will have solar ready roofs, that includes roof vents and skylights spaced in a manner that allows the south facing roof areas sufficient space to install PV solar panels. In addition, all Commercial buildings shall install PV solar panels with the capacity to generate at least 20 percent of the Commercial buildings' expected electricity consumption. All Industrial buildings shall install PV solar panels with the capacity to generate the expected electricity consumption of the office space of the warehouses and otherwise comply with Title 24, Part 6. Electric conduit leading from the roof area to the electric control panels shall be installed and include electrical panels with sufficient capacity to accommodate PV solar.

2.3 PROJECT MITIGATION

The following provides the additional language changes pertinent to GHG reducing aspects of Mitigation Measure AIR-1 and Mitigation Measure AIR-2 shown in the FEIR.

Mitigation Measure AIR-1

Plans submitted for grading permit issuance and building permit issuance shall specify a designated area of the construction site where electric or non-diesel vehicles, equipment, and tools can be fueled or charged. The provision of temporary electric infrastructure for such purpose shall be approved by the utility provider, Banning Electric Utility (BEU). If BEU does not approve the installation of temporary power for this purpose, the establishment of a temporary electric charging area will not be required. If electric equipment will not be used on the construction site because the construction contractor(s) does not have such equipment in its fleet (as specified in this Mitigation Measure below), the establishment of a temporary electric charging area also will not be required. If the contractor(s) equipment fleet includes this equipment and BEU approval is secured, the temporary charging location shall be established upon issuance of grading permits and building permits.

If electric or non-diesel off-road trucks and construction support equipment, including but not limited to hand tools, forklifts, aerial lifts, materials lifts, hoists, pressure washers, plate compactors, and air compressors are available in the construction contractor's equipment fleet and can fulfill the construction requirements during the building, construction, paving, and architectural coating phases of Project construction, such equipment shall be used during on-site construction. This requirement shall be noted on plans submitted for building permit issuance.

~~During construction of the proposed Development Project~~ If electric or non-diesel off-road truck and construction support equipment are not available, then the project contractor shall ensure 50 horsepower off-road diesel-powered construction equipment is powered with California Air Resources Board (CARB)-certified Tier 4 Final engines or the equivalent.

Construction contractors shall maintain records of all off-road diesel construction equipment associated with on-site construction to document that each off-road diesel construction equipment used meets required emission standards. Records shall be kept on-site for the duration of construction activities and shall be made available for periodic inspection by City staff or their designee.

During construction activities, the City shall conduct periodic inspections to verify compliance with construction-related mitigation measures pursuant to the Mitigation Monitoring and Reporting Program.

The City of Banning shall verify these requirements ~~of this two-part measure has~~ have been incorporated into construction plans prior to issuance of any construction permits and during architectural coating activities.

Mitigation Measure AIR-2: The following unit-part mitigation measure shall be implemented during project Operations:

- Tenant lease agreements for the Development Project shall include contractual language restricting trucks and support equipment from nonessential idling longer than ~~5~~ 3 minutes while on site. The idling restriction will be presented on signs at the entrance to the industrial portions of the Development Project as well as at loading docks and truck parking areas.
- At buildout of the industrial land uses, a minimum of 50 ~~Level 3 AC~~ Class 8 electric vehicle (EV) truck chargers shall be installed at the tractor trailer parking spaces in logical locations to facilitate electric truck charging. These charges shall have the power rating sufficient to charge a Class 8 truck battery.
- The provision of EV chargers in each parking lot shall occur prior to occupancy of uses for said lots.
- All truck/dock bays that serve cold storage facilities within the proposed buildings shall be electrified to facilitate plug in capabilities and support use of electric standby and /or hybrid electric TRUs. A condition of approval shall be included for the cold storage facility that requires that by buildout at least 90 percent of trucks with TRUs are fully electric.

2.4 GHG EMISSIONS SUMMARY

Results of the updated emissions for the Project are summarized in Table E and Table F. The values that changed from the DEIR are underlined to facilitate ease of review. As shown, no new significant impacts would occur with the changes to the trip length and inclusion of TRU emissions.

Table E: Long-Term Greenhouse Gas Emissions at Buildout

Source	GHG Emissions (MT/yr)		
	Unmitigated Emissions from DEIR	**Revised Unmitigated Emissions**	**Net Change in Emissions**
Construction Emissions Amortized over 30 Years	487.49	487.49	0.00
Total Operational Emissions	56,415.47	62,357.47	5,942
Total Project Emissions	56,902.96	62,844.96	5,942
Thresholds	**3,000**	**3,000**	**NA**
Exceed Threshold?	**YES**	**YES**	**NA**
New Significant Impact as Compared with DEIR?	**NA**	**NO**	**NA**

Source: Compiled by MHC (May 2024). NA = Not Applicable
GHG = greenhouse gas MT/yr = metric tons per year

Table F: Long-Term Mitigated Greenhouse Gas Emissions at Buildout

Source	GHG Emissions (MT/yr)			
	Mitigated Emissions from DEIR	**Revised Emissions with DEIR Mitigation**	**Revised Emissions with DEIR Mitigation and Additional Quantified Reductions**	**Change due to Additional Quantified Reductions**
Construction Emissions Amortized over 30 Years	487.49	487.49	438.74	48.75
Total Operational Emissions	38,238.76	44,580.17	44,174.26	405.91
Total Project Emissions	38,726.25	45,067.66	44,613.00	454.66
Thresholds	**3,000**	**3,000**	**3,000**	**NA**
Exceed Threshold?	**YES**	**YES**	**YES**	**NA**
New Significant Impact as Compared with DEIR?	**NA**	**NO**	**NO**	**NA**

Source: Compiled by MHC (May 2024). NA = Not Applicable
GHG = greenhouse gas MT/yr = metric tons per year

3.1 UPDATES TO PROJECT ALTERNATIVES

Section 8 of the DEIR presented and analyzed four project alternatives. Alternative 1 is the No Project/No Build Alternative. Alternative 2, is the No Project/Existing General Plan and Zoning that included residential and commercial development consistent with the General Plan. Alternative 3 is the Reduced Commercial Alternative that only included the hotel and travel center as a commercial component of the Alternative and increased industrial land uses to keep the total square feet of land uses and footprint of this Alternative the same as the Proposed Project. Alternative 4 is the Reduced Industrial Alternative that keeps the commercial land uses and cold storage components of

the Proposed Project the same but reduces total Industrial land uses by 422,000 square feet and does not require the extension of Lincoln Street.

Based on SCAQMD and CARB recommended updates for truck trip lengths and inclusion of TRUs, the analysis of Alternative 1 and Alternative 2 in the DEIR remains unchanged and no further analysis is needed. Therefore, this analysis focuses on updates to Alternatives 3 and 4.

3.2 UPDATES TO ALTERNATIVES 3 AND 4

Based on the SCAQMD and CARB recommended updated truck trip lengths and inclusion of TRU emissions for the Project, the emissions totals for Alternatives 3 and 4 have also been adjusted to account for changes to the truck trip length and inclusion of TRUs. The Heavy-Duty Mobile Source emissions for Alternative 3 and Alternative 4 have been proportionally increased based on percentage increase in Heavy Duty Mobile Source emissions for the Project – from the DEIR to the updated emissions as identified on Table c. The proportional increase in percentage was applied to the Heavy-Duty Mobile Source emissions for Alternative 3 and 4 previously summarized in Appendix L-1 of the DEIR.

The approach of using a proportional increase based on Table 3 is appropriate and conservative since the proportional increases identified reflect the increased trip length assumption that would apply generally to both Alternative 3 and Alternative 4. Additionally, solely focusing the differences in truck trip generation based on Appendix L-5 of the DEIR shows that Alternative 3 results in an increase in trucks of approximately 3% and Alternative 4 would result in a decrease in trucks of 6% compared to the Project. As such, applying the proportional changes based on Table C to Alternatives 3 and 4 is more appropriate and conservative in nature. Additionally, TRU emissions have been added to both Alternative 3 and 4 as the DEIR did not previously include these emissions. Tables G and H summarize the updated emissions for Alternative 3 and Tables I and J summarize the updated emissions for Alternative 4. The values that changed from the DEIR's Appendix L-5 are underlined to facilitate ease of review. As shown, no new significant impacts would occur with the changes to the trip length and inclusion of TRU emissions for either Alternative 3 or 4.

Table G: Long-Term Greenhouse Gas Emissions at Buildout of Alternative 3

Source	GHG Emissions (MT/yr)		
	Unmitigated Emissions from DEIR	**Revised Unmitigated Emissions**	**Net Change in Emissions**
Construction Emissions Amortized over 30 Years	487.49	487.49	0.00
Total Operational Emissions	51,968.06	<u>58,629.92</u>	6,661.86
Total Project Emissions	52,455.55	<u>59,117.41</u>	6,661.86
Thresholds	**3,000**	**3,000**	**NA**
Exceed Threshold?	**YES**	**YES**	**NA**
New Significant Impact as Compared with DEIR?	**NA**	**NO**	**NA**

Source: Compiled by MHC (May 2024). NA = Not Applicable
GHG = greenhouse gas MT/yr = metric tons per year

Table H: Long-Term Mitigated Greenhouse Gas Emissions at Buildout of Alternative 3

Source	GHG Emissions (MT/yr)			
	Mitigated Emissions from DEIR	**Revised Emissions with DEIR Mitigation**	**Revised Emissions with DEIR Mitigation and Additional Quantified Reductions**	**Change due to Additional Quantified Reductions**
Construction Emissions Amortized over 30 Years	487.49	487.49	438.74	48.75
Total Operational Emissions	32,313.70	37,076.87	36,670.96	405.91
Total Project Emissions	32,801.19	37,564.36	37,109.70	454.66
Thresholds	**3,000**	**3,000**	**3,000**	**NA**
Exceed Threshold?	**YES**	**YES**	**YES**	**NA**
New Significant Impact as Compared with DEIR?	**NA**	**NO**	**NO**	**NA**

Source: Compiled by MHC (May 2024).
GHG = greenhouse gas
NA = Not Applicable
MT/yr = metric tons per year

Table I: Long-Term Greenhouse Gas Emissions at Buildout of Alternative 4

Source	GHG Emissions (MT/yr)		
	Unmitigated Emissions from DEIR	**Revised Unmitigated Emissions**	**Net Change in Emissions**
Construction Emissions Amortized over 30 Years	487.49	487.49	0.00
Total Operational Emissions	51,878.21	56,927.87	5,049.66
Total Project Emissions	52,365.70	57,415.36	5,049.66
Thresholds	**3,000**	**3,000**	**NA**
Exceed Threshold?	**YES**	**YES**	**NA**
New Significant Impact as Compared with DEIR?	**NA**	**NO**	**NA**

Source: Compiled by MHC (May 2024).
GHG = greenhouse gas
NA = Not Applicable
MT/yr = metric tons per year

Table J: Long-Term Mitigated Greenhouse Gas Emissions at Buildout of Alternative 4

Source	GHG Emissions (MT/yr)			
	Mitigated Emissions from DEIR	**Revised Emissions with DEIR Mitigation**	**Revised Emissions with DEIR Mitigation and Additional Quantified Reductions**	**Change due to Additional Quantified Reductions**
Construction Emissions Amortized over 30 Years	487.49	487.49	438.74	48.75
Total Operational Emissions	33,342.05	37,212.96	36,807.05	405.91
Total Project Emissions	33,829.54	37,700.45	37,245.79	454.66
Thresholds	**3,000**	**3,000**	**3,000**	**3,000**
Exceed Threshold?	**YES**	**YES**	**YES**	**NA**
New Significant Impact as Compared with DEIR?	**NA**	**NO**	**NO**	**NA**

Source: Compiled by MHC (May 2024).
GHG = greenhouse gas
NA = Not Applicable
MT/yr = metric tons per year

Michael Hendrix Consulting

ATTACHMENT A

SCAQMD WAIRE IMPLEMENTATION GUIDE

WAIRE Implementation Guidelines

Rule 2305 – Warehouse Indirect Source Rule - Warehouse Actions and Investments to Reduce Emissions (WAIRE) Program
Rule 316 – Fees for Rule 2305

June 2021

Version 1.1

ERRATA FOR WAIRE IMPLEMENTATION GUIDELINES

The WAIRE Implementation Guidelines was included in Appendix A of the Final Staff Report for Proposed Rule 2305 and Proposed Rule 316, which was adopted by the South Coast AQMD Board on May 7, 2021. The WAIRE Implementation Guidelines is a user guide to assist warehouse owners and operators to comply with the requirements of Rule 2305 and Rule 316. This version of the document (version 1.1) reflects the following updates.

Five corrections have been made to the WAIRE Implementation Guidelines which do not change the meaning or intent of Rule 2305 or Rule 316. Corrections address an inadvertent omissions that were added to better describe concepts included in Rule 2305 regarding truck trip counting, a typographic error in reference to Table 4, a typographic error in numbering and in reference to Table 5, and two typographic errors with incomplete sentences. The corrections are listed below and are identified in underline/strikeout in the Guidelines.

Page 4

4. Guardshack – Many warehouse operators employ a guard or other personnel to ~~(incomplete sentence)~~ staff their gate guardshack to control trucks entering the warehouse. The guard or warehouse personnel who interact with the driver of the truck entering the warehouse would complete a log of the truck entering with both visual observations of the truck and may supplement with additional questions asked of the driver of the truck. A guardshack log would include such information as the number and class of trucks (Class 2b to 7 vs. Class 8) or alternatively the number and type of trucks (tractor or tractor-trailers vs. straight trucks). The log should be daily if available but in no case should be less than one weekday (Monday – Friday, for the warehouse's entire operating hours) per month and one weekend day (Saturday or Sunday, for the warehouse's entire operating hours) per month (if the warehouse is open on weekends). Each weekday and weekend day once-per-month representative sample must be taken at least three weeks apart from the next respective sample. With this less intensive once-per month sampling method, a representative peak weekday and weekend day must be recorded (with documentation indicating why those days of the week were chosen). The weekday count may then apply to all weekdays during that month, and the weekend count may then apply to all weekend days during that month. The name of the guard or personnel completing the guardshack log should be on the log itself in case further clarification is needed.

~~4.~~5. Contracts or other similar records – Many warehouse operators are responsible for shipments to/from their warehouse, including with their own fleet or through third party fleets. Records such as contracts or manifests that document the loads delivered to or picked up from a warehouse can be used to determine truck trip information provided that all trips to a site are documented (which could include supplementary sources of data, such as through methods described above).

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Table ~~3~~ 4 provides an overview of the reporting requirements for Rule 2305. Appendix A to these Guidelines will provide a user's guide to the WAIRE Program Online Portal (POP)

through which warehouse operators and owners will submit their required reports and pay necessary fees.

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Table ~~4~~5 below provides an overview of the reporting metrics that warehouse operators must report on their AWR to earn WAIRE Points from the WAIRE Menu.

Table 4~~5~~ – WAIRE Menu Item Metrics

Page 13
Cameras may be used to record the trucks entering or exiting a warehouse site and document the truck license plate number (using either manual or automated tracking), and potentially other information such as fuel type, trucking company name, and DOT number. ~~Information from items (incomplete sentence)~~

Page 22
~~(Incomplete sentence) For Phase 2 and 3, t~~There is an early action provision that allows for earning WAIRE Points ahead of their initial compliance period, and include a provision for the clock on three year life of the WAIRE Points for those early action WAIRE Points to not begin until after the initial compliance period.

In addition, a supplement was included in the approved board package. Supplement number one is a clarification to specifically identify a type of action that may be permissible in a Custom WAIRE Plan, which is now incorporated on Page 17 of the Guidelines as shown below. The footnote on Page 21 was a placeholder and it has been updated to provide a link to the Resolution of the adopted Board package. Because these changes were approved by the Board, they do not appear in strikeout/underline in the Guidelines.

Page 17
A Custom WAIRE Plan allows for local hire to be counted as points towards compliance with the rule by reducing employee commute emissions. Use of a local state certified apprenticeship program or a skilled and trained workforce with a local hire component can help demonstrate those emission reductions. NZE yard trucks may be submitted as a Custom WAIRE Plan for consideration but only if they only utilize renewable fuels such as renewable natural gas (RNG), renewable propane, or other equivalents.

Page 21
[22]http://www.aqmd.gov/docs/default-source/Agendas/Governing-Board/2021/2021-May7-027.pdf?sfvrsn=10#page=16~~A link to the resolution will be added here if the rule is approved.~~

Finally, the headers, footers, and the page numbers of the WAIRE Implementation Guidelines have been updated to reflect it as a standalone document. A cover page and a table of contents has been added. The references to "Proposed Rule (PR)" have been updated to "Rule."

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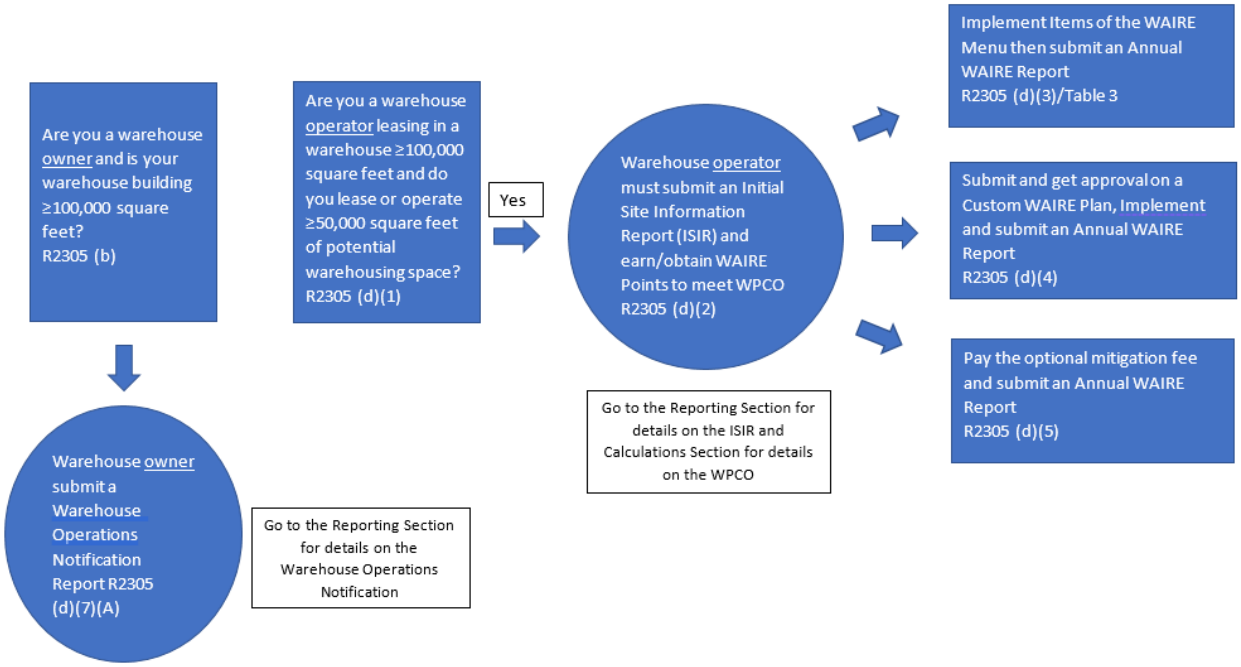
OVERVIEW

Rule 2305 is the Warehouse Indirect Source Rule (ISR) which provides the Warehouse Actions and Investments to Reduce Emissions (WAIRE) Program, a menu-based points system. The WAIRE Program determines a warehouse operator's WAIRE Points Compliance Obligation (WPCO) based on annual truck trips to each applicable new and existing warehouse that has at least 100,000 square feet of indoor floorspace within a single building that may be used for warehousing activities. Each warehouse operator must earn or obtain WAIRE Points to meet their WPCO on an annual basis. Rule 316 establishes fees to fund South Coast AQMD compliance activities associated with Rule 2305.

The WAIRE Program Implementation Guidelines (Guidelines) do not supersede the requirements specifically stated in Rule 2305 and Rule 316 but are meant to provide warehouse operators and owners with further guidance on complying with the rules. In any instance where an interpretation of requirements in these Guidelines conflicts with Rule 2305 or Rule 316, the rule language takes precedence. All owners and operators subject to Rule 2305 and Rule 316 should anticipate that the reports they submit and the records that they keep will be reviewed by South Coast AQMD staff in desktop audits and onsite field inspections, and are subject to public records act requests. Further, data regarding warehouse operator compliance will be made publicly available on South Coast AQMD's website. For any questions about this guidance document, please contact program staff at waire-program@aqmd.gov.

APPLICABILITY

Figure 1 – Applicability Flow Chart



The warehouse ISR applies to warehouse operators and owners of warehouses greater than or equal to 100,000 square feet of indoor floor space within a single building that may be used for warehousing activities. A warehouse operator or owner whose warehousing activity is not explicitly excluded from Rule 2305 is presumed to be included in rule requirements. Figure 1 represents a simplified diagram of the requirements for warehouse owners and operators of applicable warehouses. Warehouse owners are only required to submit a Warehouse Operation Notification Report which detail the size and tenant status of the warehouse, further details are provided in the Reporting Section of these Guidelines. Warehouse operators are required to submit an Initial Site Information Report and are required to earn WAIRE points. Warehouse owners may choose to earn WAIRE points on behalf of the warehouse operator.

In addition to the warehouse size applicability, the warehouse ISR is implemented over time based on the applicable warehouse sizes. The warehouse size phase-in shown in Table 1, and details the date range for the Initial Compliance Period when warehouse operators must earn or obtain WAIRE Points to meet their WPCO, and also the due dates for Initial Site Information Report, and the first Annual WAIRE Report.

Table 1 – Implementation Schedule

Phase	Warehouse Size (square feet)	Initial Site Information Report Due Date	First Annual WAIRE Report Due Date	Initial Compliance Period
1	> 250,000	July 1, 2022	January 31, 2023	January 1, 2022 to December 31, 2022
2	> 150,000-<250,000	July 1, 2023	January 31, 2024	January 1, 2023 to December 31, 2023
3	> 100,000-<150,000	July 1, 2024	January 31, 2025	January 1, 2023 to December 31, 2024

CALCULATIONS[1]

The WPCO is the number of WAIRE Points a warehouse operator must earn or obtain to comply with Rule 2305. Figure 2 represents a simplified diagram of how a WPCO is calculated based on the number and type of trucks that enter or exit a warehouse site.

Figure 2

Truck trips are defined as one-way trips that tractors and straight trucks make to a warehouse facility when delivering goods to or from another location.[2] They are counted when a truck enters or exits a site. A single visit from a truck is equal to two trips. Rule 2305 refers to the total calculated truck trips in a compliance period as Weighted Annual Truck Trips (WATTs) which is calculated by inputting the actual truck trip counts of the number and type of trucks in the following equation:

$$WATTs = [Class\ 2b\ to\ 7\ truck\ trips] + [2.5 \times Class\ 8\ truck\ trips]$$

As shown in Figure 2, the WATTs are multiplied by the Stringency factor and the Annual Variable to provide the WPCO for the warehouse. The Stringency factor is defined as 0.0025 WAIRE Points per WATTs, and the annual variable is determined by the phase-in schedule of the warehouse and is provided in Table 2.

Table 2 – Annual Variable

Annual WAIRE Report Year*	Annual Variable		
	Phase 1	Phase 2	Phase 3
2022	0.33	0	0
2023	0.67	0.33	0
2024	1.0	0.67	0.33
2025	1.0	1.0	0.67
2026 and beyond	1.0	1.0	1.0

*This is the compliance period for which a warehouse operator is first required to submit its Annual WAIRE Report.

[1] The WAIRE Menu Technical Report, included as Appendix B in the Rule 2305 staff report, is included as an appendix to these Implementation Guidelines to assist in determining how WAIRE Points are calculated.

[2] A truck or yard truck delivering a trailer or goods from one part of a warehouse to another part of a warehouse is not considered a truck trip since it does not include delivery of goods to/from another location.

TRUCK TRIP COUNTS FOR DETERMINING WPCO

The WATTs calculation equation weighs the activity and emission contribution of a Class 2b-7 straight truck and that of a Class 8 tractor which emits approximately 2.5 times more NOx emissions. Class 8 tractors are differentiated from Class 2b-7 straight trucks by their Gross Vehicle Weight Rating being greater than 33,001 pounds. Absent more specific data, all tractors that can pull a trailer should be counted as Class 8, and all straight trucks should be counted as Class 2b-7.

With the WPCO being closely tied to the number of actual truck trips entering and exiting the warehouse site, it is important to accurately document the total number of truck trips and whether they were Class 8 tractors or Class 2b-7 straight trucks. Truck trips must be counted and records must be verifiable, where date and time of the truck trips recorded may be tied to the compliance period records for review. Below are five examples of methods to count the number of truck trips. The key criteria for ensuring that the truck trip counts are accurate enough for determining a warehouse operator's WPCO is that the data needs to be collected using a method that provides reliable and verifiable truck trip counts that are either contemporaneous (e.g., daily) or extrapolated from a short term contemporaneous tracking during a representative peak period, as described below. Warehouse operators are responsible for maintaining data the support the truck trip count and the data must be made available to South Coast AQMD for verification. Verifiable data can be provided through the following methods:

1. Electronic Telematics Systems – These systems are used to track truck activity, typically through the use of on-board GPS systems and fleet management software. These systems can track when equipped vehicles are located at a warehouse.

2. In-Roadway or Driveway Sensors - Various sensor technologies are available to count vehicles such as pneumatic tubes, radar, or lasers installed at a driveway. These devices are used to count the number of vehicles passing a certain point and can provide truck classification data (e.g., straight trucks).

3. Video Monitoring – Many warehouse operators already employ security cameras to monitor their gates. Warehouse operators could use staff or software to identify the number and type of trucks that enter the gate and note truck Class (i.e. straight trucks vs. tractors) from video recordings. Video recordings and subsequent counts can be continuous but in no cases should be less than one weekday (Monday – Friday) per month and one weekend day (Saturday or Sunday) per month (if the warehouse is open on weekends). Each weekday and weekend day once-per-month sample must be taken at least three weeks apart from the next respective sample. With this less intensive once-per month sampling method, a representative peak weekday and weekend day must be recorded (with documentation indicating why those days of the week were chosen). The weekday count may then apply to all weekdays during that month, and the weekend count may then apply to all weekend days during that month.

4. Guardshack – Many warehouse operators employ a guard or other personnel to ~~(incomplete sentence)~~ staff their gate guardshack to control trucks entering the warehouse. The guard or warehouse personnel who interact with the driver of the truck entering the warehouse would complete a log of the truck entering with both visual observations of the truck and may supplement with additional questions asked of the driver of the truck. A guardshack log would include such information as the number and class of trucks (Class 2b to 7 vs. Class 8) or alternatively the number and type of trucks (tractor or tractor-trailers vs. straight trucks). The log should be daily

if available but in no case should be less than one weekday (Monday – Friday, for the warehouse's entire operating hours) per month and one weekend day (Saturday or Sunday, for the warehouse's entire operating hours) per month (if the warehouse is open on weekends). Each weekday and weekend day once-per-month representative sample must be taken at least three weeks apart from the next respective sample. With this less intensive once-per month sampling method, a representative peak weekday and weekend day must be recorded (with documentation indicating why those days of the week were chosen). The weekday count may then apply to all weekdays during that month, and the weekend count may then apply to all weekend days during that month. The name of the guard or personnel completing the guardshack log should be on the log itself in case further clarification is needed.

5. Contracts or other similar records – Many warehouse operators are responsible for shipments to/from their warehouse, including with their own fleet or through third party fleets. Records such as contracts or manifests that document the loads delivered to or picked up from a warehouse can be used to determine truck trip information provided that all trips to a site are documented (which could include supplementary sources of data, such as through methods described above).

Loss of Truck Trip Count Data

In the event that there is insufficient truck trip data due to events beyond the warehouse operator's control such as with records destroyed in a fire or other force majeure event, an alternative WATTs calculation may be used as described below.[3] The WATTs must be calculated using the equation and table below.

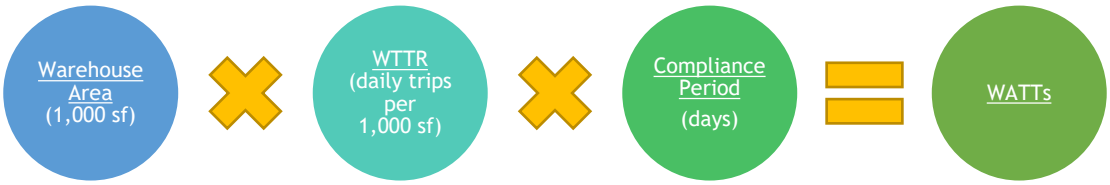


Table 3 Weighted Truck Trip Rates (WTTR)

Warehouse Type	WTTR (trips/1,000 sf)
≥200,000 sf	0.95
≥100,000 – 199,999 sf	0.67
Cold Storage (≥100,000 sf)	2.17

Example calculation for a 250,000 square foot (non-cold storage) warehouse that experienced a force majeure event and lost 30 days of records:

250 tsf × 0.95 trips/tsf × 30 days = 7,125 WATTs

[3] This alternative calculation can only be used in cases of force majeure. Normal practice requires the warehouse operator to count all truck trips. Further details on the alternative WPCO calculation are available at Rule 2305 (d)(1)(C).

These calculated WATTs would be added to the other WATTs counted during the rest of the compliance period to determine the warehouse operator's WPCO.

REPORTING

Report Submission

Warehouse operators and owners subject to Rule 2305 are required to submit reports to South Coast AQMD to provide details on their applicable warehouse operations and compliance. Rule 2305 requires that all records used to demonstrate compliance be maintained by warehouse operators or owners, as applicable, for a period of no less than seven years and made available to South Coast AQMD upon request during normal business hours in order to determine compliance. Table ~~3~~4 provides an overview of the reporting requirements for Rule 2305. Appendix A to these Guidelines will provide a user's guide to the WAIRE Program Online Portal (POP) through which warehouse operators and owners will submit their required reports and pay necessary fees.[4]

[4] This appendix will be developed if the rule is approved and once the WAIRE POP has been developed. If the WAIRE POP system is not available, all reports should be submitted to waire-program@aqmd.gov.

Table 4 Reporting Overview

WAIRE Program Report	Reporting Entity	Information Required	Due Dates
Warehouse Operations Notification (WON)	Warehouse Owners	• Warehouse size and area that may be used for warehousing activity, • Warehouse operator(s) name and contact information, • Lease end date (if applicable), • Previous warehouse operator(s) information, • Square footage used by the warehouse owner for warehousing activities	• On or before September 1, 2021 • Within 14 days of a new warehouse operator having access to at least of 50,000 square feet of space for warehousing activities, • Within 30 days after a renovation that alters the size of the warehouse, • Within 3 days of a request for the report from South Coast AQMD
Initial Site Information Report (ISIR)	Warehouse Operators*	• Warehouse size and space used for warehousing activities,** • Number of truck trips in the previous 12-month period,*** • Number of truck trips anticipated during the compliance period for which the upcoming AWR must be submitted, • Anticipated actions to meet the WPCO for the current compliance period, • Details on the following potential onsite equipment: owned or leased truck fleet, onsite alternative fueling stations, yard trucks, and onsite energy generation systems (e.g., solar)	• On or before July 1 of the first compliance period when the warehouse operator must submit their first Annual WAIRE Report for that warehouse • Within 30 days of a request for the report from South Coast AQMD
Annual WAIRE Report (AWR)	Warehouse Operators*	• Truck trip counts for the compliance period, • Number of WAIRE Points earned for each action, • Associated metrics for the WAIRE Menu actions used to earn WAIRE Points	• No more than 30 days after January 1 of the compliance period • If an operator vacates a warehouse before the AWR submission deadline in any year, they must submit an AWR no later than the date they vacate the warehouse.

* The warehouse owner may choose to comply on behalf of the warehouse operator, or may be required to submit the report if they are also the warehouse operator.
** If the warehouse building size is <100,000 sf, or if the warehouse operator leases <50,000 sf for warehousing activities, then no further reporting is required. Multiple warehouse operators owned or controlled by a single parent company collectively leasing ≥50,000 sf for warehousing activities in a warehouse do not qualify for this exemption from additional reporting. Also, if an activity is not expressly exempt from rule requirements, it is presumed to be subject to the rule.
*** Warehouses submitting an ISIR before July 1 2022 are only required to report truck trips since July 1, 2021.

Warehouse Operations Notification Report

The Warehouse Operations Notification (WON) must be submitted by an authorized official of the warehouse owner through the WAIRE POP online system. The applicable administrative fee listed in Rule 316 must be submitted via e-check or credit card at the same time as the WON. Warehouses owners submitting a WON for a warehouse with less than 100,000 square feet of floor area dedicated to warehousing activities are exempt from the reporting fee.

Warehouse Renovation or Size Change

In the event there is a change in the applicable 100,000 square feet or greater of indoor floor space within a single building that may be used for warehousing activities, a WON must be submitted within 30 days of receiving a certificate of occupancy from the applicable local building department. Example renovations could include expanding the size of the building to add more warehousing space, or constructing more office space within the warehouse such that the indoor floor space that may be used for warehousing activities is now less than 100,000 feet.

New Warehouse Operator

Any time a new warehouse operator takes over operational control of at least 50,000 square feet of a warehouse building with more than 100,000 square feet that may be used for warehouse activities, a WON must be submitted within 14 days to report that change. A typical example would include a new tenant's starting date for their lease.

Initial Site Information Report

The Initial Site Information Report (ISIR) must be submitted by an authorized official of the warehouse operator through the WAIRE POP online system. ISIRs are only submitted during the first compliance period a warehouse operator is occupying the warehouse[5], and prior to the first AWR unless requested by the South Coast AQMD Executive Officer. The applicable administrative fee listed in Rule 316 must be submitted via e-check or credit card at the same time as the ISIR.

Warehouse Size

The ISIR must include the total indoor floor square footage of the applicable warehouse building and the amount of space the warehouse operator leases that may be used for warehousing activities. Typical records used to determine this information will be the operator's lease, information from the warehouse owner, and/or property tax assessment data. The warehouse operator may need to make their own determination about how much of the warehouse facility they can use for warehousing activities. [6] Vacant areas that may be used for warehousing activities (e.g., empty storage racks, open floor space designed for warehousing, drive paths for

[5] Additional ISIRs would be required to be submitted by the warehouse operator should they relocate to a different warehouse subject to Rule 2305.

[6] Areas that may be used for warehousing activities include indoor spaces related to the storage and distribution of goods, including but not limited to the storage, labelling, sorting, consolidation and deconsolidation of products into different size packages. Supporting office administration (e.g., employee break areas, restrooms, offices, etc.), maintenance (e.g., vehicle maintenance or charging/fueling areas), manufacturing areas, or retail sales areas open to the general public, within the same warehouse building, that are physically separate from the warehouse area, are not considered warehousing activities.

pallet jacks or forklifts used in warehousing activities) must be included in the square footage calculation.

No additional reporting is required in the ISIR if 1) the total square footage that may be used for warehousing activities in that facility is less than 100,000 square feet, or 2) the warehouse operator's lease does not allow them to use more than 50,000 square feet for warehousing activities.

Truck Trips
There are two sets of truck trip data that must be reported in the ISIR. First, truck trips from the previous 12-month period must be recorded using the same types of methods used to determine the operator's WPCO (see discussion beginning on page 4). Because the ISIR is due by July 1, the typical applicable period for this reporting would be from the previous June 1 through May 31 period. Trips only need to be reported from periods when the operator occupied the warehouse. For example, if an operator's lease only began in September of that previous year, then truck trips only need to be reported from that period on.

Second, the operator must provide an estimate of the number of truck trips that will be reported during the applicable period for their upcoming Annual WAIRE Report. This estimate could just be an extrapolation of the data reported above for the previous 12-month period, or could include an estimate based on expected business through the end of the compliance period.

These two sets of truck trip data can serve as a basis for the operator to estimate their WPCO for that compliance period. However, the final WPCO used in the Annual WAIRE Report must be based on the actual truck trip counts during the compliance period itself (see discussion below).

Onsite Warehouse Equipment
The Initial Site Information Report requires information on existing onsite equipment at the warehouse for onsite fleets, ZE charging/fueling station, yard trucks, and solar panels. Baseline information on the onsite equipment is required to assist in calculating future WAIRE Points that may be potentially earned from the usage of the existing onsite equipment.

Anticipated Approach for Earning WAIRE Points
Using the truck trip data provided in the ISIR (described above) and the subsequent estimated WPCO, the warehouse operator must also submit how they anticipate meeting that WPCO for the current compliance period. This could include any combination of approaches from the WAIRE Menu, a Custom Plan, transferred Points, or the mitigation fee. This portion of the report is a planning exercise to assist the operator and the South Coast AQMD on the anticipated mechanisms that will be used for compliance. Recognizing that conditions can change, the actual approach used to earn WAIRE Points in the Annual WAIRE Report does not need to follow the approach outlined in the ISIR.

Annual WAIRE Report
An Annual WAIRE Report (AWR) must be submitted by every warehouse operator who must satisfy a WPCO for every compliance period, beginning with their Initial Compliance Period (see page 2). Warehouse owners who intend to voluntarily want to earn WAIRE Points, on

behalf of a warehouse operator, must also submit an AWR at the end of the compliance period when the Points were earned. The AWR must be submitted by an authorized official of either the warehouse operator, or owner if the WAIRE Points are earned by the owner, through the WAIRE POP online system. The applicable administrative fee listed in Rule 316 must be submitted via e-check or credit card at the same time as the AWR.

Truck Trip Counts

The number of truck trips for the compliance period must be reported specifying the number of Class 2b-7 straight trucks and Class 8 tractors that entered or exited the warehouse site, following the methods described beginning on page 3. Upon entering the truck trip data for the compliance period into the WAIRE POP system, the corresponding WPCO will be displayed using the equation shown on page 3.

Earned WAIRE Points

The warehouse operator must report how the WPCO was satisfied in terms of how many WAIRE Points were earned from:

1) Each WAIRE Menu action, and/or
2) Actions in an approved Custom WAIRE Plan, and/or
3) Points transferred from another site, the warehouse owner, or banked from a previous year, and/or
4) The mitigation fee.

For WAIRE Points earned from the WAIRE Menu, the warehouse operator must report the associated level of implementation using the reporting metrics for each WAIRE Menu action (see Table 3 of Rule 2305). The applicable increments of progress must be reported for actions implemented from an approved Custom WAIRE Plan. For WAIRE Points that were transferred or banked, the original method used to earn those WAIRE Points must also be reported, including who originally earned the WAIRE Points and when and how the WAIRE Points were earned.

RECORDKEEPING

Adequate records that document all reported information must be maintained for seven years after the applicable report was submitted and be available upon request during normal business hours. While summarized information is reported in the WON, ISIR, and AWR, during audits and field inspections South Coast AQMD staff will require warehouse operators and owners to provide detailed records in order to verify the accuracy of the information submitted.

WAIRE MENU

The WAIRE Menu provides flexibility in a warehouse operator's ability to comply with the WPCO. Table 3 in Rule 2305 provides the WAIRE Menu showing the actions, the annual metrics, and the WAIRE Points based on the listed annual metric. The following discussion describes the factors that South Coast AQMD staff will review during audits and inspections for each WAIRE Menu option. Table ~~4~~5 below provides an overview of the reporting metrics that warehouse operators must report on their AWR to earn WAIRE Points from the WAIRE Menu.

Table ~~4~~5 – WAIRE Menu Item Metrics

WAIRE Menu Action/Investment	WAIRE Menu Reporting Metric for Each Compliance Period
Acquire ZE/NZE Trucks	Number of ZE/NZE Trucks Acquired by Truck Class
Visit from ZE/NZE Trucks	Number of ZE/NZE Truck Visits
Acquire ZE Yard Trucks	Number of ZE Yard Trucks Acquired
Use ZE Yard Truck	Number of Hours a ZE Yard Truck Operated
Install Onsite Solar Panel System	Kilowatt Rating of Installed System
Use Onsite Solar Panel System	Number of kWh Generated by the Solar Panel System
Install Stand-Alone MERV 16 or Greater Air Filtration Systems	Number of Stand-Alone Air Filtration Systems Installed
Replace MERV 16 or Greater Air Filters	Number of MERV 16 or Greater Air Filters Replaced

NZE/ZE Truck Acquisition

Many warehouse operators already own and operate trucks, and they may acquire NZE or ZE trucks for their fleet to earn WAIRE Points. Vehicle Identification Numbers and records verifying that the truck was acquired by the warehouse operator must be kept. Acquisition could include purchasing, leasing, or renting trucks. If a truck is leased or rented, the WAIRE Points earned for that temporary acquisition are proportional to the amount of the compliance period that the truck is leased or rented. For example, if truck is leased for 6 months of a 12-month compliance period, the number of WAIRE Points earned would be one half of the amount shown in Table 3 of Rule 2305. In the case of a Class 6 NZE truck, the warehouse operator would earn 13 WAIRE Points, instead of the 26 WAIRE Points shown in the WAIRE Menu for the full annual period.

NZE trucks fueled by natural gas have been commercially available for the past few years in a variety of Classes, with engines ranging from 6.7 liters to 11.9 liters to serve both medium duty

and heavy duty applications.[7] NZE engines are defined as the lowest non-zero optional low NOx standard at the time of the engine's manufacture, which is currently 0.02 g/bhp-hr. One benefit of NZE is that publicly accessible fueling infrastructure for trucks already exists throughout the region and beyond.[8]

Many ZE trucks are also commercially available today in a variety of truck Classes, and many more are expected in the next few years.[9] In the near term, charging or fueling infrastructure may be installed at a warehouse facility (which also would earn WAIRE Points), or may be available from a truck leasing company. Additional ZE charging and fueling infrastructure is expected to be installed in the coming years.

If a warehouse operator earns WAIRE Points from the acquisition of ZE or NZE trucks, they will need to retain records of the purchase, lease, or rental of the truck (such as a purchase invoices, or lease agreement), and documentation (e.g., onsite video or photographs from multiple days) that the truck serves that warehouse facility (e.g., that it is domiciled at that site or regularly visits that site). The purchase, lease, or rental documentation must contain enough information to demonstrate that the truck is NZE or ZE, as well as the truck Classification (e.g., the gross vehicle weight rating).

Existing funding programs[10] like Carl Moyer, Proposition 1B, Hybrid Voucher Incentive Program, etc. cannot be used to purchase a truck and also earn WAIRE Points for truck acquisition due to statutory prohibitions preventing those incentive programs from being used to comply with a regulation. The warehouse operator therefore has the option of either receiving incentives to reduce the purchase price of a NZE or ZE truck or foregoing the incentives to earn WAIRE Points for the NZE/ZE truck acquisition.

NZE/ZE Truck Visits

WAIRE Points may also be earned for every visit to a warehouse by a NZE or ZE truck.[11] It is important to note, that WAIRE Points for acquisition and visits from the same truck can be earned in the same compliance period. Trucks that were purchased using incentive funds from the previously described funding programs, can be used for crediting towards number of ZE or NZE truck visits. WAIRE Points are earned for each NZE or ZE truck visit, which includes the truck trip into and out of the facility. The number of truck trips to earn WAIRE Points can be more or less than the annualized metric in the WAIRE Menu. WAIRE Point values from the WAIRE Menu can be ratioed (for any WAIRE Menu action), as demonstrated in the following example. In the WAIRE Menu, 42 Points are earned for 365 visits from a Class 8 NZE truck. If

[7] https://www.epa.gov/sites/production/files/2021-01/documents/420f21002.pdf, https://ww3.arb.ca.gov/msprog/onroad/cert/cert.php#6, https://www.ngvamerica.org/vehicles/availability/?vehicle_type=heavy-duty-truck-oems

[8] https://afdc.energy.gov/fuels/natural_gas_locations.html#/analyze?region=US-CA&fuel=LNG&fuel=CNG&lng_vehicle_class=HD&show_map=true&cng_vehicle_class=HD

[9] https://globaldrivetozero.org/tools/zero-emission-technology-inventory/

[10] http://www.aqmd.gov/home/programs/business/business-detail?title=vehicle-engine-upgrades

[11] Trucks that have been purchased through incentive programs can earn WAIRE Points at the same level as trucks that are not incentivized.

a warehouse operator has 1,000 Class 8 NZE truck visits during their compliance period, the number of WAIRE Points earned would be:

$$\frac{42\ Points}{365\ visits} = \frac{XX\ Points}{1{,}000\ Visits} \rightarrow \mathbf{115.1\ Points}$$

NZE and ZE truck visits can come from the warehouse operator's own fleet or by any other third party fleet (whether contracted by the warehouse operator or not). NZE and ZE truck visit counts must be made contemporaneously with the trips and records documenting the visits must be verifiable by South Coast AQMD staff. Example methods to record these truck visits are described below.

1. Trucker check-in – Many warehouses already require some type of check-in from truck drivers when they arrive onsite. As part of that check-in process, warehouse operators could fill out a short form with the following information for every ZE or NZE truck that visits the site[12] (either themselves or through a form filled out by the truck driver):

    a. The date and time that the truck arrived
    b. Truck license plate number[13] and Vehicle Identification Number (VIN)
    c. Truck fuel type (e.g., natural gas, electric, hydrogen)
    d. Trucking Company Name, DOT number, and contact phone number (if not owned by the warehouse operator)
    e. If filled out by a truck driver unaffiliated with the warehouse, the driver's name and signature confirming that the above information is accurate

2. Electronic Telematics System (ETS) – ETS systems are increasingly used to track truck activity, and warehouse operators that employ these systems can use the data it collects and supplement it with truck characteristics (i.e., items b. through d. above) to determine how many NZE and ZE visits occur.

3. Security Cameras – Cameras may be used to record the trucks entering or exiting a warehouse site and document the truck license plate number (using either manual or automated tracking), and potentially other information such as fuel type, trucking company name, and DOT number. ~~Information from items (incomplete sentence)~~

4. Contractual Records – Some warehouse operators arrange for trucking services from third party fleets. Provisions within the contract requiring NZE or ZE trucks to be used (and resulting in a specified number of visits) could be used as one method of documentation. Additional documentation verifying that the NZE or ZE trucks have actually visited the warehouse must also be maintained.

ZE Yard Trucks

[12] As a point of reference, for a typical 250,000 sf warehouse that has about 42 Class 8 truck visits per day, only about 5 NZE Class 8 truck visits would be required per day on average (at a stringency of 0.0025) if this method was used to earn WAIRE Points.

[13] The license plate number of the truck/tractor, not the trailer.

Yard trucks are utility trucks that can be classified as on-road or off-road vehicles and are typically used to move trailers and containers around a warehouse yard or to nearby locations. NZE yard trucks are not included as an option in the WAIRE Menu but may earn WAIRE Points in a Custom WAIRE Plan (further details are provided in the Custom WAIRE Plan section). WAIRE Points may be earned for the acquisition[14] as well as the use of the ZE yard truck within the same compliance period. Proof of the acquisition of the ZE yard truck in the form of receipt, invoices, contract or similar documents must be kept by the warehouse operator.

Warehouse operators must keep records of the number of hours of ZE yard truck use during every compliance period for which it earns WAIRE Points. In most cases the operating hours for a yard truck can be obtained from an hour meter on the yard truck. If the yard truck does not have an hour meter installed, a warehouse operator could have one installed as a way to document the hours of operation needed to earn WAIRE Points, or the hours could be recorded through other means (like a time sheet). The hours of operation should be logged regularly either weekly or monthly to keep the records accurate and prevent errors in reporting the annual metric.

ZE Charging or Fueling Infrastructure

ZE charging or fueling infrastructure for on-road vehicles and yard trucks[15] can earn WAIRE Points when installed[16] and when used.[17] NZE fueling infrastructure installation or use is not included as an option in the WAIRE Menu and is prohibited from earning WAIRE Points in a Custom WAIRE Plan. Warehouse operators will need to consult with warehouse owners, local utilities, and local building departments prior to installing ZE infrastructure. Warehouse facility or land owners may also voluntarily install the ZE infrastructure and earn WAIRE Points, and subsequently transfer those WAIRE Points to the warehouse operator(s) at that site. Offsite installations can earn WAIRE Points, but only through a Custom WAIRE Plan.

Electric Charging Infrastructure Installation

A long lead time may be needed to install electric charging infrastructure at some sites, and WAIRE Points may be earned for several milestones that are achieved during project completion. The table below describes the milestones and examples of the documentation needed to verify that the milestone was achieved.

Electric Charger Installation Milestone	Examples of Documentation

[14] Similar to the discussion on truck acquisitions above, existing incentive programs cannot be used to acquire ZE yard trucks, due to limitations within the incentive funding programs.

[15] ZE charging/fueling infrastructure installations or usage for industrial trucks used indoors (e.g., pallet jacks or forklifts) cannot earn WAIRE Points.

[16] In order to avoid potential problems of low quality workmanship and subsequent safety concerns, warehouse operators and owners earning WAIRE Points from installing ZE infrastructure are encouraged - though not required - to use a skilled and trained workforce as defined in Public Contract Code section 2601 for all construction work, and follow the Public Utilities Code section 740.20, subdivision (2) requirement that at least 25 percent of the total electricians working on an electric vehicle infrastructure project, at any given time, hold Electric Vehicle Infrastructure Training Program certification.

[17] Similar to truck acquisitions, most incentive funding programs from CARB, South Coast AQMD, and the Energy Commission cannot be used to install charging infrastructure used to earn WAIRE Points. However, utility programs like Southern California Edison's Charge Ready Transport program have different requirements and do not have the same restrictions.

Acquisition of the charger(s) (also called EVSE's)	Invoices and photo/video documentation that the chargers have been delivered to the site. Records of any incentives or rebates received for the chargers or charger installation.
Initiating onsite construction	Copies of permits and photo/video documentation showing that construction was initiated.
The latter of final energization or permit sign-off for the system	Permit records and/or photo/video documentation of the system in use.

The WAIRE Menu only includes ZE charging infrastructure up to 350 kW. Chargers with higher ratings are not yet commercialized but are expected in the near future. Warehouse operators can earn WAIRE Points for these larger systems through a Custom WAIRE Plan. WAIRE Points can also be earned for installing chargers for Transportation Refrigeration Units (TRUs). As of February 2021, CARB is currently developing a new regulation that could mandate the installation and use of TRU chargers at cold storage warehouses covered by Rule 2305. In order to earn WAIRE Points for TRU charger installations, if CARB's proposed rule is adopted and goes into effect, warehouse operators would be required to either install more chargers than required by CARB's rule in any given year, or install chargers before CARB's rule requires them.

Electric Charging Infrastructure Usage

Warehouse operators earning WAIRE Points from charger usage[18] for on-road vehicles and/or yard trucks are required to report total kWh dispensed from charging stations at that site. Charger usage earns WAIRE Points equally for trucks owned by a warehouse operator and for third party fleets. Individual charger kWh are not required to be recorded or reported if a single master electrical meter is dedicated to all chargers and does not serve any other electrical loads (this is a common setup in charger installations). Records documenting this electrical usage would typically include electric utility bills, but could also include photo documentation of meter readouts, or charging software system reports.

Similar to the discussion above for TRU charger installation, if CARB's proposed rule on TRU's is approved and goes into effect, WAIRE Points may only be earned for TRU charging if it exceeds requirements in CARB's rule. Records must be kept documenting how the usage goes beyond CARB requirements for any WAIRE Points earned in this situation.

Hydrogen Station Installation and Use

Hydrogen station installations are expected to occur on a faster timeline than electric charging infrastructure, and specific milestones are not included in the WAIRE Menu. WAIRE Points may be earned upon final station installation and availability for fueling. Records documenting the station installation can include permit records, invoices, and photo/video documentation of the station. The WAIRE Menu assigns 1,680 WAIRE Points for the installation of a hydrogen station capable of dispensing 700 kg/day for on-road vehicles and/or yard trucks. Similar to the

[18] Warehouse operators may obtain Low Carbon Fuel Standard (LCFS) credits and/or revenue from those credits and still earn WAIRE Points for that dispensed electricity.

ratio method described in the truck visit section, stations with higher or lower throughput capacities would receive proportionally more or less WAIRE Points than listed in the WAIRE Menu.

Hydrogen station use must be reported in total kilogram dispensed during the compliance period. The station can be used for the warehouse operator's own fleet or for third party trucks. Records documenting this use should include a meter read-out and can also include invoices for delivered hydrogen, or other similar records.

Solar Panel System Installation and Use

Solar panel system installations can be installed either on the roof of the warehouse or as a carport configuration. Warehouse operators will need to consult with warehouse owners, local utilities, and local building departments prior to installing solar panel systems. Additionally, the warehouse facility or land owner may voluntarily install the solar panels and earn WAIRE Points that they can subsequently transfer to their warehouse operator(s). Proof of the installation of the solar panel system and its kilowatt (kW) rating in the form of receipt, invoices, contract, photos/videos, or similar documents should be maintained for future audits and inspections. WAIRE Points will be awarded upon the latter date of system energization or final permit sign-off.

The total energy produced by the solar system is typically recorded through software systems and may differ from reports provided by utilities. The total system energy production (measured in kilowatt-hours or kWh) is available to earn WAIRE Points, not just the net energy reported by the utility. Both the installation size and the system usage can be scaled using the ratio method described in the truck visits section.

Air Filtration Systems

Air filtration systems can be installed or air filters replaced at residences, schools, daycares, hospitals, or community centers within three miles of the warehouse in order to reduce exposure to particulate matter.[19] The minimum type of filters that can be installed or replaced are minimum efficiency reporting value (MERV) 16 or greater efficiency. Records documenting the number of systems installed or filters replaced could include invoices, contracts, photos/videos of installed systems, or similar documents. The documentation must include proof that the systems were actually installed, and not just purchased. Earning WAIRE Points with this approach will therefore require coordination with, and voluntary cooperation from other entities. Air filtration system installations and filter replacements can be scaled using the ratio method described in the truck visits section.

[19] Example systems are described here: http://www.aqmd.gov/docs/default-source/ceqa/handbook/aqmdpilotstudyfinalreport.pdf

CUSTOM WAIRE PLANS

Rule 2305 provides the option of proposing a Custom WAIRE Plan for actions that are not on the WAIRE Menu. WAIRE Points can only be earned upon approval of the Custom WAIRE Plan, any action or investments made prior to the approval of the Custom WAIRE Plan will not be considered for WAIRE Points. The process for applying for a Custom WAIRE Plan is shown in Figure 3 below. Custom WAIRE Plan Applications must be submitted through the WAIRE POP system, or as otherwise directed by South Coast AQMD, along with the applicable fee in Rule 316.

Some examples of potential Custom WAIRE Plan proposals include jointly owned off-site ZE charging or fueling infrastructure, the use of battery storage systems or energy management that reduces emissions from local natural gas fired powerplants, and the acquisition and/or usage of NZE yard trucks. A Custom WAIRE Plan allows for local hire to be counted as points towards compliance with the rule by reducing employee commute emissions. Use of a local state certified apprenticeship program or a skilled and trained workforce with a local hire component can help demonstrate those emission reductions. NZE yard trucks may be submitted as a Custom WAIRE Plan for consideration but only if they only utilize renewable fuels such as renewable natural gas (RNG), renewable propane, or other equivalents.[20] The section below provides an example of a Custom WAIRE Plan calculation methodology to earn WAIRE Points for NZE yard trucks.

NZE Yard Truck WAIRE Points Calculation Example

The acquisition and/or use of NZE yard trucks may be proposed as a Custom WAIRE Plan if the NZE yard truck's engine meets CARB's lowest Optional Low NOx standard (currently 0.02 g/hp-hr) applicable at the time of engine manufacture and is fueled with renewable fuels. The expected WAIRE Points for NZE yard trucks in a Custom WAIRE Plan are shown below, following the same methods as is described for ZE yard truck acquisition and usage in Appendix B – WAIRE Menu Technical Report.[21]

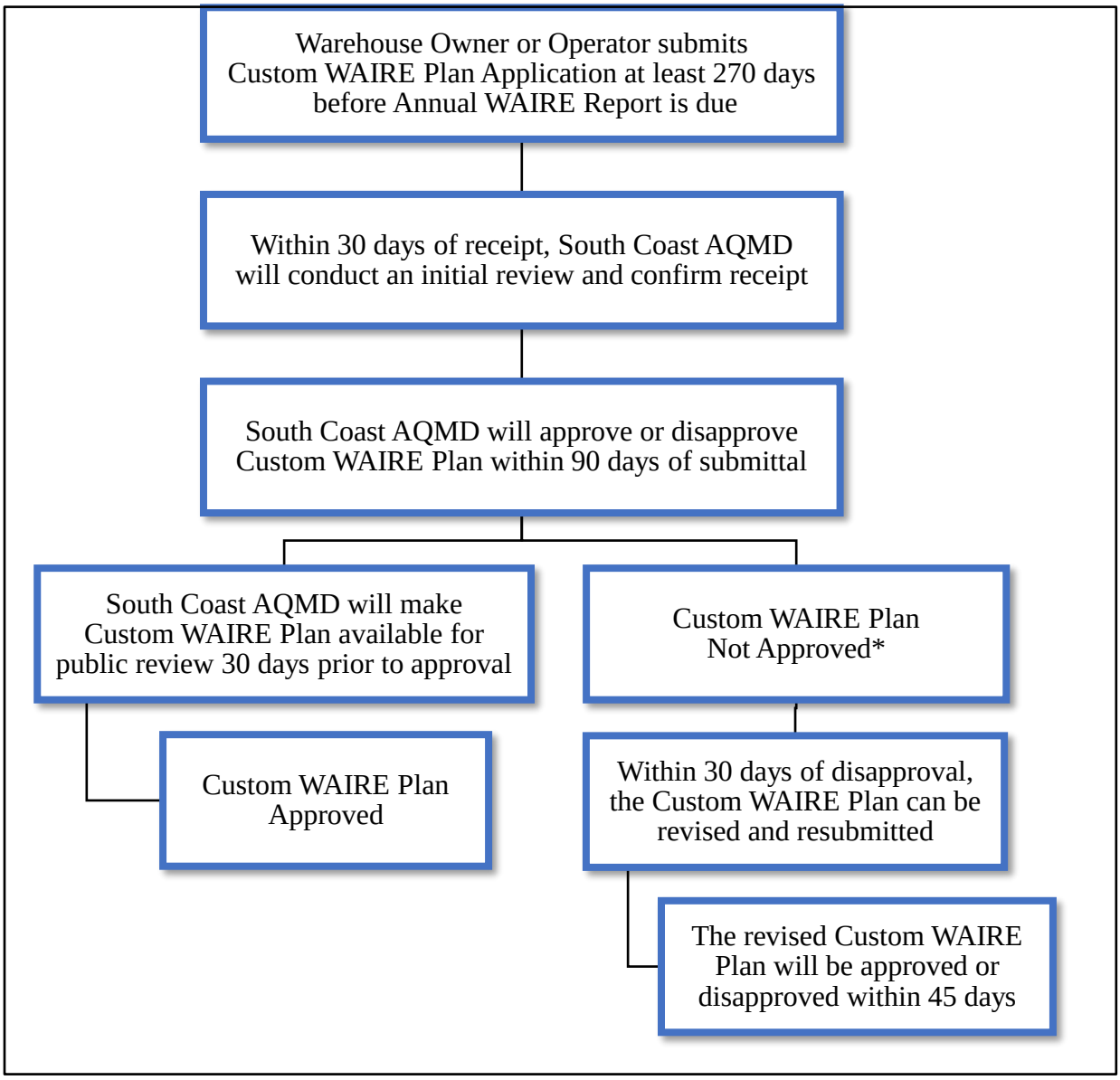
Acquire One NZE Yard Truck = 42 WAIRE Points

Use One NZE Yard Truck for 1,000 hrs in a year = 288 WAIRE Points

[20] Renewable fuels include any non-fossil fuel who carbon intensity is lower than the applicable standard for that year as determined through CARB's Low Carbon Fuel Standards program.

[21] The following key assumptions are used here: $50,000 incremental acquisition cost relative to diesel counterpart, $2,250 incremental annual usage cost relative to diesel (https://cleanairactionplan.org/documents/final-cargo-handling-equipment-che-feasibility-assessment.pdf/), 90% of the NOx emissions benefit as a ZE yard truck, and 100% of the Diesel PM benefit of a ZE yard truck.

Figure 3 – Custom WAIRE Plan Application Process



** A disapproval will identify the deficiencies in the application that must be revised before approval can be considered. Applications that have not been explicitly approved within the review period are presumed to be disapproved.*

Custom WAIRE Plan actions must meet similar criteria to the analysis conducted for the actions and investments included in the WAIRE Menu. Custom WAIRE Plan Applications must include the following elements:

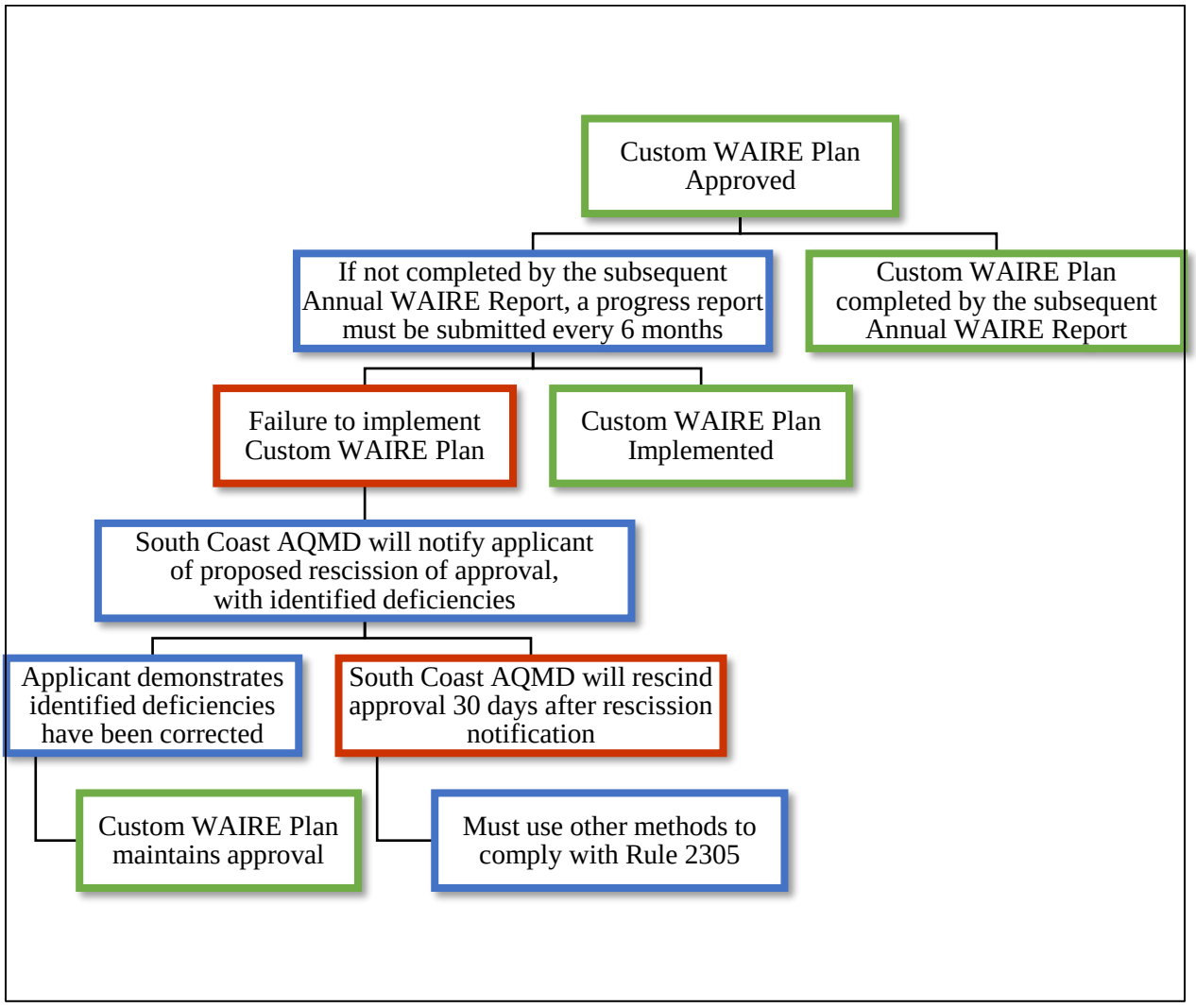
- A demonstration how the proposed action will earn WAIRE Points based on the incremental cost of the action, the NOx emission reductions from the action, and the DPM emission reductions from the action, relative to baseline conditions if the warehouse operator had not completed the action in that compliance period,
    - Baseline conditions should be calculated using the latest emissions estimation methodologies, such as those used in the most recently approved Air Quality Management Plan. The calculation of WAIRE Points from actions in a Custom WAIRE Plan should be consistent with the calculation methodologies included in the WAIRE Menu Technical Report included as Appendix B to the Rule 2305 Staff Report. Emission reductions that go beyond baseline conditions must consider the effect of existing regulations that phase in through time, if applicable.
- A demonstration how WAIRE Points earned from the Custom WAIRE Plan for emission reductions are quantifiable, verifiable, and real,
- A description of how the proposed actions will achieve quantifiable, verifiable, and real NOx and DPM emission reductions as quickly as feasible, but no later than three years after plan approval,
    - All Custom WAIRE Plans must result in emission reductions, or directly facilitate emission reductions. Examples of facilitating projects could include installation of ZE charging infrastructure at an offsite location or acquisition of ZE TRUs that go beyond CARB requirements.
- A quantification of expected NOx and/or DPM emission reductions from the proposed actions within the South Coast AQMD and within three miles of the warehouse,
    - All Custom WAIRE Plan projects, including facilitating projects, must result in verifiable NOx and/or DPM emission reductions within three miles of the warehouse.
- A description of the method to be used to verify that the proposed actions will achieve NOx and/or DPM emission reductions,
    - Example methods documenting how the effectiveness of an action can be verified are included in these Guidelines for WAIRE Menu items.
- A schedule of key milestones showing the increments of progress to complete the proposed actions,
- A description of the location and a map of where the proposed actions will occur,
- Any expected permits or approvals required by other private parties, or South Coast AQMD, or other federal, state, or local government agencies to implement the Custom WAIRE Plan

Custom WAIRE Plan Milestones

The timetable of an approved Custom WAIRE Plan application allows for at least six months to implement the custom WAIRE Plan project (or three and a half months if the application was disapproved, resubmitted, and then approved). Some projects may take longer to implement and could extend beyond the compliance period when the Custom WAIRE Plan application was submitted. In these cases, a progress report must be submitted every six months after the Custom

WAIRE Plan was approved. In the event milestones are not reached, the progress report must explain the conditions that resulted in the milestone not being reached and propose a new milestone date. If in reviewing the progress report, South Coast AQMD staff determines that progress on the approved Custom WAIRE Plan is not adequate, a notice may be sent to the Custom WAIRE Plan applicant advising of the inadequate progress. The Custom WAIRE Plan approval may be rescinded 30 days after the notice if the applicant does not demonstrate how the identified deficiencies have been corrected. Figure 4 shows the Custom WAIRE Plan implementation process.

Figure 4 – Custom WAIRE Plan Implementation



WAIRE MITIGATION FEE

Warehouse operators may earn WAIRE Points by paying a mitigation fee at $1,000 per WAIRE Point, but any of the other methods that can earn WAIRE Points (i.e., the WAIRE Menu, Custom Plans, transferring) can be used to fully satisfy a warehouse operator's WPCO so that no mitigation fees are paid. There is also an additional 6.25% administration fee charged on top of any mitigation fees paid to cover South Coast AQMD's costs of administering the WAIRE Mitigation Program. Mitigation fees and accompanying administrative fees must be submitted through the WAIRE POP system with the AWR. Payments less than $300,000 can be made by e-check or credit card. Payments larger than this must be mailed to South Coast AQMD or submitted in person.

The WAIRE Mitigation Fee Program is expected to provide incentives toward the purchase of NZE and ZE trucks and ZE charging and fueling infrastructure. Warehouse operators may apply for the WAIRE Mitigation Fee Program funds. However, similar to other funding programs, the incentivized vehicle or equipment may not earn WAIRE Points for its acquisition, only for its subsequent use. Further, any ZE charging or fueling infrastructure funded by the WAIRE Mitigation Program must be publicly accessible and cannot solely be for the use of the operator's private fleet.

Projects funded by the WAIRE Mitigation Program will be approved annually or more often by the South Coast AQMD Governing Board and will follow the policies described in the Board Resolution that accompanies Rule 2305 as well as subsequent requirements set out by the Board (e.g., in future solicitations).[22]

WAIRE POINTS TRANSFERS

WAIRE Points can only be transferred under limited situations, and only WAIRE Points in excess of the warehouse operator's WPCO may be transferred. The following are the three sole instances when WAIRE Points may be transferred or banked:

1. Excess WAIRE Points transferred to a warehouse operator's other warehouses:
   If a warehouse operator conducts warehousing activities at more than one warehouse during any single compliance period, then WAIRE Points earned for one warehouse may be used at the other warehouse(s) under the operational control of that same warehouse operator. Only those points earned in excess of a warehouse operator's WPCO at that site may be transferred, and only for the current compliance period. Any WAIRE Points transferred to a different warehouse shall be discounted as shown in the rightmost column in the WAIRE Menu in Table 3 of Rule 2305.

2. WAIRE Points transferred between a warehouse owner and operator:
   A warehouse facility or land owner may voluntarily earn WAIRE Points during a compliance Period using the WAIRE Menu, a Custom WAIRE Plan, by paying a mitigation fee, or may have WAIRE Points transferred to them from the warehouse operator at that site. The warehouse facility or land owner may then transfer these WAIRE Points to any warehouse operator at the site where the WAIRE Points were earned within a three-year period after the points were originally earned. Any warehouse operator using these transferred WAIRE Points to satisfy a

[22] http://www.aqmd.gov/docs/default-source/Agendas/Governing-Board/2021/2021-May7-027.pdf?sfvrsn=10#page=16

WPCO during this three-year period must demonstrate that any onsite improvements or equipment installations that were used to earn the WAIRE Points being transferred are still operational at that warehouse facility in the year that WAIRE Points are used.

a. Warehouse operators that vacate a warehouse before the end of a compliance period may transfer any excess WAIRE Points to the warehouse owner. These Points may then be transferred to the next warehouse operator.

3. Excess WAIRE Points banked for future use at that site:
WAIRE Points in excess of the warehouse operator's WPCO in one compliance period may be banked for use in any of the next three compliance periods. After this time, any remaining banked WAIRE Points will expire and can no longer be used. WAIRE Points banked for future use in this way cannot be transferred to another warehouse. WAIRE Points may not be transferred to a subsequent compliance period if the WAIRE Menu items used to earn WAIRE Points are required by U.S. EPA, CARB, or South Coast AQMD rules and regulations in that subsequent year. An example could include CARB's anticipated TRU rule that could require charging infrastructure at a future date. Installations earlier than CARB requirements could earn Points and be banked for future years. However, the banked Points can no longer be used in any year in which CARB requires those chargers to be installed. Further, if any onsite improvements or equipment installations that were used to originally earn the WAIRE Points are no longer functional, the banked WAIRE Points may not be used to satisfy a WPCO. Finally, if WAIRE Points are earned prior to a warehouse operator's first compliance period, the three-year clock on banked WAIRE Points does not begin until after their first compliance period.
In order to use banked WAIRE Points, the WAIRE Menu item that generated the WAIRE Points must still be onsite and was used for the compliance period that the WAIRE Points are to be used to comply with the WPCO. ~~(Incomplete sentence) For Phase 2 and 3, t~~There is an early action provision that allows for earning WAIRE Points ahead of their initial compliance period, and include a provision for the clock on three year life of the WAIRE Points for those early action WAIRE Points to not begin until after the initial compliance period.

It is the responsibility of the warehouse operator who uses transferred or banked WAIRE Points to keep records documenting how and when the WAIRE Points were originally earned. If WAIRE Points are transferred between the warehouse owner and operator, both entities must keep records documenting the agreement to transfer the WAIRE Points. To avoid any potential disputes, the agreement should be signed by authorized officials for both entities.

EXEMPTIONS

Warehouse operators may be exempt from parts of Rule 2305 in three limited instances. First, warehouse operators who can only use less than 50,000 sq. ft. of a warehouse for warehousing activities are not required to earn any WAIRE Points. However, if the warehouse operator has the same parent company as another warehouse operator in the same building, and collectively they may use more than 50,000 sq. ft., then the exemption does not apply.

Second, warehouse operators with a calculated WPCO <10 are not required to earn any WAIRE Points but will still need to submit required reporting. This exemption is in place to reduce the burden on small warehouse operations with only a small volume of truck trips to their warehouse.

Third, there may be rare instances when a warehouse operator invests in new technology to comply with Rule 2305. If that equipment malfunctions through no fault of the operator, then they may apply for an exemption from the portion of their WPCO for which that action applies. An example could include a warehouse operator who purchases a ZE or NZE truck that experiences a significant manufacturer's defect that renders the truck inoperable for an extended period of time. Applications for this exemption should be submitted to waire-program@aqmd.gov. Applications should include a description of the investment that has the defect, relevant details about the defect, and the number of WAIRE Points anticipated during the current compliance period from that investment for which the operator is seeking an exemption. The warehouse operator's WPCO should not be assumed to be reduced unless South Coast AQMD staff submits an approval of the exemption in writing or email. The application will be reviewed based on evidence provided by the applicant that the vehicle or equipment had defects caused by the manufacturer of the vehicle or equipment, or a defect in the installation of equipment following manufacturer-approved methods. Further, the applicant must demonstrate that they made a good faith effort to have the equipment or vehicle repaired but was unable to do so or do so in a timely manner.

COMPLIANCE PROGRAM

South Coast AQMD will periodically conduct both desktop and field audits for compliance with the WAIRE Program. The South Coast AQMD staff may contact warehouse owners and operators to request further documentation or clarification on submitted WAIRE Program reports. Additionally, South Coast AQMD inspectors may conduct field visits of the warehouse facilities. South Coast AQMD inspections are generally unannounced, and a South Coast AQMD inspector may visit a warehouse facility any time during regular business hours to verify a facility is following recordkeeping requirements and other applicable requirements. Upon arrival, the South Coast AQMD inspector will present proper South Coast AQMD identification and inform a facility representative of the purpose and scope of the inspection. Most inspections are conducted to verify the information submitted on the required WAIRE Program reports. An inspector may also request a tour of the facility to verify the onsite presence of any equipment related to WAIRE Program compliance. It is helpful if a facility representative familiar with the WAIRE Program assist with the inspection, and that an organized collection of the WAIRE Program related documents be readily available either as a hardcopy or digitally.

Some of the records that a South Coast AQMD inspector could inquire about include:

- Current contact information of warehouse operator
- Truck trip count records
- WPCO calculation and plans to earn WAIRE Points
- Copy of Initial Site Information Report
- Copies Annual WAIRE Report(s)
- Copy of any approved Custom WAIRE Plan(s)
- Fleet data (invoices, vehicle registration, model year, fuel type, license plate numbers)
- Information about any onsite energy generation equipment
- Information about any onsite alternative fueling station(s)
- Information about any onsite yard truck(s)
- Information on any air filter systems or filters installed or replaced for the surrounding community

- Copies of exemption documentation
- Copies of lease agreement

If South Coast AQMD staff identify a discrepancy in the warehouse operator's WAIRE Program reporting such as a an issue with the truck trip counts, the reporting metrics submitted, or similar differences, the South Coast AQMD inspector will discuss the issue(s) with the warehouse operator to determine the cause of the issue(s) or require further documentation and enforcement action may be taken. For example, if the warehouse operator submits in the Annual WAIRE Report that there were 100 ZE tractor visits for the compliance period, and if after verifying the 100 tractor VINs the South Coast AQMD staff determines that only 50 of the truck visits were actually ZE tractors, more detail on the truck visits may be required or a further review of the method for accounting for ZE trucks would be needed. If sufficient proof cannot be provided to support the 100 ZE tractor visits reported, then the warehouse operator may need to obtain more WAIRE Points to satisfy their WPCO. Frequently updating and tabulating reporting metrics would limit discrepancies and provide more documentation to support submitted WAIRE Program reports.

APPENDIX A

WAIRE PROGRAM ONLINE PORTAL GUIDANCE

- Under Development -

APPENDIX B

WAIRE MENU TECHNICAL REPORT

OVERVIEW

This technical report describes the methodology used to determine how WAIRE Points are attributed to each of the actions on the WAIRE Menu provided in Rule 2305. Section 1 of this report presents an overview of how the Points are determined within the Menu, while all subsequent sections presents detailed methodologies for each Menu item.

SECTION 1) WAIRE Points Calculation Methodology

This section describes the general methodology used to determine how WAIRE Points are attributed to each of the actions on the WAIRE Menu. While this methodology is used to determine the value of each WAIRE Menu action during the rulemaking process, warehouse operators and/or owners will not need to use this calculation methodology document to determine how to comply with the rule. For compliance, warehouse operators (and in some cases owners if they choose to comply on behalf of their operator) will only need to consult the WAIRE Menu itself to determine how many actions, or how much of each action to complete for compliance.

WAIRE Points may be earned in two ways, through the purchase of near-zero (NZE) and zero emission (ZE) equipment or equipment that facilitates its use, and through the usage of NZE and ZE equipment. WAIRE Points are assigned based on three key parameters, cost, regional emissions reductions, and local emissions reduction. The cost parameter is based on the incrementally higher cost a warehouse operator faces when choosing to purchase NZE/ZE equipment (compared to conventional diesel technology). The regional emissions reduction parameter is based on the reduction in nitrogen oxides (NOx) emissions from using ZE/NZE equipment. The local emissions reduction parameter is based on the reduction in Diesel Particulate Matter (DPM)[1] from using ZE/NZE equipment.

In practice, the actual costs and emission reductions of each implemented action will likely vary for each warehouse operator. Calculating these unique values on a case-by-case basis would impose a considerable administrative burden to both the regulated community and to South Coast AQMD. In order to simplify compliance and administration of Rule 2305, WAIRE Points for each Menu action are determined using representative default values described in the calculation methodology summaries that follow.

Section 1a) WAIRE MENU ANNUALIZED UNITARY METRICS AND BINS

WAIRE Points values in the WAIRE Menu are determined for each action based on a single Annualized Unitary Metric (AUM). The AUM is the default level of implementation used for calculating each WAIRE Menu action's Points. For example, the AUM for the truck acquisition WAIRE Menu action is one truck acquired during the compliance year. The cost and regional and local emissions reductions are calculated for acquiring one truck and used to determine the

1 DPM is both a component of the criteria pollutants PM10 and PM2.5, and a toxic air contaminant. Emissions of DPM from warehouse indirect sources can contribute to high-level, localized pollutant concentrations that can significantly affect air quality and public health for populations near warehouses.

default WAIRE Point value for that Menu action. Warehouse operators use these default Point values in the WAIRE Menu to determine how many Points they earned in total depending on their level of implementation. For example, the default Point value in the Menu for acquiring one ZE class 8 truck is 126 Points. If a warehouse operator acquired five ZE trucks, they would earn a total of 630 Points (126 Points for each truck acquisition). Similarly, for ZE class 8 truck visits, the AUM of 365 visits per year (one per day on average) yields 27 Points in the WAIRE Menu. If a warehouse operator only has 100 ZE class 8 truck visits during a compliance year, they would earn a total of 7.4 Points[2] [(100 ÷ 365) × 27 = 7.4]. The AUM's for each WAIRE Menu action are described in the individual calculation methodology summaries that follow.

WAIRE Points are also calculated using a point binning system to simplify the merging of the cost, regional emission reduction, and local emissions reduction parameters. For the AUM, Points are earned for each $25,000 incremental cost, 25-pound NOx regional emission reduction, and 0.25-pound DPM local emission reduction. Once these three parameters are calculated, their binned points are summed to yield the total default WAIRE Points earned for that action.

Section 1b) COSTS:

The costs for each WAIRE Menu action are based on the annualized incremental costs difference between the new ZE/NZE technology and the costs of the conventional diesel equivalent. Due to existing statutory or regulatory prohibitions, most state incentive funding programs used to offset the higher purchase price of ZE/NZE vehicles and equipment cannot be used to aid in complying with state or federal law or South Coast AQMD rules or regulations[3], and incentive funds are not considered in these costs. However, WAIRE Points may be earned from the usage of incentivized vehicles/equipment. For example, if a warehouse operator owns a fleet of trucks, and they want to purchase a ZE or NZE truck, they will need to decide among two options. First, they could purchase the truck at full price and receive WAIRE Points for that action. Second, they could instead choose to receive incentive funding for that purchase but not earn any WAIRE Points for the truck purchase. In both instances, they would be allowed to receive WAIRE Points for the visits that this truck makes to their warehouse.

2 WAIRE Points are calculated to no more than one decimal place.

3 California Health and Safety Codes 44281(b), 44391.4(a), 44271(c), CCR Title 13, Ch. 8.2 Sec. 2353 (c)(4), Moyer Guidelines Ch. 2, CA Beneficiary Mitigation Plan

Section 1c) REGIONAL EMISSION REDUCTIONS:

Regional emission reductions are calculated in two ways. First, NOx reductions are calculated from using ZE/NZE vehicles and equipment for activities associated with the warehouse. Second, regional NOx emission reduction Points are calculated for WAIRE Menu items affiliated with the acquisition of ZE/NZE vehicles/equipment at a rate of $100,000 per ton of NOx. This is the cost effectiveness threshold that South Coast AQMD utilizes in its Carl Moyer incentive funding program. These regional emission reduction Points are assigned to these acquisition Menu items because if a facility chose to pay that level of funding as a mitigation fee, South Coast AQMD would likely spend the funds using the same cost effectiveness threshold.

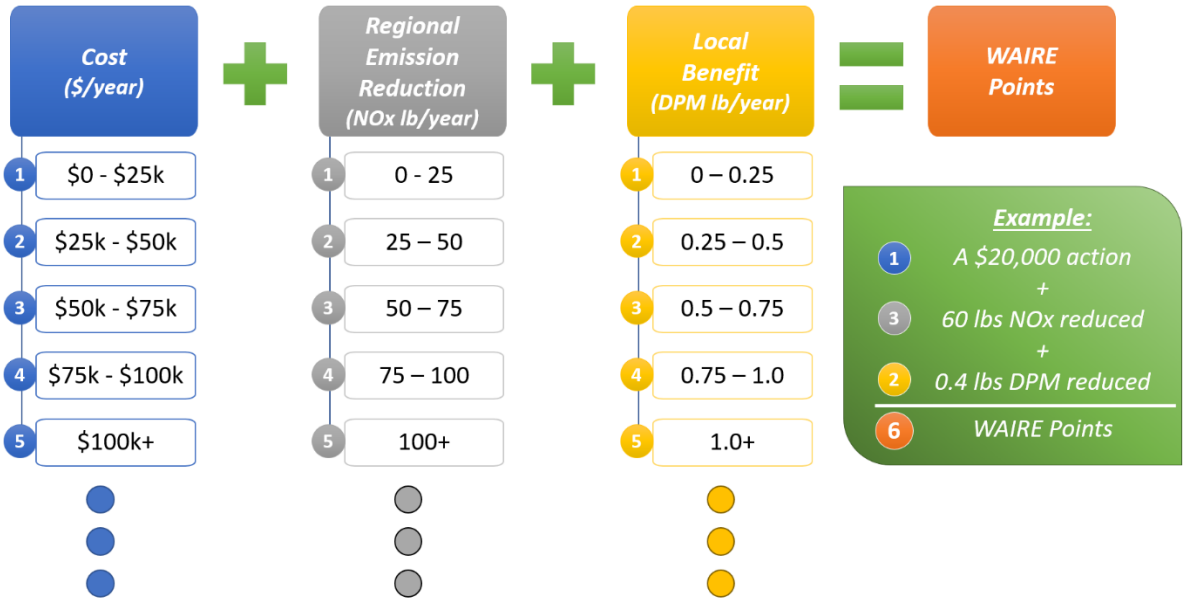
Section 1d) LOCAL EMISSION REDUCTIONS:

Local emission reductions are calculated in a similar manner as regional emission reductions, except that Diesel Particulate Matter (DPM) is used instead of NOx.

Section 1e) EXAMPLE:

Figure 1, below, presents one example of how the calculation methods discussed above would yield the total WAIRE Points earned. In this example, an AUM would cost $20,000 and result in a 60 lbs/year NOx reduction, and a 0.4 lbs/year DPM reduction. Combining the three together would result in a total of 6 WAIRE Points. Specific calculations for each WAIRE Menu action are included in the following sections.

Figure 1: WAIRE Points Calculation



***SECTION 2)* Zero and Near-Zero Emission Truck Visits and Truck Acquisitions**

Description: Two key factors affect the analysis of ZE and NZE trucks – the definitions of ZE and NZE, and the truck class. In the context of Rule 2305, the definition of a ZE truck is the same as CARB's Advanced Clean Trucks Regulation definition. At the time of this writing, CARB's draft definition for ZE truck is one *"with a drivetrain that produces zero exhaust emission of any criteria pollutant (or precursor pollutant) or greenhouse gas under any possible operational modes or conditions."* For Rule 2305 a NZE truck is one in which the engine meets CARB's lowest Optional Low NOx standard at the time of manufacture, which is currently 0.02 g/hp-hr NOx.

In addition to drivetrain technology, trucks are commonly classified based on their Gross Vehicle Weight Rating (GVWR). Throughout this document Class 2b-7 refers to heavy duty trucks with GVWR of 8,501 – 33,000 lbs and Class 8 trucks with GVWR of greater than 33,000 lbs. Table 1 below presents truck classifications.

Table 1. Truck Classes

Truck Class	GVWR (lbs)
Class 2b	8,501 – 10,000
Class 3	10,001 – 14,000
Class 4	14,001 – 16,000
Class 5	16,001 – 19,500
Class 6	19,501 – 26,000
Class 7	26,001 – 33,000
Class 8	33,001 & over

Commercial Availability: The ZE truck market is beginning to grow rapidly with many models entering the commercial market today and many major manufacturers announcing plans for future commercialization of battery-electric and hydrogen fuel cell electric trucks.[4] Some notable manufacturer announcements include: Daimler Class 8 eCascadia, Navistar battery-electric Class 8, Volvo battery-electric VNR Class 8, Tesla's long range battery-electric tractor, BYD's battery-electric Class 6 and 8, Nikola's and Kenworth (in conjunction with Toyota) hydrogen fuel cell tractors, Sea Electric Class 4-8 battery-electric trucks, Lion Electric's Class 6-8 battery-electric trucks, Amazon's order of 100,000 Rivian's battery electric trucks, etc. NZE engines are currently available in two sizes – 11.9 liter and 8.9 liter. Major truck manufacturers offer these engines in different truck classes, including for class 8 regional haul and/or drayage truck operations.

Operation: Trucks that visit warehouses may be owned by the warehouse operator, or by a motor carrier not affiliated with that warehouse. Arrangements for truck visits to the site to

4 A useful reference is the online ZETI tool. https://globaldrivetozero.org/tools/zero-emission-technology-inventory/

deliver or pick up goods is typically made by the owner of the goods, or someone acting on their behalf. As such, each individual truck visiting a warehouse can have a unique operating profile that may not be shared by any other truck visiting that site. One truck may travel 30 miles on the inbound trip, and only two miles on the outbound trip. Another truck may be loaded with goods from multiple warehouses or stores, and determining what portion of a trip to attribute to each warehouse would be impractical. Finally, trucks may idle their engines for short periods while at the warehouse before or after the trailer is dropped off/picked up. For the emissions and cost analyses presented below, input parameters are meant to be broadly applicable and may not reflect any one individual truck trip or truck acquisition.

SECTION 2a) ZE/NZE Truck Acquisitions[5]

ZE/NZE Truck Purchase Prices: Several key references were consulted to estimate incremental purchase prices for NZE and ZE trucks relative to conventional diesel trucks including: CARB's Advanced Clean Truck Regulation (ACT), Standardized Regulatory Impact Assessment (SRIA)[6] and Total Cost of Ownership Discussion Documents[7], California Energy Commission's Revised Transportation Demand Forecast[8], the Ports' Feasibility Study[9], ICF's Intensive Literature Review for Medium and Heavy-Duty Electrification in California[10], NACFE's TCO Calculator[11], as well as data from South Coast AQMD's Carl Moyer Grant Program and CARB's HVIP program. While cost estimates vary somewhat among these references, the single point estimates shown in Table 2 below are consistent with these previous analyses.

Table 2. Incremental Costs for NZE and ZE Truck Purchases

WAIRE Menu Item		**Annualized Unitary Metric**	**Incremental Cost ($/metric)**
Class 8 Truck	NZE	1 truck purchased	$65,000
Class 4-7 Truck			$30,000
Class 8 Truck	ZE		$150,000

5 WAIRE Points can be earned from either truck purchases or truck leases. Points are calculated assuming trucks are purchased.

6 https://ww3.arb.ca.gov/regact/2019/act2019/appc.pdf

7 https://ww3.arb.ca.gov/regact/2019/act2019/apph.pdf

8https://efiling.energy.ca.gov/GetDocument.aspx?tn=230885&DocumentContentId=62525

9 https://cleanairactionplan.org/documents/final-drayage-truck-feasibility-assessment.pdf/

10 https://caletc.com/wp-content/uploads/2019/01/Literature-Review_Final_December_2018.pdf

11 https://nacfe.org/future-technology/medium-duty-electric-trucks-cost-of-ownership/

Class 4-7 Truck			$80,000
Class 2b-3 Truck			$16,000

WAIRE Points for ZE/NZE Truck Acquisitions: Acquisition of NZE Class 8 and Class 4-7 trucks earns 3 and 2 WAIRE Points, respectively. Similarly, the acquisition of ZE Class 8, Class 4-7, and Class 2b-3 trucks earns 6, 4, and 1 WAIRE Points, respectively. In addition, using a cost-effectiveness of $100,000 per ton of NOx, WAIRE Points for regional emission reductions for Class 8 and 4-7 NZE truck acquisitions are 52 and 24 WAIRE Points, respectively. For ZE truck acquisitions, Class 8, 4-7, and 2b-3 earns 120, 64, and 13 WAIRE Points, respectively.

SECTION 2b) Truck Visits

Regional and Local Emission Reductions from ZE/NZE Truck Visits: Key parameters that can affect the emissions estimate from any one individual trip include: trip length, truck class, vehicle powertrain, and vehicle speed. Collecting all the necessary information to calculate precise emissions estimates for each trip is not feasible as it would require 1) instrumenting all trucks with telematics systems that report uniform data, 2) requiring detailed information reporting about truck loads (e.g., how much of the goods in each truck trailer is being transported to each location), and 3) conducting substantial data analysis to determine the emissions associated with each truck trip. Because of these challenges, various models are used to estimate emissions from trucking activity. In particular, CARB's EMFAC model and SCAG's Heavy-Duty Truck Regional Travel Demand model provide emissions estimates in the South Coast AQMD.

EMFAC2017 provides activity and emission rates for on-road vehicles that operate within California. EMFAC categories[12] and their relationship to truck class are shown in Table 3 below. EMFAC categorizes all truck types that are on the road, however the analysis presented here is limited to those categories that are most likely to deliver goods to and from warehouses.

Table 3. EMFAC Truck Categories

EMFAC Category	Description	Truck Class
LHD1 - DSL	Light-Heavy-Duty Trucks (GVWR 8,501-10,000 lbs)	Class 2b-3
LHD1 - GAS		
LHD2 - DSL	Light-Heavy-Duty Trucks (GVWR 8,501-10,000 lbs)	
LHD2 - GAS		
T6 CAIRP Small	Light-Heavy-Duty Trucks (GVWR 10,001-14,000 lbs)	Class 4-6
T6 Instate Small	Medium-Heavy Duty Diesel Instate Truck with GVWR<=26,000 lbs	
T6 OOS Small	Medium-Heavy Duty Diesel Out-of-State Truck with GVWR<=26,000 lbs	
T6 CAIRP Heavy	Medium-Heavy Duty Diesel CA International Registration Plan Truck with GVWR>26,000 lbs	Class 7
T6 Instate Heavy	Medium-Heavy Duty Diesel Instate Truck with GVWR>26,000 lbs	

12 https://ww3.arb.ca.gov/msei/downloads/emfac2017-volume-iii-technical-documentation.pdf (Table 6.1-1)

T6 OOS Heavy	Medium-Heavy Duty Diesel Out-of-State Truck with GVWR>26,000 lbs	
T7 CAIRP	Heavy-Heavy Duty Diesel CA International Registration Plan Truck with GVWR>33,000 lbs	Class 8
T7 NNOOS	Heavy-Heavy Duty Diesel Non-Neighboring Out-of-State Truck with GVWR>33,000 lbs	
T7 NOOS	Heavy-Heavy Duty Diesel Neighboring Out-of-State Truck with GVWR>33,000 lbs	
T7 POLA	Heavy-Heavy Duty Diesel Drayage Truck in South Coast with GVWR>33,000 lbs	
T7 Tractor	Heavy-Heavy Duty Diesel Tractor Truck with GVWR>33,000 lbs	

Baseline weighted averages of NOx and PM10 emission rates[13] for calendar year 2023 for running exhaust (RUNEX), exhaust from engine startups (STREX), and idling exhaust (IDLEX) of the above-mentioned truck categories are presented below.

Table 4. Weighted average emission rates (g/mi for RUNEX, g/trip for STREX, g/vehicle/day for IDLEX)

Truck Class	**NOx**			**DPM**			**Mile/trip[14]**	**Trip/ day/ truck[15]**
	RUNEX	IDLEX	STREX	RUNEX	IDLEX	STREX		
Class 2b-3	0.727	0.888	0.290	0.008	0.013	0	15.3	1.3
Class 4-7	1.079	2.855	2.117	0.007	0.001	0	14.2	5.9
Class 8	2.372	76.203	2.028	0.020	0.027	0	39.9	5.2

13 VMT-weighted, population-weighted and number of starts-weighted averages were computed to equalize the frequency of the values for RUNEX, IDLEX and STREX emission rates, respectively, in the data set by multiplication of each truck category emission rates to its corresponding VMT, population or number of starts and then dividing by the sum of total VMT, population or number of starts.

14 SCAG 2016 RTP mileage rates for medium-heavy (Class 4-7) and heavy-heavy trucks (Class 8)

15 Truck populations from EMFAC and trips/day from SCAG 2016 RTP. A trip is a one-way trip, while a 'visit' to a warehouse includes the incoming trip and the outgoing trip.

The regional and local emission reductions achieved by switching to ZE trucks relative to baseline emissions are calculated using Equation 1 below. While regional emission reductions from switching to NZE trucks is assumed to equal 90% of the reduction compared to ZE trucks, local emission reductions are assumed to be the same between ZE and NZE as NZE trucks are fueled by natural gas and do not emit DPM.

Equation [1]:

$$Emission\ Reduction\ \left(\frac{lb}{trip}\right) = \left[\left(RUNEX\ \left(\frac{g}{mi}\right) \times \frac{mi}{trip}\right) + \left(STREX\ \left(\frac{g}{trip}\right)\right) + \left(\frac{IDLEX\ \left(\frac{g}{day.truck}\right)}{\frac{trip}{day.truck}}\right)\right] \times \frac{1\ lb}{453.592\ g}$$

Results of the calculation for the two truck class categories are presented in Table 5 below.

Table 5. NOx and DPM emission reductions for a single truck trip

Truck Class	**ZE Truck**		**NZE Truck**	
	NOx lb/trip	DPM lb/trip	NOx lb/trip	DPM lb/trip
Class 2b-3	0.027	0.0003	N/A	N/A
Class 4-7	0.040	0.0002	0.036	0.0002
Class 8	0.247	0.002	0.222	0.002

Table 6 below illustrates the method used in determining point values based on regional and local emissions reductions using results in Table 5.

Table 6. NOx and DPM emission reductions for the Annualized Unitary Metric

WAIRE Menu Item		**Annualized Unitary Metric (AUM)**	**Annualized Regional Emission Reductions (lb NOx/AUM)**	**Annualized Local Emission Reductions (lb DPM/AUM)**
Class 8 Truck	NZE	365 truck visits	0.9 × 180.3 = 162.3	1.3
Class 4-7 Truck			0.9 × 29.2 = 26.3	0.1
Class 8 Truck	ZE		0.247 × 2 × 365 = 180.3	0.002 × 2 × 365 = 1.3

Class 4-7 Truck			0.040 × 2 × 365 = 29.2	0.0002 × 2 × 365 = 0.1
Class 2b-3	ZE		0.027 × 2 × 365 = 19.7	0.0003 × 2 × 365 = 0.2

WAIRE Points from ZE/NZE Truck Visit Emission Reductions: For the annualized regional NOx emission reductions, 365 truck visits from Class 8 ZE and NZE trucks will earn 8 and 7 WAIRE Points. Similarly, Class 4-7 ZE and NZE will earn 2 WAIRE Points, and Class 2b-3 ZE will earn 1 WAIRE Point. The associated local DPM emission reductions will earn 6 WAIRE Points for both ZE and NZE Class 8 truck visits, 1 WAIRE Point for both ZE and NZE Class 4-7 truck visits, and 1 WAIRE Point for ZE Class 2b-3.

Costs from ZE/NZE Truck Visits: The incremental cost of a truck visit used in the WAIRE Menu is based on the total cost of ownership of a ZE or NZE truck compared to an equivalent conventional diesel truck, taking into account the estimated total number of trips that truck will take in its useful life. The total cost of ownership (TCO), assuming a 12-year life, for Class 3, 4, 6 and 8 conventional diesel, battery electric, and hydrogen fuel cell trucks were obtained from CARB's Advanced Clean Truck Total Cost of Ownership Discussion Documents. The key components of the TCO include:

(1) Capital cost: vehicle capital cost, taxes associated with the vehicle purchase, financing costs for the vehicle

(2) Fuel cost[16]: The cost of the fuel

(3) Other cost: maintenance costs, midlife costs[17], vehicle registration, and residual values at the end of the truck's operating life

Tables 7, 8, 9, and 10 below present the base TCO data used in this analysis for Class 3, 4, 6, and 8 diesel, battery-electric, and hydrogen fuel cell trucks. The total cost of ownership for Class 6 CNG shown in Table 8 was estimated using a similar approach as Table 9, with modifications made to the incremental purchase cost, fuel cost[18] and fuel economy[19,20]. Maintenance cost of natural gas vehicles were assumed to be about one to two cents per mile greater than for diesel

16 Low Carbon Fuel Standard credits were not included in the analysis presented here.

17 Midlife costs are the cost of rebuilding or replacing major propulsion components due to wear or deterioration. For diesel vehicles, this would be a midlife engine rebuild, for battery-electric vehicles this would be a battery replacement, and for a hydrogen fuel-cell vehicle this would be a fuel cell stack refurbishment.

18 https://nacfe.org/future-technology/medium-duty-electric-trucks-cost-of-ownership/

19 https://afdc.energy.gov/files/u/publication/ng_regional_transport_trucks.pdf (Figure 5)

20 https://www.energy.gov/sites/prod/files/2014/03/f8/deer12_kargul.pdf

vehicles due to more frequent oil changes and inspections, and higher replacement costs for spark plugs and injectors[21]. A summary of the analyses in Tables 7, 8, 9, and 10 is shown in Table 11.

21https://ww3.arb.ca.gov/msprog/tech/techreport/ng_tech_report.pdf

Table 7. Base TCO data for Class 3 trucks[22]

	Diesel	**Battery Electric**	**Hydrogen Fuel Cell**	**Natural Gas NZE**
Annual Miles	15,000	15,000	15,000	TCO information was not found in the literature (Most NZE trucks in this Class are conversions)
Operating Years	12	12	12	
Energy Storage	-	38 kWh	10 kWh/10 kg	
Total Capital Cost	**$53,110**	**$86,568**	**$306,673**	
Average Fuel Cost	$3.74/gal	$0.18/kWh	$8.00/kg	
Average Fuel Economy	23.2 mpg	1.79 mi/kWh	58 mi/kg	
Total Fuel Cost	**$20,817**	**$13,142**	**$25,986**	
Lifetime Maintenance Cost	$23,731	$17,779	$23,731	
Midlife Cost	$0	$0	$42,982	
Registration Fees	$8,331	$7,509	$13,919	
Residual Values	($8,207)	($4,104)	($2,052)	
Total Other Cost	**$23,855**	**$21,204**	**$78,580**	
Total	***$97,782***	***$113,657***	**$410,258**	

22 https://nacfe.org/future-technology/medium-duty-electric-trucks-cost-of-ownership/

Table 8. Base TCO data for Class 4 trucks[23]

	Diesel	Battery Electric	Hydrogen Fuel Cell	Natural Gas NZE
Annual Miles	15,000	15,000		
Operating Years	12	12		
Energy Storage	-	120 kWh		
Total Capital Cost	**50,000**	**100,000**		
Average Fuel Cost	$3.74/gal	$0.17/kWh		
Average Fuel Economy	10 mpg		Class 4 H2 trucks are not expected in the near future	TCO information was not found in the literature
Total Fuel Cost				
Lifetime Maintenance Cost				
Midlife Cost				
Registration Fees				
Residual Values	$500	$5,000		
Total Other Cost				
Total	***$124,229***	***$177,345***		

Table 9. Base TCO data for Class 6 trucks[24]

	Diesel	Battery Electric	Hydrogen Fuel Cell	Natural Gas NZE
Annual Miles	24,000	24,000	24,000	24,000
Operating Years	12	12	12	12
Energy Storage	-	104 kWh	50 kWh/20 kg	-
Total Capital Cost	**$88,705**	**$172,225**	**$330,967**	**$118,705**

23 https://nacfe.org/future-technology/medium-duty-electric-trucks-cost-of-ownership/

24 https://nacfe.org/future-technology/medium-duty-electric-trucks-cost-of-ownership/

Interest Rate	5%			
Financed Period	5 years			
Average Fuel Cost	$3.74/gal	$0.17/kWh	$8.00/kg	$2.42/GGE
Average Fuel Economy	7.4 mpg	1.04 mi/kWh	14.1 mi/kg	6.3 mpg
Total Fuel Cost	**$104,349**	**$33,472**	**$171,398**	**$110,629**
Lifetime Maintenance Cost	$49,138	$36,853	$49,138	$54,898
Midlife Cost	$0	$0	$32,237	$0
Registration Fees	$11,592	$10,860	$15,482	$11,000
Residual Values	($10,477)	($5,239)	($2,619)	($10,477)
Total Other Cost	**$50,252**	**$42,474**	**$94,237**	**$55,421**
Total	***$243,306***	***$248,171***	***$596,603***	***$340,176***

Table 10. Base TCO data for Class 8 trucks[25]

	Diesel	**Battery Electric**	**Hydrogen Fuel Cell**	**Natural Gas NZE**
Annual Miles	54,000	54,000	54,000	68,383
Operating Years	12	12	12	12
Energy Storage	-	510 kWh	10 kWh/10 kg	-
Total Capital Cost	**$167,500**	**$593,662**	**$786,486**	**$192,710**
Interest Rate	5%			12.5%
Financed Period	5 years			
Average Fuel Cost	$3.74/gal	$0.15/kWh	$8.00/kg	$2.92/DGE
Average Fuel Economy	5.9 mpg	0.48	11.2 mi/kg	5.1 mi/DGE
Total Fuel Cost	**$296.381**	**$152,074**	**$486.820**	**$469,831**

25 https://nacfe.org/future-technology/medium-duty-electric-trucks-cost-of-ownership/

Lifetime Maintenance Cost	$95,484	$71,613	$95,484	
Midlife Cost	$0	$42,949	$94,023	
Registration Fees	$27,545	$21,472	$26,548	
Residual Values	($15,453)	($7,727)	($3,863)	
Total Other Cost	**$107,576**	**$128,308**	**$212,192**	
Total	***$571,456***	***$874,044***	***$1,485,498***	***$624,925***

Table 11. Summary of TCO Analyses from Literature Review

Truck Class	Ownership period	Annual Mileage	Diesel	Low-NOx CNG	Battery-Electric	Hydrogen Fuel Cell
Class 3	12	15,000	$97,782		$113,657	$410,258
Class 4	12	15,000	$124,229[1]		$177,345[1]	
Class 6	12	24,000	$243,306[2]	$340,176	$248,171[2]	$596,603[2]
Class 8 (Ports Study)	12	68,383	$598,122[3]	$624,925[3]	$1,063,000[3]	
Class 8 (CARB TCO)	12	54,000	$571,456[2]		$874,044[2]	$1,485,498[2]

1. https://nacfe.org/future-technology/medium-duty-electric-trucks-cost-of-ownership/
2. https://ww3.arb.ca.gov/regact/2019/act2019/apph.pdf
3. https://cleanairactionplan.org/documents/final-drayage-truck-feasibility-assessment.pdf/

Using the reported annual mileages shown in Table 11, costs were calculated on a dollar per mile basis, as shown in Equation 2.

Equation [2]:

$$TCO\ \left(\frac{\$}{mi}\right) = \frac{TCO\ (\$)}{12\ (yr) * Anual\ Mileage\ \left(\frac{mi}{yr}\right)}$$

Table 12. Total Cost of Ownership calculated as $/mi

Truck Class	Diesel	Low-NOx CNG	Battery-Electric	Hydrogen Fuel Cell
Class 3	0.54		0.67	2.28
Class 4	0.69		0.99	
Class 6	0.84	1.18	0.86	2.07
Class 8 (Ports Study)	0.73	0.76	1.30	
Class 8 (CARB TCO)	0.88		1.35	2.29

SCAG's Heavy-Duty Truck Regional Travel Demand model provides an estimate of heavy-duty truck activities within South Coast Air Basin. TCO values on a dollar per trip basis are estimated using SCAG's VMT and trip rates in Table 13.

Table 13. Truck activity data from SCAG's Heavy-Duty Truck Regional Travel Demand Model

Truck Class	VMT (mi/day)	Trips (trip/day)	Mile/trip
Class 2b-3	7,456,000	488,000	15.3
Class 4-7	7,744,000	544,000	14.2
Class 8	12,060,000	302,000	39.9

Equation 3 below illustrates the method used to determine TCOs on a dollar per trip basis using the TCOs ($/mi) in Table 12 and SCAG's mileage rates in Table 13, with results shown in Table 13 equation [3]:

$$TCO\ \left(\frac{\$}{trip}\right) = TCO\ \left(\frac{\$}{mi}\right) \times \frac{mi}{trip}$$

Table 14. Total Cost of Ownership ($/trip)

Truck Class	Diesel	Low-NOx CNG	Battery-Electric	Hydrogen Fuel Cell
Class 3	8.31		10.28	34.96

Class 4	9.80		13.99	
Class 6	12.00	16.77	12.24	29.42
Class 8 (Ports Study)	29.08	30.39	51.69	
Class 8 (CARB TCO)	35.19		53.82	91.47

Although the TCO analyses above assume a 12-year useful life for a truck, motor carriers may require shorter periods over which they absorb the incrementally higher costs of ZE or NZE trucks compared to diesel. The analysis here therefore assumes that this incremental cost is absorbed over a 3-year period, instead of the full 12-year useful life. The incremental cost is therefore multiplied by four (12 ÷ 3 = 4) to determine the default cost for truck visits.

Table 15. Annualized Incremental Costs

Truck Class		**Annualized Unitary Metric**	**Annualized Incremental Cost ($/metric)**
Class 8	NZE	365 truck visits**	($30.39 - $29.08) × 4 × 2 × 365 = $3,825
Class 4-7*			($16.77 - $12.00) × 4 × 2 × 365 = $13,928
Class 8	ZE		($53.82 - $35.19) × 4 × 2 × 365 = $54,400
Class 4-7*			($12.24 - $12.00) × 4 × 2 × 365 = $701
Class 2b-3			($10.28 - $8.31) × 4 × 2 × 365 = $5,752

*In this analysis, Class 6 TCOs were used for the Class 4-7 category in the WAIRE Menu
** One visit equals two one-way trips

WAIRE Points for ZE/NZE Truck Visit Costs: Based on the costs presented in Table 15, the number of WAIRE Points earned for ZE Class 8, Class 4-7, and Class 2b-3 truck visits are 3, 1, and 1, respectively. One WAIRE Point is earned for both NZE Class 8 and Class 4-7 truck visits.

Total WAIRE Points for ZE/NZE Truck Visits: The total WAIRE Points for truck visits includes Points from the cost, regional emission reductions, and local emission reductions. In addition, because most of the emissions associated with warehouses comes from trucks visits, a multiplier of three is applied to the summed Points to encourage operators to choose this option, and to promote a more rapid return on investment for the purchase of ZE/NZE trucks. For example, for 365 class 8 ZE truck visits, a warehouse would earn: 8 Points for regional, 6 Points for Local, and 3 Points for cost, with a sub-total of 17 Points. The final total for this Menu item would by 51 Points (17 × 3).

SECTION 3) Electric Charger Usage and Installation

Description: ZE battery electric trucks require specialized charging infrastructure. Installing this infrastructure can require facility electrical upgrades, dedication of space for electrical equipment and vehicle parking, permitting with local authorities, and plans to optimize charger usage. The charging stations themselves range in size and are typically rated based on the amount of kW that can be dispensed. Higher powered charging stations (>=350 kW) are just now entering the market, and may require significant construction. On the usage side, the cost of the electricity can vary depending on the time of day when trucks are charged, the kW charging level, and the level of demand charges. Utilities are introducing new rate structures for the use of these stations to address this new market need. Trucks that would use charging infrastructure at a warehouse are likely to travel to destinations unrelated to the warehouse itself, and providing this infrastructure can facilitate greater usage of ZE trucks.

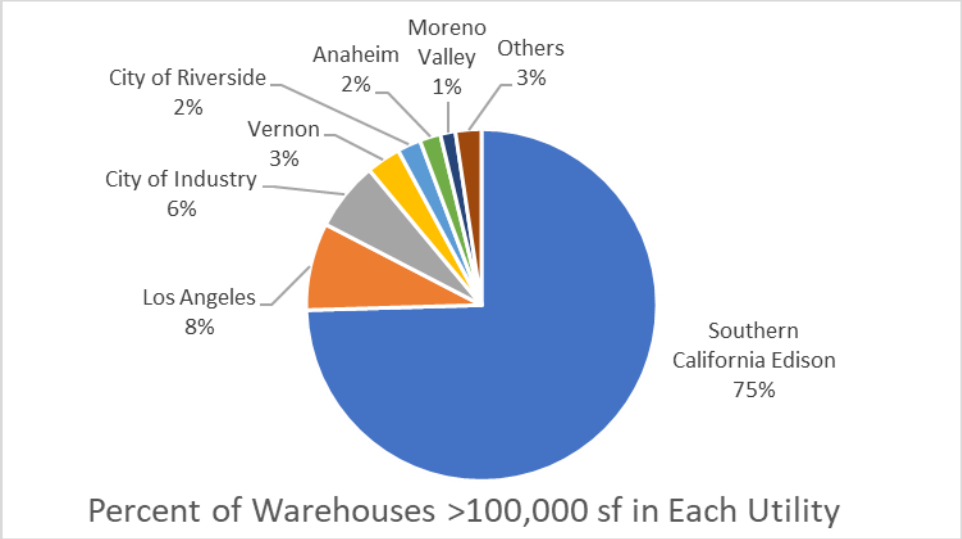
Commercial Availability: Several different manufacturers sell EVSE at a variety of power levels (e.g., Level 2, higher rate chargers, etc.), including with optional power management software that govern how trucks are charged. At the current early stage of commercialization and demonstration of electric trucks, the higher power chargers used for heavy duty vehicle charging have not yet followed a common standard, and proprietary charging systems are commonly tailored to each vehicle. This is expected to change in the near future with the development of a common High Power Charging for Commercial Vehicles standard by the CharIN[26] organization. In addition, local utilities and land use agencies are developing programs specifically focused on charging infrastructure upgrades. Notable examples include the Charge Ready Transport program from Southern California Edison (SCE)[27], the Commercial EV Charging Station Rebate Program from the Los Angeles Department of Water and Power (LADWP)[28], and permit streamlining efforts from many local permitting agencies[29]. SCE and LADWP collectively provide power to >80% of warehouses that may be included in Rule 2305 (see chart).

26 http://www.charinev.org/hpccv - CharIN members include most major vehicle manufacturers as well as many major energy and charging infrastructure companies.

27 https://www.sce.com/business/electric-cars/charge-ready-transport

28 www.ladwp.com/ladwp/faces/ladwp/commercial/c-savemoney/c-sm-rebatesandprograms/c-sm-rp-commevstation

29 http://www.business.ca.gov/ZEVReadiness



SECTION 3a) Charger Usage

Emissions: While charging infrastructure on its own does not reduce emissions, this equipment does facilitate emissions reductions by providing additional locations for electric vehicles to obtain power and making it possible for their increased use. However, similar to the calculations for truck acquisitions, regional emission WAIRE Points are earned at a $100,000 per ton of NOx cost effectiveness level. Both regional and local emission reductions Points are earned when charging stations are used. The amount of regional NO_x emissions reductions is tied to the total amount of dispensed electricity, using default electric vehicle efficiencies and emission rates. The amount of local DPM emissions reductions is set equal to six miles of travel for every charging event[30]. The Annualized Unitary Metric (AUM) is set at 165,000 kWh, equal to about 450 kWh per day, or enough for five separate two hour-long charging events per day on a 50 kW charger, or to recharge one truck with a 500 kWh battery.

The tables and equations below illustrate the methods used to determine Point values based on regional and local emissions reductions.

Table 16. Electric Vehicle Efficiencies[31], Emission Rates[32], and Emissions Reductions

Truck Category	Efficiency	Emission Rate	Emissions Reductions

31 CARB Advanced Clean Truck – Draft Standardized Regulatory Impact Assessment (SRIA), 8/8/2019 https://ww3.arb.ca.gov/regact/2019/act2019/appc.pdf

32 https://www.arb.ca.gov/emfac/2017/, emission rates are from calendar year 2023

	mile/kWh	NOx g/mile	DPM g/mile	lb NOx/kWh	lb DPM/kWh
Class 4-5	1.26	1.08	0.007	0.003	0.00002
Class 6-7	0.8	1.08	0.007	0.002	0.00001
Class 8	0.62	2.37	0.02	0.003	0.00003

Equation [4]: NOx reductions = (mile/kWh) × (g/mile) × 165,000 kWh/yr ÷ 453.59 (g/lb)

Equation 1 (Class 4-5): 1.26 × 1.08 × 165,000 ÷ 453.59 = 495 lb NOx

Equation 1 (Class 6-7): 0.8 × 1.08 × 165,000 ÷ 453.59 = 314 lb NOx

Equation 1 (Class 8): 0.62 × 2.37 × 165,000 ÷ 453.59 = 535 lb NOx

Equation [5]: DPM reductions = (mile/kWh) × (g/mile) × 165,000 kWh/yr ÷ 453.59 (g/lb)

Equation 2 (Class 4-5): 1.26 × 0.007 × 165,000 ÷ *453.59* = 3.2 lb DPM

Equation 2 (Class 6-7): 0.8 × 0.007 × 165,000 ÷ *453.59* = 2.0 lb DPM

Equation 2 (Class 8): 0.62 × 0.02 × 165,000 ÷ *453.59* = 4.5 lb DPM

WAIRE Points from Charging Station Usage Emission Reductions: Emission reductions vary for each class of truck. For the WAIRE Menu, the regional and local emission reductions from class 8 trucks are used. Regional emission reductions therefore result in 22 WAIRE Points, while local emission reductions result in 18 WAIRE Points.

Costs of Using Charging Stations: Over the past year staff worked closely with multiple utilities to understand their new commercial EV charging rate structures and developed estimates of the average cost of electricity per kWh. As noted above, about three quarters of all warehouses potentially subject to the rule are located within SCE's jurisdiction. For this analysis, multiple scenarios were evaluated for a five concurrent two hour long charging events per day on a 50 kW chargers. Table 17 reflects the expected charging rate and the average electricity rate for two most appropriate SCE rate schedule for heavy-duty EV charging. The average cost assumes an equal amount of charging in each time window.

Table 17. Annual Average Cost of Electricity* – Two Key SCE Rate Schedules for Charging Stations South Coast AQMD Staff Analysis

Charging Window	SCE TOU-EV-9	SCE TOU-8-RTP
	$/kWh *	$/kWh **
On-Peak	**0.34**	**0.28**
Mid-peak	**0.16**	**0.25**
Off-peak	**0.14**	**0.23**

* Demand charges and voltage discount are zero for TOU-EV-9

**Demand charges contributes to 40% of total annual electricity cost – Voltage discount included

***These costs do not account for any LCFS revenue that a facility may receive. The LCFS value may vary depending on market conditions but can be more than $0.10/kWh.[33]

In LADWP jurisdiction the electricity rate can range between $0.11-0.3 $/kWh for charging heavy-duty vehicles depending on load factor, daily charging hours, and charging capacity. The provided range by LADWP staff is consistent with the rates provided in Table 5.

Using the $0.21 $/kWh rate above, and AUM of 165,000 kWh per year for a charging station, the total annual cost of electricity for the warehouse is $34,650, equal to two WAIRE Points.

SECTION 3b) Charger Installation

Costs to Install Charging Stations: Charging infrastructure costs can vary greatly from site to site. The analysis presented here was informed by staff discussions with charger providers, utilities, other industry stakeholders, data from current South Coast AQMD funded projects, and multiple studies (referenced below). Table 18 presents a summary of the range of costs for purchasing and installing different EVSEs.

Electrification projects require site-specific planning and sometimes can take more than one year to implement. Because of this potentially extended period, the charging infrastructure installation WAIRE Menu item includes project milestones to allow warehouses to earn Points for partial completion of charger installation during a compliance year. Three milestones that are common to all charging station projects include purchasing the Electric Vehicle Supply Equipment (EVSE), construction mobilization, and final permit sign off & charger energization. In order to account for splitting charger installations into two separate milestones, it is assumed that the

33 https://ww3.arb.ca.gov/regact/2019/act2019/appc.pdf

construction mobilization milestone will require up to $10,000 of the total installation cost, and the remaining cost is incurred during construction and prior to final permit sign-off.

Table 18. Charging Infrastructure Installation Cost Ranges, and Key Incentives/Rebates Programs

Charging Installation Activity	**Charger Ranges**	**Cost Range [A-D]**
		$ per charger
EVSE Purchase	150-350 kW	60,000 – 140,000
	51-149 kW	30,000 – 60,000
	19.2-50 kW	10,000 – 30,000
	Up to 19.2 kW	3,000 – 5,000
Charger Installation[1]	19.2-350 kW	10,000 – 80,000
	Level 2	5,000 – 10,000

Notes:

1. Installation cost for one charger includes electrical service extension, permitting, labor costs, and trenching to lay cables

References:

A. Charging the Future: Challenges and Opportunities for Electric Vehicle Adoption, Henry Lee and Alex Clark, August 2018

B. Estimating Electric Vehicle Charging Infrastructure Costs across Major U.S. Metropolitan Areas. Michael Nicolas, August 2019

C. Rocky Mountain Institute Report, https://www.greenbiz.com/blog/2014/05/07/rmi-whats-true-cost-ev-charging-stations, 2019

D. CARB Advanced Clean Truck - Standardized Regulatory Impact Assessment (SRIA), August 2019

WAIRE Points from Charging Station Installations: Table 19 below summarizes the Points that a warehouse would earn for purchasing an EVSE and installing it. Similar to truck acquisitions, regional emission Points are assigned at a $100,000 per ton of NOx cost effectiveness.

Table 19. Summary of WAIRE Points Earned for Installing Charging Infrastructure

Charger Installation Activity	Cost Points	Regional Emissions Points	Total WAIRE Points
1 EVSE Purchased	6	112	118
	3	48	51
	2	24	26
	1	4	5
1 construction project/ Construction Mobilization	1	8	9
	1	48	5
1 construction project/ Final Permit Sign Off & Charger Energization	3	56	59
	1	48	59

SECTION 4) **Hydrogen Fueling Station Installation and Usage**

Description: Hydrogen refueling stations (HRS) are used to supply fuel to vehicles with hydrogen fuel cell drivetrains. An HRS is composed of storage and dispensing units and can sometimes include a production unit if the hydrogen is produced on site. If the hydrogen is produced on site or delivered to the station at an intermediary pressure or in liquid state, intermediary storage is also needed along with a compression system.

Commercial Availability: While construction of hydrogen fueling stations has been increasing, with 43 now operating in the state[34], they are primarily focused on the light duty vehicle market, or in some cases for transit buses. However, some Class 8 truck manufacturers are actively pursuing the development and commercialization of hydrogen fuel cell trucks over the next few years, including Toyota, Kenworth, Hyundai, and Nikola. Fueling infrastructure will be a critical component to facilitate these new ZE trucks.

Hydrogen Station Installation Costs: Hydrogen prices are influenced by the cost of production, distribution, and sales, among other factors. In addition to AB 8 and CARB's Scoping Plan, the recently-updated Low Carbon Fuel Standard, Executive Orders B-16-2012 and B-48-18 provide strong policy drivers for accelerating commercialization of fuel cell vehicles and their associated hydrogen fuel station network.

Table 20 below presents a summary of costs associated with developing a hydrogen fueling station from literature review and discussion with stakeholders. In this context, total capital cost includes site design and engineering, permitting, equipment, project management, and labor costs.

34 www.veloz.org

Table 20. Hydrogen Fueling Station Costs

	Capacity (kg/day)	Cost ($)	$/Capacity ($/kg/day)	Source
			5000-10,000	CARB Total Cost of ownership Discussion Documents[35]
Gaseous H2 LDV fueling system at 700 bar	250	1,725,000	6,900	Moyer Granted Project for Sunline Transit- EPC Design
Gaseous H2 Station- 700 bar Cascade dispensing	700	3,065,724	4,380	Argonne National Lab Heavy
Gaseous H2 Station- 700 bar Booster compressor	700	3,140,211	4,486	Duty Refueling Model, (2016 Dollar)[36]
Gaseous H2 Station- 350 bar Cascade dispensing	700	2,029,488	2,899	
Liquid H2 Station- 700 bar via vaporization/compression	700	2,421,134	3,459	Argonne National Lab Heavy Duty Refueling Station Model,
Liquid H2 Station- 350 bar via vaporization/compression	700	1,430,748	2,044	(2016 Dollars)[2]
Liquid H2 Station- 700 bar via LH2 pump/vaporization	700	1,541,243	2,202	
Liquid H2 Station- 350 bar via LH2 pump/vaporization	700	1,145,634	1,637	
Onsite H2 Production	7257.5	16,500,000	2,274	Industry stakeholder input
Onsite H2 Production	600	5,000,000	8,333	Industry stakeholder input

35 https://ww3.arb.ca.gov/regact/2019/act2019/apph.pdf

36 https://hdsam.es.anl.gov/index.php?content=hdrsam

WAIRE Points for Hydrogen Station Installation: For the WAIRE Menu an onsite hydrogen fueling station with a capacity of 700kg/day with delivered hydrogen was assumed to cost $2 million. This would yield 80 WAIRE Points. At a cost effectiveness of $100,000 per ton of NOx, an additional 1600 Points are earned for regional emissions.

Emission Reductions from Hydrogen Usage: Annualized regional NOx emission reductions and local DPM emission reductions were set to be same as the reductions achieved by usage of onsite electric charger stations at 535 lb NOx/yr and 4.5 lb DPM/yr. Details of the calculation can be found in Section 3 of this report.

Hydrogen Fuel Costs: To determine the annualized unitary metric (AUM) for dispensed hydrogen, a back calculation was conducted based on the amount of regional NOx emissions:

Equation [6]:

$$Total\ kg\ of\ Dispensed\ H_2 = 535\ \left(\frac{lb}{yr}\right) \times 453.59\ \left(\frac{gr}{lb}\right)\ \times \frac{1}{2.372\ \left(\frac{g}{mi}\right) \times 16.63\ \left(\frac{mi}{kg\ H_2}\right)}$$

$$= 6{,}152\,\frac{kg}{yr}$$

Where, 2.372 (g/mi) is the VMT weighted average of NOx running exhaust emission rate of Class 8 trucks considered in this analysis including T7 CAIRP, T7 NNOOS, T7 NOOS, T7 POLA and T7 Tractor. 16.63 (mi/kg) is the reported fuel economy for a class 8 fuel cell truck[37]. Given the total kg of dispensed hydrogen calculated above and a retail price of $10/kg, the annual cost will be $61,520.

WAIRE Points for Dispensed Hydrogen: Based on the emission reductions stated above, 22 and 18 Points are earned respectively for regional NOx and local DPM. Cost Points would contribute another 3 Points, for a total of 43 Points for 6,152 kg of H_2 dispensed.

SECTION 5) **Zero Emissions Yard Truck Acquisition and Usage**

Description: Yard trucks (also called yard tractors, terminal trucks, hostlers, yard jockeys, or yard goats) move trailers and containers around warehouse facilities. Most yard trucks at

37 https://ww3.arb.ca.gov/regact/2019/act2019/appc.pdf

warehouse facilities are diesel fueled and emit NOx, DPM, and other pollutants. Duty cycles for yard trucks vary depending on use, with heavier use at railyards and port facilities and lighter use typically at warehouses and manufacturing plants, as defined by hours of use and diesel consumption rates. CARB has limited population data for about 1,100 yard tractors operating statewide through its DOORS reporting program for off-road vehicles, but it is unclear how many of these operate at warehouses in South Coast AQMD. In addition, many yard tractors can be on-road vehicles, which are not required to be reported through the DOORS system. For example, about two thirds of the roughly 1,600 yard tractors at the ports of Los Angeles and Long Beach are on-road vehicles.

Commercial Availability: Many battery-electric yard tractor demonstration projects have taken place in the past several years, including in the South Coast AQMD. Following these efforts, multiple manufacturers have begun offering battery-electric ZE yard trucks for sale commercially including OrangeEV, Kalmar Ottawa, and BYD.

Operation: Operation of yard trucks can be tracked by hours of use, with hourly usage varying from <1,000 hours/year up to 6,000 hours/year. The diesel reductions were calculated by using the horse power, hours of use, the load factor, and the pollutant emission factor.

SECTION 5a) ZE Yard Truck Acquisition

WAIRE Points from ZE Yard Truck Acquisition: ZE yard trucks currently cost about $310,000 while their diesel equivalent costs about $100,000[38]. This incremental cost of $210,000 would earn nine WAIRE Points per ZE yard truck purchased. Similar to the methods used for on-road truck acquisitions, at $100,000 per ton cost effectiveness, a ZE yard truck acquisition would earn 168 Points for regional emission reductions.

38 https://cleanairactionplan.org/documents/final-cargo-handling-equipment-che-feasibility-assessment.pdf/

SECTION 5b) ZE Yard Truck Usage

Emissions: From the DOORS data, the most common yard trucks operate a 175 hp, Tier 3 engine. Table 21 below shows the emission factors from the Carl Moyer Guidelines[39] for this type of yard truck. Assuming that this type of yard truck operates 1,000 hours per year, and has operated for ten years, the emission reductions from switching to a ZE yard truck are shown in Equation 7 below.

Table 21. Emission Factors for a Tier 3 Yard Truck

Pollutant	Emission Factor (EF) g/hp-hr	Deterioration Rate (DR) g/hp-hr-hr	Load Factor (LF)
NOx	2.32	0.00003	0.39
DPM	0.088	0.0000044	

Equation [7]

$$Emissions = (hp) \times (LF) \times \left[\left((total\ hrs\ of\ use) \times (DR)\right) + (EF)\right] \times (hrs\ of\ use) \div 453.59\left(\frac{g}{lb}\right)$$

Equation 7 NOx: 175 × 0.39 × [((10 × 1,000) × 0.00003) + 2.32] × 1,000 ÷ 453.59 = 394 lbs
Equation 7 DPM: 175 × 0.39 × [((10 × 1,000) × 0.0000044) + 0.088] × 1,000 ÷ 453.59 = 19.9 lbs

Costs: Although purchase prices for ZE yard trucks are higher than their diesel equivalent, once purchased the operational costs are expected to be lower. An analysis by the ports of Long Beach and Los Angeles evaluated the Total Cost of Ownership (TCO) for battery-electric ZE yard trucks in comparison to diesel[40]. This analysis found a TCO for ZE yard trucks to be about $450,000 (not including infrastructure costs) while equivalent diesel had a TCO of about

39 https://ww3.arb.ca.gov/msprog/moyer/guidelines/current.htm

40https://cleanairactionplan.org/documents/final-cargo-handling-equipment-che-feasibility-assessment.pdf/

$375,000. Assuming a ~12,000 useful life of a yard truck, the annual incremental cost of operating a ZE yard truck for 1,000 hours is shown in Equation 8.

Equation [8]: ($450,000 - $375,000) × 1,000 hrs ÷ 12,000 hrs = $6,250

WAIRE Points from Using ZE Yard Trucks: Following the results from Equation 6, using a ZE yard truck would earn 16 Points for regional emission reductions and 80 Points for local emission reductions. One cost Point would be earned following the results of Equation 7. Similar to the approach for on-road truck visits, a multiplier of three is applied to the sum of cost, regional, and local Points. Therefore the total Points for 1,000 hours of ZE yard truck usage is: (16 + 80 + 1) × 3 = 291 Points.

SECTION 6) Transport Refrigeration Unit Plug (TRU) Acquisition and Usage

Description:

TRUs are truck or trailer installed refrigeration systems used at cold storage and distribution center warehouses to transport and temporarily store perishable goods and products. Most of the 7,400 truck and 166,000 trailer TRUs that operate in California are powered by diesel-fueled internal combustion engines (ICEs)[41] which emit about 5.5 tons of NOx and 0.2 tons of diesel particulate matter (DPM) daily[42]. Newer TRU technology allow zero emission operations by plugging hybrid and battery electric models into TRU charging infrastructure at warehouses and other destinations. CARB is currently developing a new truck TRU regulation as well as a separate trailer TRU regulation which, among other requirements, could mandate:

- installation of charging infrastructure, and
- truck TRU fleets to annually turn over a portion of their fleet to full ZE technology.

WAIRE Points may only be earned for actions beyond any adopted rules and regulations from U.S. EPA, CARB, or South Coast AQMD. If CARB's previously proposed truck TRU regulation is adopted in the coming years,[43] WAIRE Points could only be earned for the installation of TRU plug infrastructure and TRU plug usage beyond CARB requirements, or potentially through a Custom WAIRE Plan thereafter that would demonstrate how actions taken go beyond CARB rules.

Commercial Availability:

Current zero emission operation capable TRUs are: plug-in and hybrid (eTRU); battery-electric; cryogenic; and hydrogen fuel cell. All except the hydrogen fuel cell technologies are commercially available, and are offered for sale commercially by such manufacturers as Advanced Energy Machines, Air Liquide, Boreas, Carrier, Electric Reefer Solutions, and

41 https://ww2.arb.ca.gov/sites/default/files/classic//cc/cold-storage/documents/slidesworkshop82019.pdf

42 https://ww2.arb.ca.gov/resources/documents/2020-mobile-source-strategy

43 CARB has proposed bifurcating the TRU regulation, with rulemaking in 2021 focusing on TRU trucks, and new emission standards, and later rulemaking focusing on ZE trailers.

Thermo King. Additionally, there are manufacturers and firms that focus solely on the electric plug-in infrastructure such CleanFutures and Shorepower Technologies[44].

Operation: Electric zero emission trailer TRUs and truck TRUs operate using an onboard battery, or via power from the electrical grid if they are plugged into a charger. Hybrid trailer TRUs may operate via a diesel engine when in transit, and in zero emissions mode while plugged into a charger. Charger operators may claim LCFS credits for the electricity dispensed for TRUs, potentially at a level that fully offsets the cost of electricity.[45] Charger operators are therefore expected to track the total amount of kWh of charger usage for TRUs when they obtain LCFS credits. Plug usage can be tracked by hours of use, 1,460 hours of annual usage or approximately 4 hours per day of TRU plug usage was determined from the 2023 baseline of the TRU ATCM. The 4 hour average use is attributed to truck dwell time at warehouses or delivery destinations. Diesel emission reductions were calculated by using the horse power, annual hours of use, the load factor, and the pollutant emission factor[46].

SECTION 6a) TRU Plug Acquisition and Installation

WAIRE Points from TRU Plug Acquisition and Installation: A TRU plug installation costs approximately $13,600 which includes a Level 2 charger, equipment, design, construction, and installation costs[47]. Using a similar methodology as is described for installing chargers for vehicles in this document, acquisition and installation of a single TRU plug could earn a total of 15 WAIRE Points, with 1 Point for each TRU plug purchased, beginning construction, and receiving final permit sign-off/charger energization. Similar to truck acquisitions, regional emission Points are assigned at a $100,000 per ton of NOx cost effectiveness, resulting in an additional 12 Points.

44 https://ww2.arb.ca.gov/sites/default/files/classic//cc/cold-storage/documents/clean_tru_technology_webinar_slides_handout.pdf

45 https://ww2.arb.ca.gov/sites/default/files/2020-08/Preliminary%20TRU%20Cost%20Doc%2008202020.pdf

46 https://ww2.arb.ca.gov/sites/default/files/classic//cc/cold-storage/documents/tru_healthanalysisslidesworkshop10312019.pdf

47 https://ww2.arb.ca.gov/sites/default/files/2020-08/Preliminary%20TRU%20Cost%20Doc%2008202020.pdf

SECTION 6b) TRU Plug Usage

Emissions: The 2023 calendar year weighted average emission factors for the South Coast AQMD was used in Equation 1, to calculate the default annual NOx and DPM emission reductions from trailer and truck eTRUs plugging in. The AUM is set at 10,658 kWh, equal to an eTRU plugged in 4 hours per day for 365 days and drawing 7.3 kW of power.[48]

Equation [1]

$$Emissions = (annual\ hours\ of\ use) \times (Pollutant\ Emission\ factor) \div 453.59(\frac{g}{lb})$$

Equation 1 NOx: 1,460 × 12.60 ÷ 453.59 = 40.6 lbs
Equation 1 DPM: 1,460 × 0.53 ÷ 453.59 = 1.7 lbs

Costs: Using the AUM of 10,658 kWh, and the $0.18/kWh rate for electricity calculated for charging station usage in this document (and not considering any potential offset from LCFS credits), the average annual cost to operate a TRU plug is shown in Equation 2.

Equation [2]: ($0.21 /kWh) × 10,658 kWh = $2,238.18

WAIRE Points from Using ZE TRUs: Following the results from Equation 1, using a TRU plug would earn 2 Points for regional emission reductions and 7 Points for local emission reductions. One cost Point would be earned following the results of Equation 2. Similar to the approach for other WAIRE action usage or visits, for replacing diesel-fueled equipment/vehicles, a multiplier of three is applied to the sum of cost, regional, and local Points. Therefore, the total Points for 10,658 kWh from TRU charging is: (2 + 7 + 1) = 10 Points.

48 https://ww2.arb.ca.gov/sites/default/files/2020-08/Preliminary%20TRU%20Cost%20Doc%2008202020.pdf

SECTION 7) Solar Panel System Acquisition and Usage

Description:

Solar panel systems are electric energy generation systems that are composed of the solar panels which collect and convert solar radiation to direct current (DC) power, the racking system which mount the panels and equipment to a rooftop or carport, and the inverter which convert the DC power to alternating current (AC) power. The installations of solar panel systems on warehouse rooftops and carports is an increasing trend which provide renewable power for both warehouse usage and for sale back to the grid. Many commercial buildings with significant rooftop or parking area spaces are incorporating solar panel systems into their operations for financial savings. California is leading the nation with over 600,000 commercial buildings being equipped with solar panel systems, with a solar market penetration of about 2.5%[49]. In the last several years, there have been many technology advancements in solar panels that have made them lighter, more efficient, and more flexible which allows for them to be installed in more applications that have led to a decrease in overall installation costs.

Commercial Availability:

Solar panel systems have wide commercially available throughout California with hundreds of manufacturers and installers who offer a range options for system sizes and component configurations.

Operation:

To analyze the installation and use of solar panel systems, the median solar panel system size was set at 100 kW based on a literature review of Lawrence Berkeley National Laboratory's (LBNL) annual Tracking the Sun Report[50]. The 100 kW solar system parameter was inputted into the National Renewable Energy Laboratory's (NREL) PVWatts[51] calculator specifying a region in the South Coast AQMD jurisdiction which resulted in an annual estimated electrical generation of 165,000 kWh. The 100 kW solar panel system and the 165,000 kWh estimated electrical generation serve as the annual unitary metric (AUM) for solar panel system installation and usage, respectively.

49 https://emp.lbl.gov/webinar/commercial-rooftop-solar-energy-market

50 https://emp.lbl.gov/tracking-the-sun

51 https://pvwatts.nrel.gov/

SECTION 7a) Solar Panel System Acquisition and Installation

WAIRE Points from Solar Panel System Acquisition and Installation: Based on LBNL's Tracking the Sun study[52] the price per kW for a rooftop solar panel system was $2.60 per kW and a carport solar panel system was estimated to cost $3.74[53]. Carport solar panel systems have higher costs due to structural costs to elevate the solar panels to provide the carport or truck shade structure. WAIRE Points are calculated based on the total cost of the installation of the 100 kW solar panel system. Applying the $2.60 per Watt costs for rooftop installation for the 100 kW solar panel system results in a total acquisition and installation cost of $260,000. For carport solar panel system installation, the $3.74 per Watt for carport solar panel system installation for the 100 kW solar panel system which results in a total acquisition and installation cost of $374,000. Using a similar methodology as is described for installing chargers for vehicles in this document, acquisition and installation of a rooftop solar panel system could earn 15 WAIRE Points for a 100 kW rooftop solar panel system, and 19 WAIRE Points for a 100 kW carport solar panel systems.

SECTION 7b) Solar Panel System Usage

Emissions: Using emissions data from local power plants which potentially provide power to warehouses within the South Coast AQMD jurisdiction, a peak rate NOx emission factor of 0.087 lbs/MWh was calculated[54]. The combustion of natural gas at the local power plants do not generate DPM so only NOx is considered in this analysis. The calculated NOx emission factor is used with the AUM of the estimated generation of 165,000 kWh for a 100 kW solar panel system installed on a structure in the South Coast AQMD jurisdiction. Equation 1 shows the calculated the default annual NOx emission reductions from solar panel system usage.

Equation [1]

$$Emissions = (Power\ Plant\ NOx\ Emission\ Factor\ lbs/MWh) \times (Total\ Estimated\ KWh\ generated)/1{,}000$$

52 https://eta-publications.lbl.gov/sites/default/files/tracking_the_sun_2018_briefing.pdf

53 Based on a confidential data obtained from industry source that requested non-attribution.

54 Power plant emission calculations were derived from CEMS, eGRID, and EIA data to calculate for the South Coast AQMD jurisdiction

Equation 1 NOx: $0.087 \times 165{,}000 \div 1{,}000 = 14.3$ lbs

Costs: No cost is considered for the operation of the solar panel system. After the initial installation costs, the minimal maintenance costs are negligible considering the cost saving from solar electric power generation in comparison to purchasing grid power.

WAIRE Points from Solar Panel System Usage: Following the results from Equation 1, using a solar panel system would earn 1 Point for regional emission reductions. There are no cost or local benefit WAIRE Points contributions.

SECTION 8) Installation of Air Filter Systems or Air Filters in Community Facilities

Description:

The installation of air filter systems or the installation/replacement of air filters is provided on the WAIRE Menu to provide a community benefit in reducing exposure for the communities near warehouses. Air filters have been shown to successfully remove black carbon (BC) and particulate matter (PM) which include ultrafine particles (UFP) (particles with a diameter < 0.1μm), diesel particulate matter (DPM), PM2.5 (particles with a diameter < 2.5μm), and PM10 (particles with a diameter < 10μm) of outdoor particles formed from the combustion of fossil fuels that permeate into the indoors.[55] Exposure to PM contaminants may lead to potential health hazards such as asthma, lung inflammation allergies, and other respiratory or cardiovascular problems[56]. DPM is an air toxin and classified human carcinogen which account for more than 80% of the total cancer risk from air toxics in the south coast air basin (SCAB)[57]. Air filters can be integrated to a heating, ventilation, and air conditioning (HVAC) system or standalone, where the use of high- performance panel filters (HP-PF) resulted in up to 90% removal or UFP, DPM, PM2.5, and PM10, where HP-PF used were minimum efficiency reporting value 16 (MERV 16) filters[58]. The American Society of Heating, Refrigerating, and Air-Conditioning Engineers defines MERV 16 as filters used for HVAC units that remove at least 95% of particles 0.3 microns or larger.

Commercial Availability:

Air filter systems and air filters have wide commercially available throughout California with numerous manufacturers and installers who offer a range options for system sizes and air filter types.

Operation:

55 Polidori A, Fine PM, White V, Kwon PS. Pilot study of high-performance air filtration for classroom applications. Indoor Air. 2013

56 Liu, L., Poon, R., Chen, L., Frescura, A.M., Montuschi, P., Ciabattoni, G., Wheeler, A. and Dales, R. (2009) Acute Effects of Air Pollution on Pulmonary Function, Airway Inflammation, and Oxidative Stress in Asthmatic Children, Environ. Health Perspect., 117, 668–674.

57 MATES III Study; South Coast Air Quality Management District, 2008

58 Polidori A, Fine PM, White V, Kwon PS. Pilot study of high-performance air filtration for classroom applications. Indoor Air. 2013

Air filters can be installed on existing HVAC units or as standalone units at residences, schools, daycares, hospitals, community centers, and other community locations. The integration of air filters with HVAC units does lead to a decrease in the HVAC pressure as caused by the increased resistance of the filters that captures particles. In time the air filter media becomes saturated with particles leading to further HVAC pressure decreases and decreased particle capture efficiency. For standalone systems that uses its own fan the energy demand to operate at top speed is 100 watts/hr or about 5 kWh for 10 hours of operation for a 5 day week[59]. General service maintenance on the air filters involves replacement, on a set interval period or depending on the activity at the location the filters are installed.

WAIRE Points from Air Filter or Air Filter System Installation:

With the emission reductions from the installation of air filter systems or the replacement of air filters being much less than the emission reductions associated with truck purchase, the regional WAIRE Points are related the cost effort considering the same cost effectiveness. The annual metric for the number of air filter systems with MERV 16 air filters installed is 25 systems, and the annual metric for the replacement of air filters is 200 MERV 16 air filters. With the annual metrics and the estimated emission reduction, the installation of 25 air filter systems with MERV 16 air filters equates to 55 WAIRE Points, and the installation/replacement of 200 MERV 16 air filters equates to 51 WAIRE Points.

Costs: The costs for air filter systems with MERV 16 air filters were obtained from vendors and contractors that South Coast AQMD has worked with to install air filter systems and air filters at schools and other facilities as part of mitigation and settlement projects. The estimated costs analyzed for the installation of 25 air filter systems with MERV 16 air filters is $65,000 and cost for the replacement/installation of 200 MERV 16 air filters is $60,000. Using the $0.21 $/kWh electricity rate that is used in other WAIRE Menu actions and assuming 10 hours of use each day for 365 days, the estimated electricity costs for a standalone air filter system for 365 kWh would be $76.65.

59 Energy draw is based on a vendor estimate for a school installation (Email dated October 11, 2019 to Victor Juan)

Michael Hendrix Consulting

ATTACHMENT B

SUNSET CROSSROARD SUPPLEMENTAL AIR QUALITY ASSESSMENT

MEMORANDUM

URBAN | CROSSROADS

DATE: May 15, 2024
TO: JJ Jenkins, NP Banning Industrial, LLC
FROM: Haseeb Qureshi
JOB NO: 13534-05 AQ Assessment

SUNSET CROSSROADS SUPPLEMENTAL AIR QUALITY ASSESSMENT

JJ Jenkins,

Urban Crossroads, Inc. is pleased to provide the following supplemental Air Quality Assessment in support of the Sunset Crossroads (**Project**).

PROJECT OVERVIEW

A Draft Environmental Impact Report (DEIR) for the Project was released for public review on December 15, 2023. The city has received comments on the DEIR from the South Coast Air Quality Management District (SCAQMD), dated January 30, 2024 and from the California Air Resources Board (CARB), dated January 30, 2024.

The purpose of this supplemental assessment is to address the following two specific comments made by both SCAQMD and CARB:

1. The truck trip lengths are potentially understated as the modeling appears to suggest that 59% of the truck traffic would travel 40 miles and 41% of the truck traffic would travel a distance of 6.9 miles.
2. Since the Project would include the potential for high cube cold storage uses, that emissions from Transport Refrigeration Units (TRUs) need to be analyzed.

The FEIR and associated appendices contain a response to all the additional comments from SCAQMD and CARB.

REVIEW OF DEIR

Urban Crossroads, Inc. has reviewed the DEIR and underlying technical Appendix C-1 *Air Quality Impact Analysis* prepared by LSA Associates, dated October 2023. Additionally, Urban Crossroads, Inc. was provided with the electronic modeling files utilized in the DEIR to calculate air quality emissions.

Based on a review of the DEIR and underlying technical Appendix C-1, it appears that the DEIR does in fact utilize a 40-mile trip length for 59% of the trucks and a 6.9-mile trip length for 41% of the trucks. However, the DEIR based this assumption on the fact that the large Class 8 or Heavy-Duty Trucks represent 59% of the total

truck traffic[1] to the Project site and that approximately 41% of the truck traffic[2] associated with the Project would be smaller trucks and have a trip length consistent with the CalEEMod defaults.

A review of the DEIR confirms that emissions from TRUs are not explicitly included, however it should be noted that TRU regulations require electrification of TRUs to phase over the next several years and the Project is providing plug-ins at loading docks to limit the emission from TRUs. As such, TRU emissions, even if they were included, are not expected to generate a significant amount of emissions that would change the findings and conclusions of the DEIR. Notwithstanding, pursuant to the request from SCAQMD and CARB, TRUs have been calculated as a conservative measure assuming only 25 horsepower (hp) TRUs would be utilized and that they would each operate up to 4 hours on-site as discussed later in this memorandum.

SUPPLEMENTAL AIR QUALITY ASSESSMENT

Notwithstanding the technical adequacy of the DEIR and underlying Appendix C-1, this assessment serves to provide additional technical analysis to fully respond to SCAQMD and CARBs concerns. Urban Crossroads, Inc. utilized the CalEEMod input file that was included as part of the DEIR as a basis for the supplemental assessment.

UPDATED CALEEMOD ASSESSMENT

An updated CalEEMod run has been prepared in order to address both the SCAQMD and CARB comments related to the trip length.

First, the trip length for trucks by axle type has been determined based on SCAQMD's published data from their Warehouse Actions and Investments to Reduce Emissions (WAIRE) Implementation Guidelines[3].

Based on the WAIRE Implementation Guidelines (see Table 4, Page 8), average truck trip lengths are separated into three categories: Class 2b-3 (2-axle), Class 4-7 (3-axle), and Class 8 (4+-axle), as summarized on Table 1 below.

TABLE 1: AVERAGE TRUCK TRIP LENGTH FROM SCAQMD WAIRE IMPLEMTNATION GUIDE

Truck Class	Average Trip Length (Miles)
Class 2b-3 or 2-axle	15.3
Class 4-7 or 3-axle	14.2
Class 8 or 4+ axle	39.9

[1]LSA. 2023. Draft Environmental Impact Report - Sunset Crossroads: SCH NO. 2021020011. Appendix B: Proposed Project Trip Generation to Appendix J-3: Sunset Crossroads Supplemental Traffic Assessment. December.

[2] Ibid.

[3] South Coast Air Quality Management District (SCAQMD). 2021. Rule 2305 Warehouse Indirect Source Rule. June. Website: www.aqmd.gov/docs/default-source/planning/fbmsm-docs/waire-implementation-guidelines.pdf (accessed April 2024). An attachment of the WAIRE Implementation Guidelines is appended to this assessment as Attachment "A".

The next step for updating the assessment was to determine a weighted average trip length based on the number of 2, 3, and 4+ axle trucks consistent with the traffic assessment for each of the industrial land use categories modeled in CalEEMod.

More specifically, the CalEEMod runs from the DEIR includes three primary land use categories input in CalEEMod for the industrial uses that generate truck trips, as follows:

1. "Unrefrigerated Warehouse" which includes truck trips from the High-Cube Fulfillment, Warehousing, High-Cube Transload, and High Cube Parcel Hub land uses evaluated in the traffic assessment.
2. "Refrigerated Warehouse" which includes truck trips from the High-Cube Cold Storage use evaluated in the traffic assessment.
3. "General Heavy Industry" which includes truck trips from the General Heavy Industrial and General Light Industrial land use categories evaluated in the traffic assessment.

A summary of 2-, 3-, and 4+-axle trucks by modeled land use along with the calculated weighted trip length are summarized on Table 2. The resulting weighted trip length was input in CalEEMod under the Non Res C-W category, with 100% of the trips assigned to the C-W category. Table 3 provides a summary of the updated Heavy-Duty Mobile Emissions resulting from the updated trip lengths assigned to the land uses compared to the Heavy-Duty Mobile emissions as disclosed in the DEIR. As shown on Table 3, the incremental emissions that could occur based on the alternative calculation method recommended by SCAQMD and CARB would not result in a substantive increase in emissions that would cause a new significant impact that was not previously disclosed in the DEIR. The updated CalEEMod emissions outputs are summarized in Attachment B.

TABLE 2: TRUCK TRIPS BY AXLE TYPE AND WEIGHTED TRIP LENGTH

Land Use	2-axle trucks (15.3 miles)	3-axle trucks (14.2 miles)	4+ axle trucks (39.9 miles)	Total Trucks	Weighted Trip Length (miles)
Unrefrigerated Warehouse	231	253	1,348	1,832	33.25
Refrigerated Warehouse	86	28	134	248	28.47
General Heavy Industry	16	18	52	86	29.94

TABLE 3: SUMMARY OF UPDATED HEAVY-DUTY MOBILE EMISSIONS

Source	Emissions (lbs/day)					
	VOC	NO_X	CO	SO_X	PM_{10}	$PM_{2.5}$
Updated Heavy-Duty Mobile Emissions	8	352	114	2	74	23
Heavy-Duty Mobile Emissions from DEIR	7	299	102	1	60	19
Net Change	+1	+53	+12	+1	+14	+4

TRANSPORT REFRIGERATION UNITS

Both SCAQMD and CARB comment that TRU emissions should be included in the DEIR. As summarized in the *Supplemental Memorandum Regarding Air Quality Operational Emissions Estimates and Operational Health Risk Assessment With Transport Refrigeration Unit Emissions for the Proposed Sunset Crossroads Specific Plan* prepared by LSA (April 10, 2024), TRU emissions have conservatively been calculated assuming all trucks accessing Buildings 5 and 6 (the buildings proposed as cold storage warehouse use) would include only 25 hp TRUs and could operate for up to 4 hours per day on-site – which significantly overstates the emissions since the Project will provide TRU plug-ins at the loading docks. This is a conservative assumption since the current CARB regulations require an increasing percentage of all TRU fleets within the State to transition to electric only, with a full phase out of diesel TRUs by 2030. A summary of the TRU emissions is summarized on Table 4. As shown on Table 4, even with the conservative assumptions for TRUs associated with the Project, the incremental emissions would be minimal. The TRU emissions and calculations from the LSA memorandum are included in Attachment C.

TABLE 4: TRU EMISSIONS

Source	Emissions (lbs/day)					
	VOC	NO_X	CO	SO_X	PM_{10}	$PM_{2.5}$
Truck TRU Sources	13	15	2	<1	<1	<1

SUMMARY OF EMISSIONS WITH TRIP LENGTH AND TRU EMISSIONS UPDATES

Based on the SCAQMD and CARB recommended updated truck trip lengths and inclusion of TRU emissions, the emissions totals for the Project were updated based on the updated CalEEMod run for truck trip lengths and the updated LSA calculations for TRU emissions as described in this memorandum. Results of the updated emissions for the Project are summarized in Tables 5 and 6. The values that changed from the DEIR are underlined to facilitate ease of review. As shown, no new significant impacts would occur with the changes to the trip length and inclusion of TRU emissions.

TABLE 5: UPDATED REGIONAL COMBINED CONSTRUCTION AND OPERATIONAL EMISSIONS - OPENING YEAR OF PHASE 4 (2027-BUILDOUT) WITH PROJECT DESIGN FEATURES

Source	Emissions (lbs/day)					
	VOC	NO_X	CO	SO_X	PM_{10}	$PM_{2.5}$
Area Sources	130	<1	<1	<1	<1	<1
Energy Sources	2	15	13	<1	1	1
Light-Duty Mobile Sources	33	37	409	1	145	39
Heavy Duty Mobile Sources	8	352	114	2	74	23
Truck TRU Sources	13	15	2	<1	<1	<1
Warehouse Equipment	6	81	413	<1	3	3
Total Operational Emissions	**191**	**500**	**951**	**3**	**223**	**66**
2027 Construction Emissions	334	7	48	<1	9	4
Total Project Emissions	**525**	**507**	**999**	**3**	**232**	**70**
SCAQMD Threshold	**55**	**55**	**550**	**150**	**150**	**55**
Exceeds Threshold	**YES**	**YES**	**YES**	**NO**	**YES**	**YES**
New Significant Impact?	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**

TABLE 6: UPDATED REGIONAL MITIGATED OPERATIONAL EMISSIONS

Source	Emissions (lbs/day)					
	VOC	NO_X	CO	SO_X	PM_{10}	$PM_{2.5}$
Completed Development Project	186	418	537	3	220	63
SCAQMD Threshold	**55**	**55**	**550**	**150**	**150**	**55**
Exceeds Threshold	**YES**	**YES**	**NO**	**NO**	**YES**	**YES**
New Significant Impact?	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**

ATTACHMENT A
SCAQMD WAIRE IMPLEMENTATION GUIDE

ATTACHMENT A
UPDATED CALEEMOD OUTPUTS

ATTACHMENT C
LSA MEMORANDUM FOR TRU EMISSIONS

Michael Hendrix Consulting

ATTACHMENT C

SUPPLEMENTAL MEMORANDUM REGARDING OPERATIONAL EMISSIONS FROM TRANSPORT REFRIGERATION UNITS (TRUS) AND UPDATED HEALTH RISK ASSESSMENT FOR THE PROPOSED SUNSET CROSSROADS SPECIFIC PLAN PROJECT

CARLSBAD
CLOVIS
IRVINE
LOS ANGELES
PALM SPRINGS
POINT RICHMOND
RIVERSIDE
ROSEVILLE
SAN LUIS OBISPO

MEMORANDUM

DATE: May 14, 2024

TO: Sunset Crossroads Team

FROM: Ronald Brugger, Senior Air Quality Specialist
Jessica Coria, Associate

SUBJECT: Supplemental Memorandum Regarding Operational Emissions from Transport Refrigeration Units (TRUs) and updated Health Risk Assessment for the Proposed Sunset Crossroads Specific Plan Project

INTRODUCTION

The proposed Sunset Crossroads Specific Plan (project) is a proposed commercial and industrial development of a 533.8-acre property located in the City of Banning and partially in the City's Sphere of Influence in unincorporated Riverside County, as further described in the Project Description included in the Draft Environmental Impact Report (DEIR) published in December 2023 (State Clearinghouse Number (SCH No.) 2021020011). In response to comments received from the South Coast Air Quality Management (SCAQMD) and California Air Resources Board (CARB) on the October 2023 *Air Quality Impact Analysis Sunset Crossroads Specific Plan* report and the associated Section 4.3 Air Quality of the DEIR, the air quality impact analysis for the proposed project has been revised to include two updates:

- Emission estimates from potential transport refrigeration unit (TRU) use; and
- A revised Operational-Period Health Risk Assessment (HRA) to account for the additional TRU emissions and for changes in the Project Description that occurred after the HRA was completed.

Consistent with the methodology described in the DEIR, the TRU emissions estimates and HRA results were included and compared with the thresholds of significance established by the SCAQMD and the City of Banning. The results of the updated analysis are described below.

ANALYSIS RESULTS

Transport Refrigeration Units (TRU) Emissions Estimates

As specified in the project plans, only Buildings 5 and 6 could potentially be cold-storage facilities. If so configured, they would both begin operating in Phase 2. As it is not known what percentage of the trucks servicing these two buildings would have TRUs, it was conservatively assumed that trucks of all sizes servicing these two buildings would have diesel-powered TRUs. As an additional conservative assumption, the TRUs were modeled to be operational for up to 4 hours per day on-

site. This assumption is consistent with recent health analyses modeling conducted by CARB.[1] Four hours per truck visit is a conservative estimation of operational time for TRUs, as the truck operators will have access to plug-in power to operate the TRUs and will be incentivized to switch the TRU operations from diesel to electricity based on their own fuel costs and project site operational guidelines. TRUs operating at the proposed project site were assumed to be 25 bhp in size. This is yet another conservative assumption, as the CARB OFFROAD emissions model[2] used for TRU emissions factors only lists 25 and 50 hp TRUs, with 25 hp TRUs PM_{10} emission rates being higher than the 50 hp TRU PM_{10} rates.

This analysis ignores regulations that will gradually force the elimination of diesel-powered TRUs. The CARB TRU ATCM would require that increasing percentages of the Statewide TRU fleet be transitioned to all-electric, with requirements beginning in 2024 and full-phase out of diesel TRUs required by 2030. TRU emissions will continue to decrease into the future due to upcoming regulatory requirements and technological advances.

Updated TRU Emissions Estimates

Based on the methodology described above, TRU emissions have been calculated for the Project. Table A summarizes the criteria pollutant emissions associated with TRUs as described above. The TRU emissions calculations are included as Attachment A.

Table A: Regional Truck TRU Operational Emissions

Source	Pollutant Emissions (lbs/day)					
	VOCs	NO_X	CO	SO_X	PM_{10}	$PM_{2.5}$
Truck TRU Sources	13	15	2	<1	<1	<1

Source: Compiled by LSA Associates, Inc. (March 2024).
CO = carbon monoxide
lbs/day = pounds per day
NO_x = nitrogen oxides
$PM_{2.5}$ = particulate matter less than 2.5 microns in size
PM_{10} = particulate matter less than 10 microns in size
SO_x = sulfur oxides
VOCs = volatile organic compounds

Operational Health Risk Assessment Update

The analysis conducted for the March 2023 *Health Risk Assessment Sunset Crossroads Specific Plan* (HRA) document and DEIR was updated to incorporate the operational-period TRU emission estimates, as described above; to add a line-volume source to represent the dispersion of emissions that would occur from vehicles exiting Interstate 10 (I-10) to Sunset Avenue and Highland Springs Avenue; and to match the revised project plans that would relocate the portion of Sunset Avenue between Westward Avenue and Lincoln Street, 42 feet to the west.

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1 California Air Resources Board (CARB). 2021. Proposed Amendments to the Airborne Toxic Control Measure for In-Use Diesel-Fueled Transport Refrigeration Units (TRU) and TRU Generator Sets, and Facilities Where TRUs Operate – Appendix I, Health Analyses: Transport Refrigeration Units. July.

2 California Air Resources Board (CARB). Off-Road Emissions Inventory. Website: arb.ca.gov/emfac/offroad/emissions-inventory (accessed April 2024).

Table 4.3.Q from the DEIR is shown below with changes shown from the updated HRA analysis in underline-strikeout format. The supporting technical documentation from the updated HRA is included as Attachment B. As with the original HRA, the health risk estimated in this updated HRA analysis are conservative as they assume a 30-year residential exposure duration and 25-year worker exposure duration to the emissions level estimated to occur when the project is fully built-out and operational in 2027. However, emissions associated with trucking and TRUs would decrease from these estimates into the future due to technological advancements and regulatory requirements, including the CARB TRU ATCM and Advanced Clean Fleets Regulation, as further discussed in Section 4.3 of the DEIR. Thus, the actual 30-year and 25-year exposure would be lower than presented due to future decreases in emission rates from these regulations.

Revised Table 4.3.Q: Health Risk Levels for Nearby Residents and Students

Location	Maximum Cancer Risk	Maximum Noncancer Chronic Risk (Hazard Index)	Maximum Noncancer Acute Risk (Hazard Index)
Residential & Student MEI Risks	~~3.3~~3.8 in 1 million	0.00~~08~~10	0.000~~5~~3
Worker MEI Risks	~~0.02~~0.25 in 1 million	0.000~~1~~8	0.000~~1~~3
SCAQMD Significance Threshold	**10 in 1 million**	**1.0**	**1.0**
Significant?	**No**	**No**	**No**

Source: Compiled by LSA Associates, Inc. (March 2024).
MEI = maximum exposed individual
SCAQMD = South Coast Air Quality Management District

As shown in Revised Table 4.3.Q, the additional emissions from TRUs on all trucks servicing the cold-storage for Buildings 5 and 6, the additional emissions from vehicles exiting I-10 to Sunset Avenue and Highland Springs Avenue, and the relocation of the portion of Sunset Avenue between Westward Avenue and Lincoln Street, 42 feet to the west, would increase the overall cancer risk to the Residential and Student Maximum Exposed Individual (MEI) from 3.3 in one million to 3.8 in one million. For the Worker MEI, the potential cancer risk would increase from 0.02 in one million to 0.25 in one million. Revised Table 4.3.Q also shows the changes to the chronic and acute health risk levels. These results indicate that the additional emissions and project updates would not result in any new significant health risk impacts from those described in the DEIR.

Attachment A: OFFROAD TRU Emissions Factors

Attachment B: Health Risk Assessment Updated Worksheets

ATTACHMENT A

OFFROAD TRU EMISSIONS FACTORS

TRU Emissions Worksheet

Table __: Operational TRU Emissions

Category	Pollutant Emissions, lbs/day					
	ROG	**NO_X**	**CO**	**SO_X**	**PM_{10}**	**$PM_{2.5}$**
Truck TRU Sources	13	15	1.7	0.02	0.4	0.3

Truck/TRU ADT

Source	2-axle	3-axle	4+-axle
Building 5	26	32	96
Building 6	10	12	38

Assume each TRU operates for 4 hours per truck trip

Operational Year: 2027

OFFROAD2021 TRU Emissions

Model Output: OFFROAD2021 (v1.0.5) Emissions Inventory
Region Type: Sub-Area
Region: Riverside (SC)
Calendar Year: 2027
Scenario: All Adopted Rules - Exhaust
Vehicle Classification: OFFROAD2021 Equipment Types
Units: tons/day for Emissions

														Emissions (gm/hr)						
Region	Calend	Vehicle Category	Model Yea	Horsepow	Fuel	ROG_tpd	CO_tpd	NOx_tpd	CO2_tpd	PM10_tpd	PM2.5_tpd	SOx_tpd	NH3_tpd	tal_Populat	VOC	NOx	CO	SO2	PM10	PM2.5	CO2
Riverside (S	2027	Transport Refrigeration Unit - Instate Trailer	Aggregate	25	Diesel	0.1530	0.0202	0.1688	29.43	0.0043	0.0040	0.0003	6.6E-07	826	7.01	7.73	0.93	0.013	0.20	0.18	1,348
Riverside (S	2027	Transport Refrigeration Unit - Instate Trailer	Aggregate	50	Diesel	0.2257	0.0290	0.1951	44.11	0.0026	0.0024	0.0004	9.89E-07	1,087	7.85	6.78	1.01	0.015	0.09	0.08	1,534

ATTACHMENT B

HEALTH RISK ASSESSMENT UPDATED WORKSHEETS

Sunset Crossroads

Land Uses	Units TSF	ADT Cars	2-Axle	3-Axle	4+-Axle
Building 1	1,420	2,486	58	58	423
Building 2	1,386	2,426	57	57	415
Building 3	575	1,006	24	24	173
Building 4	44	202	4	4	12
Building 5	326	256	51	24	99
Building 6	152	310	47	18	79
Building 7	896	832	34	42	126
Building 8	250	948	18	22	66
Building 9	274	348	22	28	82
Building 10	222	650	18	22	62
Commercial/Retail (see below)	268.4	4,239	2,095	295	117
Gas Station [1]		956	58	188	918
Total		14,659	2,485	780	2,572

Note [1] Gas station trips based on the number of pumps, 20 gas fueling positions and 6 diesel fueling positions.
ADT = Average Daily Trips
TSF = Thousand Square Feet

Fleet Mix data from the LD Vehicle CalEEMod run

Land Use	Amount	Trip rate	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Fast Food Restaurant with Drive Thru	7	176.571	0.547196	0.056762	0.174118	0.130529	0.024505	0.006824	0.012367	0.017399	0.000546	0.000242	0.024357	0.000961	0.004193
Health Club	116.7	24.13	0.547196	0.056762	0.174118	0.130529	0.024505	0.006824	0.012367	0.017399	0.000546	0.000242	0.024357	0.000961	0.004193
High Turnover (Sit Down Restaurant)	40	29.9	0.547196	0.056762	0.174118	0.130529	0.024505	0.006824	0.012367	0.017399	0.000546	0.000242	0.024357	0.000961	0.004193
Hotel	125	3.008	0.547196	0.056762	0.174118	0.130529	0.024505	0.006824	0.012367	0.017399	0.000546	0.000242	0.024357	0.000961	0.004193
Medical Office Building	9.5	22.526	0.547196	0.056762	0.174118	0.130529	0.024505	0.006824	0.012367	0.017399	0.000546	0.000242	0.024357	0.000961	0.004193
Quality Restaurant	9.5	18.737	0.547196	0.056762	0.174118	0.130529	0.024505	0.006824	0.012367	0.017399	0.000546	0.000242	0.024357	0.000961	0.004193
Regional Shopping Center	78.2	9.335	0.547196	0.056762	0.174118	0.130529	0.024505	0.006824	0.012367	0.017399	0.000546	0.000242	0.024357	0.000961	0.004193

Summarizing above into 4 vehicle categories

Land Use	Cars	2-axle	3-axle	4+-axle	
Fast Food Restaurant with Drive Thru	777	384	54	22	
Health Club	1,769	875	123	49	
High Turnover (Sit Down Restaurant)	751	371	52	21	
Hotel	236	117	16	7	
Medical Office Building	134	66	9	4	
Quality Restaurant	112	55	8	3	
Regional Shopping Center	459	227	32	13	
Totals	4,239	2,095	295	117	6,746

Idling Truck Exhaust Worksheet

Sunset Crossroads

Facility	Hour per day	Deliveries per day[1]	Trips per Hour	Diesel Idle Exhaust PM_{10} (gm/vh-hr)[2]	Diesel TRU Exhaust PM_{10} (gm/vh-hr)[3]	Diesel Idle Exhaust $PM_{2.5}$ (gm/vh-hr)[2]	Diesel TRU Exhaust $PM_{2.5}$ (gm/vh-hr)[3]	Idle Time (min/trip)[4]	TRU Run Time (min/trip)[5]	Total Diesel Exhaust PM_{10} (gm/hr)	Total Diesel Exhaust $PM_{2.5}$ (gm/hr)
Building 1	24	481	20.0	0.0122	N/A	0.0116	N/A	15	N/A	0.0609	0.0582
Building 2	24	472	19.6	0.0122	N/A	0.0116	N/A	15	N/A	0.0597	0.0571
Building 3	24	197	8.2	0.0122	N/A	0.0116	N/A	15	N/A	0.0249	0.0238
Building 4	24	16	0.7	0.0122	N/A	0.0116	N/A	15	N/A	0.0020	0.0019
Building 5	24	123	5.1	0.0122	0.1970	0.0116	0.1814	15	240	4.0540	3.7327
Building 6	24	97	4.0	0.0122	0.1970	0.0116	0.1814	15	240	3.1971	2.9437
Building 7	24	168	7.0	0.0122	N/A	0.0116	N/A	15	N/A	0.0213	0.0204
Building 8	24	88	3.7	0.0122	N/A	0.0116	N/A	15	N/A	0.0111	0.0107
Building 9	24	110	4.6	0.0122	N/A	0.0116	N/A	15	N/A	0.0139	0.0133
Building 10	24	84	3.5	0.0122	N/A	0.0116	N/A	15	N/A	0.0106	0.0102

Number of Sources	Diesel PM10 lb/hr	Diesel PM10 lb/yr	Diesel PM2.5 lb/hr	Diesel PM2.5 lb/yr
36	3.7E-06	0.0327	3.6E-06	0.0313
36	3.7E-06	0.0321	3.5E-06	0.0307
14	3.9E-06	0.0344	3.7E-06	0.0329
0	0.0E+00	0.0000	0.0E+00	0.0000
7	1.3E-03	11.1924	1.2E-03	10.3055
3	2.3E-03	20.5953	2.2E-03	18.9632
22	2.1E-06	0.0187	2.0E-06	0.0179
6	4.1E-06	0.0359	3.9E-06	0.0343
5	6.1E-06	0.0539	5.9E-06	0.0515
4	5.9E-06	0.0514	5.6E-06	0.0492

Note: Buildings 5 & 6 are the only two that would be cold storage, thus the only two that would have trucks with TRUs.

[1] Deliveries per day are the combination of 3-axle and 4+-axle trucks from project traffic study. Note that each truck visit comprises two trips, one to arrive and one to leave.

[2] Source: EMFAC2021 2027 idling emission factors for HHDT diesel trucks.

[3] Source: OFFROAD2021 2027 operating emissions factors for Transport Refrigeration Unit - Instate Trailer.

[4] It is assumed that each truck idles for 15 minute per trip to account for multiple stops, i.e. at an entry check-in, loading/unloading and miscellaneous tasks.

[5] It is assumed that each TRU operates for 4 hours per truck visit to warehouse.

Vehicle Exhaust Worksheet

Sunset Crossroads

Travel Along Building 1		AADT by Truck Category[1]			
		LDV[2]	**2-Axle[3]**	**3-Axle[4]**	**4+-Axle[5]**
		2,486	58	58	423
		% of Vehicles That Are Diesel-Powered[6]			
Average Speed		0.2%	1%	89%	93%
		Diesel Exhaust PM10 & PM2.5 Emissions at 5 mph (g/mi)7			
5 mph	PM_{10}	0.0363	2.37E-02	2.37E-02	1.21E-02
	$PM_{2.5}$	0.0348	2.27E-02	2.26E-02	1.16E-02
		% of Vehicles That Are Gasoline-Powered[6]			
		100%	99%	11%	6.7%
		Gasoline Exhaust ROG Emissions at 5 mph (g/mi)7			
	ROG	0.044	0.088	0.211	4.075

Total distance covered by vehicles traveling along Building 1
1,749 meters

		Number of Sources	**Emission Rates per source**		
			g/s	**lb/hr**	**lb/yr**
	PM_{10}, $PM_{2.5}$ & ROG Exhaust Emissions (g/s)				
PM_{10}	2.58E-06	2.46E-07	1.52E-05	6.03E-05	186	4.2E-07	3.3E-06	0.0293
$PM_{2.5}$	2.46E-06	2.35E-07	1.45E-05	5.77E-05	186	4.0E-07	3.2E-06	0.0280
ROG	1.37E-03	6.28E-05	1.72E-05	1.46E-03	186	1.6E-05	1.2E-04	1.0880

Speciated Emissions Rates

		lb/yr	lb/hr
diesel part.	--	2.93E-02	3.34E-06
PM2.5	--	2.80E-02	3.20E-06
1,3-butadiene	0.0055	5.98E-03	6.83E-07
benzene	0.02636	2.87E-02	3.27E-06
ethylbenzene	0.01072	1.17E-02	1.33E-06
MEK	0.00019	2.07E-04	2.36E-08
naphthalene	0.00048	5.22E-04	5.96E-08
propylene	0.03127998	3.40E-02	3.88E-06
styrene	0.00126	1.37E-03	1.56E-07
toluene	0.05879998	6.40E-02	7.30E-06
m & p-xylene	0.03639998	3.96E-02	4.52E-06

[1] AADT from project traffic study

[2] LDV assumed to LDA (Passenger Cars)

[3] 2 axle trucks are assumed to be MDV (Medium-Duty Truck GVW=5,574-8,500 lbs.)

[4] 3 axle trucks are assumed to be MHDT (Medium-Heavy Duty Truck GVW=14,001-33,000 lbs.)

[5] 4+ axle trucks are assumed to be HHDT (Heavy-Heavy Duty Truck GVW=33,001-60,000 lbs.)

[6] Source: EMFAC2021 VMT data

[7] Source: EMFAC2021 emission factors for 2027 (model year aggregate).

Vehicle Exhaust Worksheet

Sunset Crossroads

Travel Along Building 2		AADT by Truck Category[1]			
		LDV[2]	**2-Axle[3]**	**3-Axle[4]**	**4+-Axle[5]**
		2,426	57	57	415
		% of Vehicles That Are Diesel-Powered[6]			
Average Speed		0.2%	1%	89%	93%
		Diesel Exhaust PM10 & PM2.5 Emissions at 5 mph (g/mi)7			
5 mph	PM_{10}	0.0363	2.37E-02	2.37E-02	1.21E-02
	$PM_{2.5}$	0.0348	2.27E-02	2.26E-02	1.16E-02
		% of Vehicles That Are Gasoline-Powered[6]			
		100%	99%	11%	6.7%
		Gasoline Exhaust ROG Emissions at 5 mph (g/mi)7			
	ROG	0.044	0.088	0.211	4.075

Total distance covered by vehicles traveling along Building 2
1,715 meters

		Number of Sources	**Emission Rates per source**		
			g/s	**lb/hr**	**lb/yr**
	PM_{10}, $PM_{2.5}$ & ROG Exhaust Emissions (g/s)				
PM_{10}	2.46E-06	181	4.2E-07	3.3E-06	0.0289
$PM_{2.5}$	2.36E-06	181	4.0E-07	3.2E-06	0.0277
ROG	1.31E-03	181	1.5E-05	1.2E-04	1.0726

Speciated Emissions Rates

		lb/yr	lb/hr
diesel part.	--	2.89E-02	3.30E-06
PM2.5	--	2.77E-02	3.16E-06
1,3-butadiene	0.0055	5.90E-03	6.73E-07
benzene	0.02636	2.83E-02	3.23E-06
ethylbenzene	0.01072	1.15E-02	1.31E-06
MEK	0.00019	2.04E-04	2.32E-08
naphthalene	0.00048	5.15E-04	5.87E-08
propylene	0.03127998	3.36E-02	3.83E-06
styrene	0.00126	1.35E-03	1.54E-07
toluene	0.05879998	6.31E-02	7.19E-06
m & p-xylene	0.03639998	3.90E-02	4.45E-06

[1] AADT from project traffic study

[2] LDV assumed to LDA (Passenger Cars)

[3] 2 axle trucks are assumed to be MDV (Medium-Duty Truck GVW=5,574-8,500 lbs.)

[4] 3 axle trucks are assumed to be MHDT (Medium-Heavy Duty Truck GVW=14,001-33,000 lbs.)

[5] 4+ axle trucks are assumed to be HHDT (Heavy-Heavy Duty Truck GVW=33,001-60,000 lbs.)

[6] Source: EMFAC2021 VMT data

[7] Source: EMFAC2021 emission factors for 2027 (model year aggregate).

Vehicle Exhaust Worksheet

Sunset Crossroads

Travel Along Building 3		AADT by Truck Category[1]			
		LDV[2]	**2-Axle[3]**	**3-Axle[4]**	**4+-Axle[5]**
		1,006	24	24	173
		% of Vehicles That Are Diesel-Powered[6]			
Average Speed		0.2%	1%	89%	93%
		Diesel Exhaust PM10 & PM2.5 Emissions at 5 mph (g/mi)7			
5 mph	PM_{10}	0.0363	2.37E-02	2.37E-02	1.21E-02
	$PM_{2.5}$	0.0348	2.27E-02	2.26E-02	1.16E-02
		% of Vehicles That Are Gasoline-Powered[6]			
		100%	99%	11%	6.7%
		Gasoline Exhaust ROG Emissions at 5 mph (g/mi)7			
	ROG	0.044	0.088	0.211	4.075
		PM_{10}, $PM_{2.5}$ & ROG Exhaust Emissions (g/s)			
	PM_{10}	4.57E-07	4.41E-08	2.72E-06	1.08E-05
	$PM_{2.5}$	4.37E-07	4.22E-08	2.61E-06	1.03E-05
	ROG	2.43E-04	1.13E-05	3.07E-06	2.62E-04

Total distance covered by vehicles traveling along Building 3
767 meters

Number of Sources	**Emission Rates per source**		
	g/s	**lb/hr**	**lb/yr**
83	1.7E-07	1.3E-06	0.0118
83	1.6E-07	1.3E-06	0.0113
83	6.3E-06	5.0E-05	0.4351

[1] AADT from project traffic study

[2] LDV assumed to LDA (Passenger Cars)

[3] 2 axle trucks are assumed to be MDV (Medium-Duty Truck GVW=5,574-8,500 lbs.)

[4] 3 axle trucks are assumed to be MHDT (Medium-Heavy Duty Truck GVW=14,001-33,000 lbs.)

[5] 4+ axle trucks are assumed to be HHDT (Heavy-Heavy Duty Truck GVW=33,001-60,000 lbs.)

[6] Source: EMFAC2021 VMT data

[7] Source: EMFAC2021 emission factors for 2027 (model year aggregate).

Speciated Emissions Rates

		lb/yr	lb/hr
diesel part.	--	1.18E-02	1.34E-06
PM2.5	--	1.13E-02	1.28E-06
1,3-butadiene	0.0055	2.39E-03	2.73E-07
benzene	0.02636	1.15E-02	1.31E-06
ethylbenzene	0.01072	4.66E-03	5.32E-07
MEK	0.00019	8.27E-05	9.43E-09
naphthalene	0.00048	2.09E-04	2.38E-08
propylene	0.03127998	1.36E-02	1.55E-06
styrene	0.00126	5.48E-04	6.25E-08
toluene	0.05879998	2.56E-02	2.92E-06
m & p-xylene	0.03639998	1.58E-02	1.81E-06

Vehicle Exhaust Worksheet

Sunset Crossroads

Travel Along Building 4		AADT by Truck Category[1]			
		LDV[2]	**2-Axle[3]**	**3-Axle[4]**	**4+-Axle[5]**
		202	4	4	12
		% of Vehicles That Are Diesel-Powered[6]			
Average Speed		0.2%	1%	89%	93%
		Diesel Exhaust PM10 & PM2.5 Emissions at 5 mph (g/mi)7			
5 mph	PM_{10}	0.0363	2.37E-02	2.37E-02	1.21E-02
	$PM_{2.5}$	0.0348	2.27E-02	2.26E-02	1.16E-02
		% of Vehicles That Are Gasoline-Powered[6]			
		100%	99%	11%	6.7%
		Gasoline Exhaust ROG Emissions at 5 mph (g/mi)7			
	ROG	0.044	0.088	0.211	4.075
		PM_{10}, $PM_{2.5}$ & ROG Exhaust Emissions (g/s)			
	PM_{10}	8.09E-09	6.61E-10	4.09E-08	6.61E-08
	$PM_{2.5}$	7.74E-09	6.33E-10	3.91E-08	6.32E-08
	ROG	4.30E-06	1.69E-07	4.61E-08	1.60E-06

Total distance covered by vehicles traveling along Building 4
68 meters

Number of Sources	**Emission Rates per source**		
	g/s	**lb/hr**	**lb/yr**
8	1.4E-08	1.1E-07	0.0010
8	1.4E-08	1.1E-07	0.0010
8	7.6E-07	6.1E-06	0.0532

[1] AADT from project traffic study

[2] LDV assumed to LDA (Passenger Cars)

[3] 2 axle trucks are assumed to be MDV (Medium-Duty Truck GVW=5,574-8,500 lbs.)

[4] 3 axle trucks are assumed to be MHDT (Medium-Heavy Duty Truck GVW=14,001-33,000 lbs.)

[5] 4+ axle trucks are assumed to be HHDT (Heavy-Heavy Duty Truck GVW=33,001-60,000 lbs.)

[6] Source: EMFAC2021 VMT data

[7] Source: EMFAC2021 emission factors for 2027 (model year aggregate).

Speciated Emissions Rates

		lb/yr	lb/hr
diesel part.	--	1.01E-03	1.15E-07
PM2.5	--	9.63E-04	1.10E-07
1,3-butadiene	0.0055	2.93E-04	3.34E-08
benzene	0.02636	1.40E-03	1.60E-07
ethylbenzene	0.01072	5.70E-04	6.51E-08
MEK	0.00019	1.01E-05	1.15E-09
naphthalene	0.00048	2.55E-05	2.91E-09
propylene	0.03127998	1.66E-03	1.90E-07
styrene	0.00126	6.70E-05	7.65E-09
toluene	0.05879998	3.13E-03	3.57E-07
m & p-xylene	0.03639998	1.94E-03	2.21E-07

Vehicle Exhaust Worksheet

Sunset Crossroads

Travel Along Building 5		AADT by Truck Category[1]			
		LDV[2]	**2-Axle[3]**	**3-Axle[4]**	**4+-Axle[5]**
		256	51	24	99
		% of Vehicles That Are Diesel-Powered[6]			
Average Speed		0.2%	1%	89%	93%
		Diesel Exhaust PM10 & PM2.5 Emissions at 5 mph (g/mi)7			
5 mph	PM_{10}	0.0363	2.37E-02	2.37E-02	1.21E-02
	$PM_{2.5}$	0.0348	2.27E-02	2.26E-02	1.16E-02
		Diesel Exhaust PM10 & PM2.5 Emissions from TRUs (g/hr)			
	PM_{10}	N/A	1.97E-01	1.97E-01	1.97E-01
	$PM_{2.5}$	N/A	1.81E-01	1.81E-01	1.81E-01
		% of Vehicles That Are Gasoline-Powered[6]			
		100%	99%	11%	6.7%
		Gasoline Exhaust ROG Emissions at 5 mph (g/mi)7			
	ROG	0.044	0.088	0.211	4.075
		PM_{10}, $PM_{2.5}$ & ROG Exhaust Emissions (g/s)			
	PM_{10}	4.83E-08	5.48E-05	5.59E-05	5.73E-05
	$PM_{2.5}$	4.63E-08	5.04E-05	5.04E-05	5.04E-05
	ROG	2.57E-05	1.02E-05	1.30E-06	6.22E-05

Total distance covered by vehicles traveling along Building 5
319 meters

Number of Sources	**Emission Rates per source**		
	g/s	**lb/hr**	**lb/yr**
35	4.8E-06	3.8E-05	0.3339
35	4.3E-06	3.4E-05	0.3005
35	2.8E-06	2.3E-05	0.1975

[1] AADT from project traffic study

[2] LDV assumed to LDA (Passenger Cars)

[3] 2 axle trucks are assumed to be MDV (Medium-Duty Truck GVW=5,574-8,500 lbs.)

[4] 3 axle trucks are assumed to be MHDT (Medium-Heavy Duty Truck GVW=14,001-33,000 lbs.)

Speciated Emissions Rates

		lb/yr	lb/hr
diesel part.	--	3.34E-01	3.81E-05
PM2.5	--	3.01E-01	3.43E-05
1,3-butadiene	0.0055	1.09E-03	1.24E-07
benzene	0.02636	5.21E-03	5.94E-07
ethylbenzene	0.01072	2.12E-03	2.42E-07
MEK	0.00019	3.75E-05	4.28E-09
naphthalene	0.00048	9.48E-05	1.08E-08
propylene	0.03127998	6.18E-03	7.05E-07
styrene	0.00126	2.49E-04	2.84E-08
toluene	0.05879998	1.16E-02	1.32E-06
m & p-xylene	0.03639998	7.19E-03	8.20E-07

Vehicle Exhaust Worksheet

Sunset Crossroads

Travel Along Building 6		AADT by Truck Category[1]			
		LDV[2]	**2-Axle[3]**	**3-Axle[4]**	**4+-Axle[5]**
		310	47	18	79
		% of Vehicles That Are Diesel-Powered[6]			
Average Speed		0.2%	1%	89%	93%
		Diesel Exhaust PM10 & PM2.5 Emissions at 5 mph (g/mi)7			
5 mph	PM_{10}	0.0363	2.37E-02	2.37E-02	1.21E-02
	$PM_{2.5}$	0.0348	2.27E-02	2.26E-02	1.16E-02
		Diesel Exhaust PM10 & PM2.5 Emissions from TRUs (g/hr)			
	PM_{10}	N/A	1.97E-01	1.97E-01	1.97E-01
	$PM_{2.5}$	N/A	1.81E-01	1.81E-01	1.81E-01
		% of Vehicles That Are Gasoline-Powered[6]			
		100%	99%	11%	6.7%
		Gasoline Exhaust ROG Emissions at 5 mph (g/mi)7			
	ROG	0.044	0.088	0.211	4.075
		PM_{10}, $PM_{2.5}$ & ROG Exhaust Emissions (g/s)			
	PM_{10}	8.68E-08	5.48E-05	5.60E-05	5.78E-05
	$PM_{2.5}$	8.30E-08	5.04E-05	5.04E-05	5.04E-05
	ROG	4.62E-05	1.39E-05	1.45E-06	7.36E-05

Total distance covered by vehicles traveling along Building 6
473 meters

Number of Sources	**Emission Rates per source**		
	g/s	**lb/hr**	**lb/yr**
50	3.4E-06	2.7E-05	0.2346
50	3.0E-06	2.4E-05	0.2104
50	2.7E-06	2.1E-05	0.1880

[1] AADT from project traffic study

[2] LDV assumed to LDA (Passenger Cars)

[3] 2 axle trucks are assumed to be MDV (Medium-Duty Truck GVW=5,574-8,500 lbs.)

[4] 3 axle trucks are assumed to be MHDT (Medium-Heavy Duty Truck GVW=14,001-33,000 lbs.)

Speciated Emissions Rates

		lb/yr	lb/hr
diesel part.	--	2.35E-01	2.68E-05
PM2.5	--	2.10E-01	2.40E-05
1,3-butadiene	0.0055	1.03E-03	1.18E-07
benzene	0.02636	4.95E-03	5.65E-07
ethylbenzene	0.01072	2.01E-03	2.30E-07
MEK	0.00019	3.57E-05	4.07E-09
naphthalene	0.00048	9.02E-05	1.03E-08
propylene	0.03127998	5.88E-03	6.71E-07
styrene	0.00126	2.37E-04	2.70E-08
toluene	0.05879998	1.11E-02	1.26E-06
m & p-xylene	0.03639998	6.84E-03	7.80E-07

Vehicle Exhaust Worksheet

Sunset Crossroads

Travel Along Building 7		AADT by Truck Category[1]			
		LDV[2]	**2-Axle[3]**	**3-Axle[4]**	**4+-Axle[5]**
		832	34	42	126
		% of Vehicles That Are Diesel-Powered[6]			
Average Speed		0.2%	1%	89%	93%
		Diesel Exhaust PM10 & PM2.5 Emissions at 5 mph (g/mi)7			
5 mph	PM_{10}	0.0363	2.37E-02	2.37E-02	1.21E-02
	$PM_{2.5}$	0.0348	2.27E-02	2.26E-02	1.16E-02
		% of Vehicles That Are Gasoline-Powered[6]			
		100%	99%	11%	6.7%
		Gasoline Exhaust ROG Emissions at 5 mph (g/mi)7			
	ROG	0.044	0.088	0.211	4.075
		PM_{10}, $PM_{2.5}$ & ROG Exhaust Emissions (g/s)			
	PM_{10}	6.93E-07	1.17E-07	8.92E-06	1.44E-05
	$PM_{2.5}$	6.63E-07	1.12E-07	8.53E-06	1.38E-05
	ROG	3.69E-04	2.99E-05	1.01E-05	3.49E-04

Total distance covered by vehicles traveling along Building 7
1,406 meters

Number of Sources	**Emission Rates per source**		
	g/s	**lb/hr**	**lb/yr**
148	1.6E-07	1.3E-06	0.0114
148	1.6E-07	1.2E-06	0.0109
148	5.1E-06	4.1E-05	0.3562

Speciated Emissions Rates

		lb/yr	lb/hr
diesel part.	--	1.14E-02	1.30E-06
PM2.5	--	1.09E-02	1.24E-06
1,3-butadiene	0.0055	1.96E-03	2.24E-07
benzene	0.02636	9.39E-03	1.07E-06
ethylbenzene	0.01072	3.82E-03	4.36E-07
MEK	0.00019	6.77E-05	7.72E-09
naphthalene	0.00048	1.71E-04	1.95E-08
propylene	0.03127998	1.11E-02	1.27E-06
styrene	0.00126	4.49E-04	5.12E-08
toluene	0.05879998	2.09E-02	2.39E-06
m & p-xylene	0.03639998	1.30E-02	1.48E-06

[1] AADT from project traffic study

[2] LDV assumed to LDA (Passenger Cars)

[3] 2 axle trucks are assumed to be MDV (Medium-Duty Truck GVW=5,574-8,500 lbs.)

[4] 3 axle trucks are assumed to be MHDT (Medium-Heavy Duty Truck GVW=14,001-33,000 lbs.)

[5] 4+ axle trucks are assumed to be HHDT (Heavy-Heavy Duty Truck GVW=33,001-60,000 lbs.)

[6] Source: EMFAC2021 VMT data

[7] Source: EMFAC2021 emission factors for 2027 (model year aggregate).

Vehicle Exhaust Worksheet

Sunset Crossroads

Travel Along Building 8		AADT by Truck Category[1]			
		LDV[2]	**2-Axle[3]**	**3-Axle[4]**	**4+-Axle[5]**
		948	18	22	66
		% of Vehicles That Are Diesel-Powered[6]			
Average Speed		0.2%	1%	89%	93%
		Diesel Exhaust PM10 & PM2.5 Emissions at 5 mph (g/mi)7			
5 mph	PM_{10}	0.0363	2.37E-02	2.37E-02	1.21E-02
	$PM_{2.5}$	0.0348	2.27E-02	2.26E-02	1.16E-02
		% of Vehicles That Are Gasoline-Powered[6]			
		100%	99%	11%	6.7%
		Gasoline Exhaust ROG Emissions at 5 mph (g/mi)7			
	ROG	0.044	0.088	0.211	4.075
		PM_{10}, $PM_{2.5}$ & ROG Exhaust Emissions (g/s)			
	PM_{10}	3.25E-07	2.54E-08	1.92E-06	3.11E-06
	$PM_{2.5}$	3.11E-07	2.43E-08	1.84E-06	2.97E-06
	ROG	1.73E-04	6.50E-06	2.17E-06	7.52E-05

Total distance covered by vehicles traveling along Building 8
578 meters

Number of Sources	**Emission Rates per source**		
	g/s	**lb/hr**	**lb/yr**
61	8.8E-08	7.0E-07	0.0061
61	8.4E-08	6.7E-07	0.0059
61	4.2E-06	3.3E-05	0.2927

Speciated Emissions Rates

		lb/yr	lb/hr
diesel part.	--	6.14E-03	7.00E-07
PM2.5	--	5.87E-03	6.70E-07
1,3-butadiene	0.0055	1.61E-03	1.84E-07
benzene	0.02636	7.72E-03	8.80E-07
ethylbenzene	0.01072	3.14E-03	3.58E-07
MEK	0.00019	5.56E-05	6.34E-09
naphthalene	0.00048	1.40E-04	1.60E-08
propylene	0.03127998	9.16E-03	1.04E-06
styrene	0.00126	3.69E-04	4.21E-08
toluene	0.05879998	1.72E-02	1.96E-06
m & p-xylene	0.03639998	1.07E-02	1.22E-06

[1] AADT from project traffic study

[2] LDV assumed to LDA (Passenger Cars)

[3] 2 axle trucks are assumed to be MDV (Medium-Duty Truck GVW=5,574-8,500 lbs.)

[4] 3 axle trucks are assumed to be MHDT (Medium-Heavy Duty Truck GVW=14,001-33,000 lbs.)

[5] 4+ axle trucks are assumed to be HHDT (Heavy-Heavy Duty Truck GVW=33,001-60,000 lbs.)

[6] Source: EMFAC2021 VMT data

[7] Source: EMFAC2021 emission factors for 2027 (model year aggregate).

Vehicle Exhaust Worksheet

Sunset Crossroads

Travel Along Building 9		AADT by Truck Category[1]			
		LDV[2]	**2-Axle[3]**	**3-Axle[4]**	**4+-Axle[5]**
		348	22	28	82
		% of Vehicles That Are Diesel-Powered[6]			
Average Speed		0.2%	1%	89%	93%
		Diesel Exhaust PM10 & PM2.5 Emissions at 5 mph (g/mi)7			
5 mph	PM_{10}	0.0363	2.37E-02	2.37E-02	1.21E-02
	$PM_{2.5}$	0.0348	2.27E-02	2.26E-02	1.16E-02
		% of Vehicles That Are Gasoline-Powered[6]			
		100%	99%	11%	6.7%
		Gasoline Exhaust ROG Emissions at 5 mph (g/mi)7			
	ROG	0.044	0.088	0.211	4.075
		PM_{10}, $PM_{2.5}$ & ROG Exhaust Emissions (g/s)			
	PM_{10}	1.05E-07	2.74E-08	2.15E-06	3.40E-06
	$PM_{2.5}$	1.00E-07	2.62E-08	2.06E-06	3.25E-06
	ROG	5.58E-05	7.00E-06	2.43E-06	8.23E-05

Total distance covered by vehicles traveling along Building 9
509 meters

Number of Sources	**Emission Rates per source**		
	g/s	**lb/hr**	**lb/yr**
50	1.1E-07	9.0E-07	0.0079
50	1.1E-07	8.6E-07	0.0076
50	2.9E-06	2.3E-05	0.2052

[1] AADT from project traffic study

[2] LDV assumed to LDA (Passenger Cars)

[3] 2 axle trucks are assumed to be MDV (Medium-Duty Truck GVW=5,574-8,500 lbs.)

[4] 3 axle trucks are assumed to be MHDT (Medium-Heavy Duty Truck GVW=14,001-33,000 lbs.)

[5] 4+ axle trucks are assumed to be HHDT (Heavy-Heavy Duty Truck GVW=33,001-60,000 lbs.)

[6] Source: EMFAC2021 VMT data

[7] Source: EMFAC2021 emission factors for 2027 (model year aggregate).

Speciated Emissions Rates

		lb/yr	lb/hr
diesel part.	--	7.91E-03	9.02E-07
PM2.5	--	7.57E-03	8.63E-07
1,3-butadiene	0.0055	1.13E-03	1.29E-07
benzene	0.02636	5.41E-03	6.17E-07
ethylbenzene	0.01072	2.20E-03	2.51E-07
MEK	0.00019	3.90E-05	4.45E-09
naphthalene	0.00048	9.85E-05	1.12E-08
propylene	0.03127998	6.42E-03	7.32E-07
styrene	0.00126	2.59E-04	2.95E-08
toluene	0.05879998	1.21E-02	1.38E-06
m & p-xylene	0.03639998	7.47E-03	8.52E-07

Vehicle Exhaust Worksheet

Sunset Crossroads

Travel Along Building 10		AADT by Truck Category[1]			
		LDV[2]	**2-Axle[3]**	**3-Axle[4]**	**4+-Axle[5]**
		650	18	22	62
		% of Vehicles That Are Diesel-Powered[6]			
Average Speed		0.2%	1%	89%	93%
		Diesel Exhaust PM10 & PM2.5 Emissions at 5 mph (g/mi)7			
5 mph	PM_{10}	0.0363	2.37E-02	2.37E-02	1.21E-02
	$PM_{2.5}$	0.0348	2.27E-02	2.26E-02	1.16E-02
		% of Vehicles That Are Gasoline-Powered[6]			
		100%	99%	11%	6.7%
		Gasoline Exhaust ROG Emissions at 5 mph (g/mi)7			
	ROG	0.044	0.088	0.211	4.075
		PM_{10}, $PM_{2.5}$ & ROG Exhaust Emissions (g/s)			
	PM_{10}	2.15E-07	2.46E-08	1.86E-06	2.82E-06
	$PM_{2.5}$	2.06E-07	2.35E-08	1.77E-06	2.70E-06
	ROG	1.14E-04	6.28E-06	2.09E-06	6.82E-05

Total distance covered by vehicles traveling along Building 10
558 meters

Number of Sources	**Emission Rates per source**		
	g/s	**lb/hr**	**lb/yr**
59	8.3E-08	6.6E-07	0.0058
59	8.0E-08	6.3E-07	0.0055
59	3.2E-06	2.6E-05	0.2252

[1] AADT from project traffic study

[2] LDV assumed to LDA (Passenger Cars)

[3] 2 axle trucks are assumed to be MDV (Medium-Duty Truck GVW=5,574-8,500 lbs.)

[4] 3 axle trucks are assumed to be MHDT (Medium-Heavy Duty Truck GVW=14,001-33,000 lbs.)

[5] 4+ axle trucks are assumed to be HHDT (Heavy-Heavy Duty Truck GVW=33,001-60,000 lbs.)

[6] Source: EMFAC2021 VMT data

[7] Source: EMFAC2021 emission factors for 2027 (model year aggregate).

Speciated Emissions Rates

		lb/yr	lb/hr
diesel part.	--	5.80E-03	6.61E-07
PM2.5	--	5.54E-03	6.33E-07
1,3-butadiene	0.0055	1.24E-03	1.41E-07
benzene	0.02636	5.94E-03	6.77E-07
ethylbenzene	0.01072	2.41E-03	2.75E-07
MEK	0.00019	4.28E-05	4.88E-09
naphthalene	0.00048	1.08E-04	1.23E-08
propylene	0.03127998	7.04E-03	8.03E-07
styrene	0.00126	2.84E-04	3.24E-08
toluene	0.05879998	1.32E-02	1.51E-06
m & p-xylene	0.03639998	8.20E-03	9.35E-07

Vehicle Exhaust Worksheet

Sunset Crossroads

Bobcat Road Between Bldg 1 W. Drwy & Bldg 1 E. Drwy		AADT by Truck Category[1]			
		LDV[2]	**2-Axle[3]**	**3-Axle[4]**	**4+-Axle[5]**
		622	14	14	106
		% of Vehicles That Are Diesel-Powered[6]			
		0.2%	1%	89%	93%
Average Speed 35 mph		**Diesel Exhaust PM10 & PM2.5 Emissions at 35 mph (g/mi)[7]**			
	PM_{10}	0.0106	7.31E-03	5.03E-03	7.32E-03
	$PM_{2.5}$	0.0101	6.99E-03	4.81E-03	7.00E-03
		% of Vehicles That Are Gasoline-Powered[6]			
		100%	99%	11%	6.7%
		Gasoline Exhaust ROG Emissions at 35 mph (g/mi)[7]			
	ROG	0.006	1.28E-02	2.97E-02	5.80E-01

Total distance covered by select Bobcat Rd. sources
346 meters

		Number of Sources	**Emission Rates per source**		
			g/s	**lb/hr**	**lb/yr**
	PM_{10}, $PM_{2.5}$ & ROG Exhaust Emissions (g/s)				
PM_{10}	3.71E-08	3.75E-09	1.60E-07	1.80E-06	27	7.4E-08	5.9E-07	0.0051
$PM_{2.5}$	3.55E-08	3.58E-09	1.53E-07	1.72E-06	27	7.1E-08	5.6E-07	0.0049
ROG	9.59E-06	4.50E-07	1.20E-07	1.03E-05	27	7.6E-07	6.0E-06	0.0526

Speciated Emissions Rates

		lb/yr	lb/hr
diesel part.	--	5.15E-03	5.87E-07
PM2.5	--	4.92E-03	5.62E-07
1,3-butadiene	0.0055	2.90E-04	3.30E-08
benzene	0.02636	1.39E-03	1.58E-07
ethylbenzene	0.01072	5.64E-04	6.44E-08
MEK	0.00019	1.00E-05	1.14E-09
naphthalene	0.00048	2.53E-05	2.88E-09
propylene	0.03127998	1.65E-03	1.88E-07
styrene	0.00126	6.63E-05	7.57E-09
toluene	0.05879998	3.10E-03	3.53E-07
m & p-xylene	0.03639998	1.92E-03	2.19E-07

[1] AADT from project traffic study, assume 1/4 of Building 1 traffic use this route

[2] LDV assumed to LDA (Passenger Cars)

[3] 2 axle trucks are assumed to be MDV (Medium-Duty Truck GVW=5,574-8,500 lbs.)

[4] 3 axle trucks are assumed to be MHDT (Medium-Heavy Duty Truck GVW=14,001-33,000 lbs.)

[5] 4+ axle trucks are assumed to be HHDT (Heavy-Heavy Duty Truck GVW=33,001-60,000 lbs.)

[6] Source: EMFAC2021 VMT data

[7] Source: EMFAC2021 emission factors for 2027 (model year aggregate).

Vehicle Exhaust Worksheet

Sunset Crossroads

Bobcat Road Between Bldg 2 W. Drwy & Bldg 2 E. Drwy		AADT by Truck Category[1]			
		LDV[2]	**2-Axle[3]**	**3-Axle[4]**	**4+-Axle[5]**
		1,850	43	43	315
		% of Vehicles That Are Diesel-Powered[6]			
		0.2%	1%	89%	93%
Average Speed 35 mph		**Diesel Exhaust PM10 & PM2.5 Emissions at 35 mph (g/mi)[7]**			
	PM_{10}	0.0106	7.31E-03	5.03E-03	7.32E-03
	$PM_{2.5}$	0.0101	6.99E-03	4.81E-03	7.00E-03
		% of Vehicles That Are Gasoline-Powered[6]			
		100%	99%	11%	6.7%
		Gasoline Exhaust ROG Emissions at 35 mph (g/mi)[7]			
	ROG	0.006	1.28E-02	2.97E-02	5.80E-01
		PM_{10}, $PM_{2.5}$ & ROG Exhaust Emissions (g/s)			
	PM_{10}	1.10E-07	1.12E-08	4.77E-07	5.36E-06
	$PM_{2.5}$	1.06E-07	1.07E-08	4.56E-07	5.13E-06
	ROG	2.85E-05	1.34E-06	3.57E-07	3.06E-05

Total distance covered by select Bobcat Rd. sources
346 meters

Number of Sources	**Emission Rates per source**		
	g/s	**lb/hr**	**lb/yr**
27	2.2E-07	1.8E-06	0.0153
27	2.1E-07	1.7E-06	0.0147
27	2.3E-06	1.8E-05	0.1568

Speciated Emissions Rates

		lb/yr	lb/hr
diesel part.	--	1.53E-02	1.75E-06
PM2.5	--	1.47E-02	1.67E-06
1,3-butadiene	0.0055	8.62E-04	9.84E-08
benzene	0.02636	4.13E-03	4.72E-07
ethylbenzene	0.01072	1.68E-03	1.92E-07
MEK	0.00019	2.98E-05	3.40E-09
naphthalene	0.00048	7.53E-05	8.59E-09
propylene	0.03127998	4.91E-03	5.60E-07
styrene	0.00126	1.98E-04	2.25E-08
toluene	0.05879998	9.22E-03	1.05E-06
m & p-xylene	0.03639998	5.71E-03	6.51E-07

[1] AADT from project traffic study, assume 1/2 of Building 1 traffic & 1/4 of Building 2 traffic use this route

[2] LDV assumed to LDA (Passenger Cars)

[3] 2 axle trucks are assumed to be MDV (Medium-Duty Truck GVW=5,574-8,500 lbs.)

[4] 3 axle trucks are assumed to be MHDT (Medium-Heavy Duty Truck GVW=14,001-33,000 lbs.)

[5] 4+ axle trucks are assumed to be HHDT (Heavy-Heavy Duty Truck GVW=33,001-60,000 lbs.)

[6] Source: EMFAC2021 VMT data

[7] Source: EMFAC2021 emission factors for 2027 (model year aggregate).

Vehicle Exhaust Worksheet

Sunset Crossroads

Bobcat Road & S. Sunset Ave. Between Bldg 3 W. Drwy & Bldg 3 E. Drwy Average Speed 35 mph		AADT by Truck Category[1]			
		LDV[2]	**2-Axle[3]**	**3-Axle[4]**	**4+-Axle[5]**
		2,959	69	69	506
		% of Vehicles That Are Diesel-Powered[6]			
		0.2%	1%	89%	93%
		Diesel Exhaust PM10 & PM2.5 Emissions at 35 mph (g/mi)[7]			
	PM_{10}	0.0106	7.31E-03	5.03E-03	7.32E-03
	$PM_{2.5}$	0.0101	6.99E-03	4.81E-03	7.00E-03
		% of Vehicles That Are Gasoline-Powered[6]			
		100%	99%	11%	6.7%
		Gasoline Exhaust ROG Emissions at 35 mph (g/mi)[7]			
	ROG	0.006	1.28E-02	2.97E-02	5.80E-01
		PM_{10}, $PM_{2.5}$ & ROG Exhaust Emissions (g/s)			
	PM_{10}	2.02E-07	2.05E-08	8.74E-07	9.82E-06
	$PM_{2.5}$	1.93E-07	1.96E-08	8.36E-07	9.40E-06
	ROG	5.22E-05	2.46E-06	6.54E-07	5.61E-05

Total distance covered by select Bobcat Rd. sources
396 meters

Number of Sources	**Emission Rates per source**		
	g/s	**lb/hr**	**lb/yr**
31	3.5E-07	2.8E-06	0.0245
31	3.4E-07	2.7E-06	0.0234
31	3.6E-06	2.9E-05	0.2501

Speciated Emissions Rates

		lb/yr	lb/hr
diesel part.	--	2.45E-02	2.80E-06
PM2.5	--	2.34E-02	2.67E-06
1,3-butadiene	0.0055	1.38E-03	1.57E-07
benzene	0.02636	6.59E-03	7.52E-07
ethylbenzene	0.01072	2.68E-03	3.06E-07
MEK	0.00019	4.75E-05	5.42E-09
naphthalene	0.00048	1.20E-04	1.37E-08
propylene	0.03127998	7.82E-03	8.93E-07
styrene	0.00126	3.15E-04	3.60E-08
toluene	0.05879998	1.47E-02	1.68E-06
m & p-xylene	0.03639998	9.11E-03	1.04E-06

[1] AADT from project traffic study, assume 1/2 of Building 1 traffic & 1/2 of Building 2 traffic & 1/2 of Building 3 traffic use this route

[2] LDV assumed to LDA (Passenger Cars)

[3] 2 axle trucks are assumed to be MDV (Medium-Duty Truck GVW=5,574-8,500 lbs.)

[4] 3 axle trucks are assumed to be MHDT (Medium-Heavy Duty Truck GVW=14,001-33,000 lbs.)

[5] 4+ axle trucks are assumed to be HHDT (Heavy-Heavy Duty Truck GVW=33,001-60,000 lbs.)

[6] Source: EMFAC2021 VMT data

[7] Source: EMFAC2021 emission factors for 2027 (model year aggregate).

Vehicle Exhaust Worksheet

Sunset Crossroads

Sunset Ave. Between Bldg 3 S. Drwy & N. Drwy		AADT by Truck Category[1]			
		LDV[2]	**2-Axle[3]**	**3-Axle[4]**	**4+-Axle[5]**
		3,211	75	75	549
		% of Vehicles That Are Diesel-Powered[6]			
		0.2%	1%	89%	93%
Average Speed 35 mph		**Diesel Exhaust PM10 & PM2.5 Emissions at 35 mph (g/mi)[7]**			
	PM_{10}	0.0106	7.31E-03	5.03E-03	7.32E-03
	$PM_{2.5}$	0.0101	6.99E-03	4.81E-03	7.00E-03
		% of Vehicles That Are Gasoline-Powered[6]			
		100%	99%	11%	6.7%
		Gasoline Exhaust ROG Emissions at 35 mph (g/mi)[7]			
	ROG	0.006	1.28E-02	2.97E-02	5.80E-01
		PM_{10}, $PM_{2.5}$ & ROG Exhaust Emissions (g/s)			
	PM_{10}	1.62E-07	1.65E-08	7.02E-07	7.89E-06
	$PM_{2.5}$	1.55E-07	1.57E-08	6.72E-07	7.55E-06
	ROG	4.19E-05	1.98E-06	5.26E-07	4.51E-05

Total distance covered by select Sunset Ave. sources
293 meters

Number of Sources	**Emission Rates per source**		
	g/s	**lb/hr**	**lb/yr**
23	3.8E-07	3.0E-06	0.0265
23	3.6E-07	2.9E-06	0.0254
23	3.9E-06	3.1E-05	0.2708

Speciated Emissions Rates

		lb/yr	lb/hr
diesel part.	--	2.65E-02	3.03E-06
PM2.5	--	2.54E-02	2.90E-06
1,3-butadiene	0.0055	1.49E-03	1.70E-07
benzene	0.02636	7.14E-03	8.14E-07
ethylbenzene	0.01072	2.90E-03	3.31E-07
MEK	0.00019	5.14E-05	5.87E-09
naphthalene	0.00048	1.30E-04	1.48E-08
propylene	0.03127998	8.47E-03	9.66E-07
styrene	0.00126	3.41E-04	3.89E-08
toluene	0.05879998	1.59E-02	1.82E-06
m & p-xylene	0.03639998	9.86E-03	1.12E-06

[1] AADT from project traffic study, assume 1/2 of Building 1 traffic & 1/2 of Building 2 traffic & 3/4 of Building 3 traffic use this route

[2] LDV assumed to LDA (Passenger Cars)

[3] 2 axle trucks are assumed to be MDV (Medium-Duty Truck GVW=5,574-8,500 lbs.)

[4] 3 axle trucks are assumed to be MHDT (Medium-Heavy Duty Truck GVW=14,001-33,000 lbs.)

[5] 4+ axle trucks are assumed to be HHDT (Heavy-Heavy Duty Truck GVW=33,001-60,000 lbs.)

[6] Source: EMFAC2021 VMT data

[7] Source: EMFAC2021 emission factors for 2027 (model year aggregate).

Vehicle Exhaust Worksheet

Sunset Crossroads

Sunset Ave. Between Bldg 3 N. Drwy & Bldg 4		AADT by Truck Category[1]			
		LDV[2]	**2-Axle[3]**	**3-Axle[4]**	**4+-Axle[5]**
		3,462	81	81	592
		% of Vehicles That Are Diesel-Powered[6]			
		0.2%	1%	89%	93%
Average Speed 35 mph		**Diesel Exhaust PM10 & PM2.5 Emissions at 35 mph (g/mi)[7]**			
	PM_{10}	0.0106	7.31E-03	5.03E-03	7.32E-03
	$PM_{2.5}$	0.0101	6.99E-03	4.81E-03	7.00E-03
		% of Vehicles That Are Gasoline-Powered[6]			
		100%	99%	11%	6.7%
		Gasoline Exhaust ROG Emissions at 35 mph (g/mi)[7]			
	ROG	0.006	1.28E-02	2.97E-02	5.80E-01
		PM_{10}, $PM_{2.5}$ & ROG Exhaust Emissions (g/s)			
	PM_{10}	1.03E-07	1.05E-08	4.47E-07	5.03E-06
	$PM_{2.5}$	9.89E-08	1.00E-08	4.28E-07	4.81E-06
	ROG	2.67E-05	1.26E-06	3.35E-07	2.88E-05

Total distance covered by select Sunset Ave. sources
173 meters

Number of Sources	**Emission Rates per source**		
	g/s	**lb/hr**	**lb/yr**
14	4.0E-07	3.2E-06	0.0278
14	3.8E-07	3.0E-06	0.0266
14	4.1E-06	3.2E-05	0.2835

Speciated Emissions Rates

		lb/yr	lb/hr
diesel part.	--	2.78E-02	3.17E-06
PM2.5	--	2.66E-02	3.03E-06
1,3-butadiene	0.0055	1.56E-03	1.78E-07
benzene	0.02636	7.47E-03	8.53E-07
ethylbenzene	0.01072	3.04E-03	3.47E-07
MEK	0.00019	5.39E-05	6.15E-09
naphthalene	0.00048	1.36E-04	1.55E-08
propylene	0.03127998	8.87E-03	1.01E-06
styrene	0.00126	3.57E-04	4.08E-08
toluene	0.05879998	1.67E-02	1.90E-06
m & p-xylene	0.03639998	1.03E-02	1.18E-06

[1] AADT from project traffic study, assume 1/2 of Building 1 traffic & 1/2 of Building 2 traffic & all of Building 3 traffic use this route

[2] LDV assumed to LDA (Passenger Cars)

[3] 2 axle trucks are assumed to be MDV (Medium-Duty Truck GVW=5,574-8,500 lbs.)

[4] 3 axle trucks are assumed to be MHDT (Medium-Heavy Duty Truck GVW=14,001-33,000 lbs.)

[5] 4+ axle trucks are assumed to be HHDT (Heavy-Heavy Duty Truck GVW=33,001-60,000 lbs.)

[6] Source: EMFAC2021 VMT data

[7] Source: EMFAC2021 emission factors for 2027 (model year aggregate).

Vehicle Exhaust Worksheet

Sunset Crossroads

Sunset Ave. Between Bldg 4 & Westward Ave.		AADT by Truck Category[1]			
		LDV[2]	**2-Axle[3]**	**3-Axle[4]**	**4+-Axle[5]**
		3,664	85	85	604
		% of Vehicles That Are Diesel-Powered[6]			
		0.2%	1%	89%	93%
Average Speed 35 mph		**Diesel Exhaust PM10 & PM2.5 Emissions at 35 mph (g/mi)[7]**			
	PM_{10}	0.0106	7.31E-03	5.03E-03	7.32E-03
	$PM_{2.5}$	0.0101	6.99E-03	4.81E-03	7.00E-03
		% of Vehicles That Are Gasoline-Powered[6]			
		100%	99%	11%	6.7%
		Gasoline Exhaust ROG Emissions at 35 mph (g/mi)[7]			
	ROG	0.006	1.28E-02	2.97E-02	5.80E-01
		PM_{10}, $PM_{2.5}$ & ROG Exhaust Emissions (g/s)			
	PM_{10}	1.27E-07	1.27E-08	5.44E-07	5.94E-06
	$PM_{2.5}$	1.21E-07	1.22E-08	5.20E-07	5.68E-06
	ROG	3.27E-05	1.53E-06	4.07E-07	3.40E-05

Total distance covered by select Sunset Ave. sources
200 meters

Number of Sources	**Emission Rates per source**		
	g/s	**lb/hr**	**lb/yr**
16	4.1E-07	3.3E-06	0.0288
16	4.0E-07	3.1E-06	0.0276
16	4.3E-06	3.4E-05	0.2983

Speciated Emissions Rates

		lb/yr	lb/hr
diesel part.	--	2.88E-02	3.29E-06
PM2.5	--	2.76E-02	3.14E-06
1,3-butadiene	0.0055	1.64E-03	1.87E-07
benzene	0.02636	7.86E-03	8.97E-07
ethylbenzene	0.01072	3.20E-03	3.65E-07
MEK	0.00019	5.67E-05	6.47E-09
naphthalene	0.00048	1.43E-04	1.63E-08
propylene	0.03127998	9.33E-03	1.06E-06
styrene	0.00126	3.76E-04	4.29E-08
toluene	0.05879998	1.75E-02	2.00E-06
m & p-xylene	0.03639998	1.09E-02	1.24E-06

[1] AADT from project traffic study, assume 1/2 of Building 1 traffic & 1/2 of Building 2 traffic & all of Buildings 3 & 4 traffic use this route

[2] LDV assumed to LDA (Passenger Cars)

[3] 2 axle trucks are assumed to be MDV (Medium-Duty Truck GVW=5,574-8,500 lbs.)

[4] 3 axle trucks are assumed to be MHDT (Medium-Heavy Duty Truck GVW=14,001-33,000 lbs.)

[5] 4+ axle trucks are assumed to be HHDT (Heavy-Heavy Duty Truck GVW=33,001-60,000 lbs.)

[6] Source: EMFAC2021 VMT data

[7] Source: EMFAC2021 emission factors for 2027 (model year aggregate).

Vehicle Exhaust Worksheet

Sunset Crossroads

Sunset Ave. Between Westward Ave. & Lincoln St.		AADT by Truck Category[1]			
		LDV[2]	**2-Axle[3]**	**3-Axle[4]**	**4+-Axle[5]**
		7,404	222	225	1,232
		% of Vehicles That Are Diesel-Powered[6]			
		0.2%	1%	89%	93%
Average Speed		**Diesel Exhaust PM10 & PM2.5 Emissions at 35 mph (g/mi)7**			
35 mph	PM_{10}	0.0106	7.31E-03	5.03E-03	7.32E-03
	$PM_{2.5}$	0.0101	6.99E-03	4.81E-03	7.00E-03
		Diesel Exhaust PM10 & PM2.5 Emissions from TRUs (g/hr)			
	PM_{10}	N/A	1.97E-01	1.97E-01	1.97E-01
	$PM_{2.5}$	N/A	1.81E-01	1.81E-01	1.81E-01
		% of Vehicles That Are Gasoline-Powered[6]			
		100%	99%	11%	6.7%
		Gasoline Exhaust ROG Emissions at 35 mph (g/mi)7			
	ROG	0.006	1.28E-02	2.97E-02	5.80E-01
		PM_{10}, $PM_{2.5}$ & ROG Exhaust Emissions (g/s)			
	PM_{10}	4.54E-07	4.27E-07	2.74E-06	2.22E-05
	$PM_{2.5}$	4.34E-07	3.95E-07	2.62E-06	2.12E-05
	ROG	1.17E-04	7.14E-06	1.92E-06	1.23E-04

Total distance covered by select Sunset Ave. sources
356 meters

Number of Sources	**Emission Rates per source**		
	g/s	**lb/hr**	**lb/yr**
22	1.2E-06	9.3E-06	0.0817
22	1.1E-06	8.9E-06	0.0780
22	1.1E-05	9.0E-05	0.7883

Speciated Emissions Rates

		lb/yr	lb/hr
diesel part.	--	8.17E-02	9.32E-06
PM2.5	--	7.80E-02	8.90E-06
1,3-butadiene	0.0055	4.34E-03	4.95E-07
benzene	0.02636	2.08E-02	2.37E-06
ethylbenzene	0.01072	8.45E-03	9.64E-07
MEK	0.00019	1.50E-04	1.71E-08
naphthalene	0.00048	3.78E-04	4.32E-08
propylene	0.03127998	2.47E-02	2.81E-06
styrene	0.00126	9.93E-04	1.13E-07
toluene	0.05879998	4.64E-02	5.29E-06
m & p-xylene	0.03639998	2.87E-02	3.27E-06

[1] AADT from project traffic study, assume 90% of Bldgs 1, 2, 7, 9, & 10 traffic, all of Bldgs 3 & 4 traffic, and 1/2 of Bldg 5 traffic use this route

[2] LDV assumed to LDA (Passenger Cars)

[3] 2 axle trucks are assumed to be MDV (Medium-Duty Truck GVW=5,574-8,500 lbs.)

[4] 3 axle trucks are assumed to be MHDT (Medium-Heavy Duty Truck GVW=14,001-33,000 lbs.)

[5] 4+ axle trucks are assumed to be HHDT (Heavy-Heavy Duty Truck GVW=33,001-60,000 lbs.)

Vehicle Exhaust Worksheet

Sunset Crossroads

Sunset Ave. Between Lincoln St. & I-10 EB Ramp		AADT by Truck Category[1]			
		LDV[2]	**2-Axle[3]**	**3-Axle[4]**	**4+-Axle[5]**
		8,790	313	277	1,426
		% of Vehicles That Are Diesel-Powered[6]			
		0.2%	1%	89%	93%
Average Speed 35 mph		**Diesel Exhaust PM10 & PM2.5 Emissions at 35 mph (g/mi)7**			
	PM_{10}	0.0106	7.31E-03	5.03E-03	7.32E-03
	$PM_{2.5}$	0.0101	6.99E-03	4.81E-03	7.00E-03
		Diesel Exhaust PM10 & PM2.5 Emissions from TRUs (g/hr)			
	PM_{10}	N/A	1.97E-01	1.97E-01	1.97E-01
	$PM_{2.5}$	N/A	1.81E-01	1.81E-01	1.81E-01
		% of Vehicles That Are Gasoline-Powered[6]			
		100%	99%	11%	6.7%
		Gasoline Exhaust ROG Emissions at 35 mph (g/mi)7			
	ROG	0.006	1.28E-02	2.97E-02	5.80E-01
		PM_{10}, $PM_{2.5}$ & ROG Exhaust Emissions (g/s)			
	PM_{10}	3.86E-07	1.07E-06	2.69E-06	1.96E-05
	$PM_{2.5}$	3.69E-07	9.86E-07	2.56E-06	1.87E-05
	ROG	9.97E-05	7.19E-06	1.69E-06	1.02E-04

Total distance covered by select Sunset Ave. sources
254 meters

Number of Sources	**Emission Rates per source**		
	g/s	**lb/hr**	**lb/yr**
16	1.5E-06	1.2E-05	0.1035
16	1.4E-06	1.1E-05	0.0985
16	1.3E-05	1.0E-04	0.9147

Speciated Emissions Rates

		lb/yr	lb/hr
diesel part.	--	1.03E-01	1.18E-05
PM2.5	--	9.85E-02	1.12E-05
1,3-butadiene	0.0055	5.03E-03	5.74E-07
benzene	0.02636	2.41E-02	2.75E-06
ethylbenzene	0.01072	9.81E-03	1.12E-06
MEK	0.00019	1.74E-04	1.98E-08
naphthalene	0.00048	4.39E-04	5.01E-08
propylene	0.03127998	2.86E-02	3.26E-06
styrene	0.00126	1.15E-03	1.31E-07
toluene	0.05879998	5.38E-02	6.14E-06
m & p-xylene	0.03639998	3.33E-02	3.80E-06

[1] AADT from project traffic study, assume 90% of Bldgs 1, 2, 7, 9, & 10 traffic, all of Bldgs 3, 4, 5, 6, & 8 traffic use this route

[2] LDV assumed to LDA (Passenger Cars)

[3] 2 axle trucks are assumed to be MDV (Medium-Duty Truck GVW=5,574-8,500 lbs.)

[4] 3 axle trucks are assumed to be MHDT (Medium-Heavy Duty Truck GVW=14,001-33,000 lbs.)

[5] 4+ axle trucks are assumed to be HHDT (Heavy-Heavy Duty Truck GVW=33,001-60,000 lbs.)

Vehicle Exhaust Worksheet

Sunset Crossroads

Sunset Ave. Between I-10 EB Ramps and I-10 WB Ramps		AADT by Truck Category[1]			
		LDV[2]	2-Axle[3]	3-Axle[4]	4+-Axle[5]
		4,834	172	152	784
		% of Vehicles That Are Diesel-Powered[6]			
		0.2%	1%	89%	93%
Average Speed 35 mph		Diesel Exhaust PM10 & PM2.5 Emissions at 35 mph (g/mi)7			
	PM_{10}	0.0106	7.31E-03	5.03E-03	7.32E-03
	$PM_{2.5}$	0.0101	6.99E-03	4.81E-03	7.00E-03
		Diesel Exhaust PM10 & PM2.5 Emissions from TRUs (g/hr)			
	PM_{10}	N/A	1.97E-01	1.97E-01	1.97E-01
	$PM_{2.5}$	N/A	1.81E-01	1.81E-01	1.81E-01
		% of Vehicles That Are Gasoline-Powered[6]			
		100%	99%	11%	6.7%
		Gasoline Exhaust ROG Emissions at 35 mph (g/mi)7			
	ROG	0.006	1.28E-02	2.97E-02	5.80E-01
		PM_{10}, $PM_{2.5}$ & ROG Exhaust Emissions (g/s)			
	PM_{10}	8.88E-08	2.46E-07	6.20E-07	4.52E-06
	$PM_{2.5}$	8.49E-08	2.27E-07	5.90E-07	4.31E-06
	ROG	2.29E-05	1.66E-06	3.90E-07	2.34E-05

Total distance covered by select Sunset Ave. sources
106 meters

Number of Sources	Emission Rates per source		
	g/s	lb/hr	lb/yr
9	6.1E-07	4.8E-06	0.0423
9	5.8E-07	4.6E-06	0.0403
9	5.4E-06	4.3E-05	0.3744

Speciated Emissions Rates

		lb/yr	lb/hr
diesel part.	--	4.23E-02	4.83E-06
PM2.5	--	4.03E-02	4.60E-06
1,3-butadiene	0.0055	2.06E-03	2.35E-07
benzene	0.02636	9.87E-03	1.13E-06
ethylbenzene	0.01072	4.01E-03	4.58E-07
MEK	0.00019	7.11E-05	8.11E-09
naphthalene	0.00048	1.80E-04	2.05E-08
propylene	0.03127998	1.17E-02	1.34E-06
styrene	0.00126	4.72E-04	5.38E-08
toluene	0.05879998	2.20E-02	2.51E-06
m & p-xylene	0.03639998	1.36E-02	1.55E-06

[1] AADT from project traffic study, assume 49.5% of Bldgs 1, 2, 7, 9, & 10 traffic, 55% of Bldgs 3, 4, 5, 6, & 8 traffic use this route

[2] LDV assumed to LDA (Passenger Cars)

[3] 2 axle trucks are assumed to be MDV (Medium-Duty Truck GVW=5,574-8,500 lbs.)

[4] 3 axle trucks are assumed to be MHDT (Medium-Heavy Duty Truck GVW=14,001-33,000 lbs.)

[5] 4+ axle trucks are assumed to be HHDT (Heavy-Heavy Duty Truck GVW=33,001-60,000 lbs.)

Vehicle Exhaust Worksheet

Sunset Crossroads

Westward Ave. from Sunset Ave. to Bldg 2 E. Drwy		AADT by Truck Category[1]			
		LDV[2]	2-Axle[3]	3-Axle[4]	4+-Axle[5]
		3,973	141	145	665
		% of Vehicles That Are Diesel-Powered[6]			
		0.2%	1%	89%	93%
Average Speed		Diesel Exhaust PM10 & PM2.5 Emissions at 35 mph (g/mi)7			
35 mph	PM_{10}	0.0106	7.31E-03	5.03E-03	7.32E-03
	$PM_{2.5}$	0.0101	6.99E-03	4.81E-03	7.00E-03
		Diesel Exhaust PM10 & PM2.5 Emissions from TRUs (g/hr)			
	PM_{10}	N/A	1.97E-01	1.97E-01	1.97E-01
	$PM_{2.5}$	N/A	1.81E-01	1.81E-01	1.81E-01
		% of Vehicles That Are Gasoline-Powered[6]			
		100%	99%	11%	6.7%
		Gasoline Exhaust ROG Emissions at 35 mph (g/mi)7			
	ROG	0.006	1.28E-02	2.97E-02	5.80E-01
		PM_{10}, $PM_{2.5}$ & ROG Exhaust Emissions (g/s)			
	PM_{10}	2.44E-07	3.69E-07	1.81E-06	1.23E-05
	$PM_{2.5}$	2.33E-07	3.41E-07	1.73E-06	1.17E-05
	ROG	6.31E-05	4.54E-06	1.24E-06	6.64E-05

Total distance covered by select Westward Ave. sources
356 meters

Number of Sources	Emission Rates per source		
	g/s	lb/hr	lb/yr
23	6.4E-07	5.1E-06	0.0444
23	6.1E-07	4.8E-06	0.0424
23	5.9E-06	4.7E-05	0.4092

Speciated Emissions Rates

		lb/yr	lb/hr
diesel part.	--	4.44E-02	5.07E-06
PM2.5	--	4.24E-02	4.84E-06
1,3-butadiene	0.0055	2.25E-03	2.57E-07
benzene	0.02636	1.08E-02	1.23E-06
ethylbenzene	0.01072	4.39E-03	5.00E-07
MEK	0.00019	7.77E-05	8.87E-09
naphthalene	0.00048	1.96E-04	2.24E-08
propylene	0.03127998	1.28E-02	1.46E-06
styrene	0.00126	5.16E-04	5.88E-08
toluene	0.05879998	2.41E-02	2.74E-06
m & p-xylene	0.03639998	1.49E-02	1.70E-06

[1] AADT from project traffic study, assume 45% of Bldgs 1, 2 & 5 traffic and 90% of Bldgs 7, 9, & 10 traffic use this route

[2] LDV assumed to LDA (Passenger Cars)

[3] 2 axle trucks are assumed to be MDV (Medium-Duty Truck GVW=5,574-8,500 lbs.)

[4] 3 axle trucks are assumed to be MHDT (Medium-Heavy Duty Truck GVW=14,001-33,000 lbs.)

[5] 4+ axle trucks are assumed to be HHDT (Heavy-Heavy Duty Truck GVW=33,001-60,000 lbs.)

Vehicle Exhaust Worksheet

Sunset Crossroads

Westward Ave. from Bldg 2 E. Drwy to Bldg 2 W. Drwy		AADT by Truck Category[1]			
		LDV[2]	**2-Axle[3]**	**3-Axle[4]**	**4+-Axle[5]**
		3,052	113	113	515
		% of Vehicles That Are Diesel-Powered[6]			
		0.2%	1%	89%	93%
Average Speed 35 mph		**Diesel Exhaust PM10 & PM2.5 Emissions at 35 mph (g/mi)7**			
	PM_{10}	0.0106	7.31E-03	5.03E-03	7.32E-03
	$PM_{2.5}$	0.0101	6.99E-03	4.81E-03	7.00E-03
		Diesel Exhaust PM10 & PM2.5 Emissions from TRUs (g/hr)			
	PM_{10}	N/A	1.97E-01	1.97E-01	1.97E-01
	$PM_{2.5}$	N/A	1.81E-01	1.81E-01	1.81E-01
		% of Vehicles That Are Gasoline-Powered[6]			
		100%	99%	11%	6.7%
		Gasoline Exhaust ROG Emissions at 35 mph (g/mi)7			
	ROG	0.006	1.28E-02	2.97E-02	5.80E-01
		PM_{10}, $PM_{2.5}$ & ROG Exhaust Emissions (g/s)			
	PM_{10}	1.61E-07	3.10E-07	1.24E-06	8.27E-06
	$PM_{2.5}$	1.54E-07	2.86E-07	1.19E-06	7.89E-06
	ROG	4.15E-05	3.12E-06	8.32E-07	4.41E-05

Total distance covered by select Westward Ave. sources
305 meters

Number of Sources	**Emission Rates per source**		
	g/s	**lb/hr**	**lb/yr**
19	5.3E-07	4.2E-06	0.0365
19	5.0E-07	4.0E-06	0.0348
19	4.7E-06	3.7E-05	0.3281

[1] AADT from project traffic study, assume 45% of Bldgs 1, 5, & 7 traffic, 22.5% of Bldg 2 traffic, and 90% of Bldgs 9 & 10 traffic use this route

[2] LDV assumed to LDA (Passenger Cars)

[3] 2 axle trucks are assumed to be MDV (Medium-Duty Truck GVW=5,574-8,500 lbs.)

[4] 3 axle trucks are assumed to be MHDT (Medium-Heavy Duty Truck GVW=14,001-33,000 lbs.)

[5] 4+ axle trucks are assumed to be HHDT (Heavy-Heavy Duty Truck GVW=33,001-60,000 lbs.)

Speciated Emissions Rates

		lb/yr	lb/hr
diesel part.	--	3.65E-02	4.17E-06
PM2.5	--	3.48E-02	3.97E-06
1,3-butadiene	0.0055	1.80E-03	2.06E-07
benzene	0.02636	8.65E-03	9.87E-07
ethylbenzene	0.01072	3.52E-03	4.01E-07
MEK	0.00019	6.23E-05	7.11E-09
naphthalene	0.00048	1.57E-04	1.80E-08
propylene	0.03127998	1.03E-02	1.17E-06
styrene	0.00126	4.13E-04	4.72E-08
toluene	0.05879998	1.93E-02	2.20E-06
m & p-xylene	0.03639998	1.19E-02	1.36E-06

Vehicle Exhaust Worksheet

Sunset Crossroads

Westward Ave. from Bldg 2 W. Drwy to Bldg 1 W. Drwy		AADT by Truck Category[1]			
		LDV[2]	**2-Axle[3]**	**3-Axle[4]**	**4+-Axle[5]**
		1,809	63	70	289
		% of Vehicles That Are Diesel-Powered[6]			
		0.2%	1%	89%	93%
Average Speed		**Diesel Exhaust PM10 & PM2.5 Emissions at 35 mph (g/mi)7**			
35 mph	PM_{10}	0.0106	7.31E-03	5.03E-03	7.32E-03
	$PM_{2.5}$	0.0101	6.99E-03	4.81E-03	7.00E-03
		Diesel Exhaust PM10 & PM2.5 Emissions from TRUs (g/hr)			
	PM_{10}	N/A	1.97E-01	1.97E-01	1.97E-01
	$PM_{2.5}$	N/A	1.81E-01	1.81E-01	1.81E-01
		% of Vehicles That Are Gasoline-Powered[6]			
		100%	99%	11%	6.7%
		Gasoline Exhaust ROG Emissions at 35 mph (g/mi)7			
	ROG	0.006	1.28E-02	2.97E-02	5.80E-01
		PM_{10}, $PM_{2.5}$ & ROG Exhaust Emissions (g/s)			
	PM_{10}	1.01E-07	8.19E-08	7.58E-07	4.70E-06
	$PM_{2.5}$	9.62E-08	7.59E-08	7.24E-07	4.49E-06
	ROG	2.60E-05	1.84E-06	5.44E-07	2.61E-05

Total distance covered by select Westward Ave. sources
322 meters

Number of Sources	**Emission Rates per source**		
	g/s	**lb/hr**	**lb/yr**
20	2.8E-07	2.2E-06	0.0196
20	2.7E-07	2.1E-06	0.0187
20	2.7E-06	2.2E-05	0.1896

Speciated Emissions Rates

		lb/yr	lb/hr
diesel part.	--	1.96E-02	2.24E-06
PM2.5	--	1.87E-02	2.14E-06
1,3-butadiene	0.0055	1.04E-03	1.19E-07
benzene	0.02636	5.00E-03	5.70E-07
ethylbenzene	0.01072	2.03E-03	2.32E-07
MEK	0.00019	3.60E-05	4.11E-09
naphthalene	0.00048	9.10E-05	1.04E-08
propylene	0.03127998	5.93E-03	6.77E-07
styrene	0.00126	2.39E-04	2.73E-08
toluene	0.05879998	1.11E-02	1.27E-06
m & p-xylene	0.03639998	6.90E-03	7.87E-07

[1] AADT from project traffic study, assume 10% of Bldgs 2, 5, & 7 traffic, 22.5% of Bldg 1 traffic, and 90% of Bldgs 9 & 10 traffic use this route

[2] LDV assumed to LDA (Passenger Cars)

[3] 2 axle trucks are assumed to be MDV (Medium-Duty Truck GVW=5,574-8,500 lbs.)

[4] 3 axle trucks are assumed to be MHDT (Medium-Heavy Duty Truck GVW=14,001-33,000 lbs.)

[5] 4+ axle trucks are assumed to be HHDT (Heavy-Heavy Duty Truck GVW=33,001-60,000 lbs.)

Vehicle Exhaust Worksheet

Sunset Crossroads

Westward Ave. from Bldg 1 W. Drwy to Bldg 10 Drwy		AADT by Truck Category[1]			
		LDV[2]	**2-Axle[3]**	**3-Axle[4]**	**4+-Axle[5]**
		1,498	56	63	236
		% of Vehicles That Are Diesel-Powered[6]			
		0.2%	1%	89%	93%
Average Speed		**Diesel Exhaust PM10 & PM2.5 Emissions at 35 mph (g/mi)7**			
35 mph	PM_{10}	0.0106	7.31E-03	5.03E-03	7.32E-03
	$PM_{2.5}$	0.0101	6.99E-03	4.81E-03	7.00E-03
		Diesel Exhaust PM10 & PM2.5 Emissions from TRUs (g/hr)			
	PM_{10}	N/A	1.97E-01	1.97E-01	1.97E-01
	$PM_{2.5}$	N/A	1.81E-01	1.81E-01	1.81E-01
		% of Vehicles That Are Gasoline-Powered[6]			
		100%	99%	11%	6.7%
		Gasoline Exhaust ROG Emissions at 35 mph (g/mi)7			
	ROG	0.006	1.28E-02	2.97E-02	5.80E-01
		PM_{10}, $PM_{2.5}$ & ROG Exhaust Emissions (g/s)			
	PM_{10}	8.77E-08	8.43E-08	7.19E-07	4.07E-06
	$PM_{2.5}$	8.39E-08	7.82E-08	6.87E-07	3.88E-06
	ROG	2.27E-05	1.71E-06	5.14E-07	2.25E-05

Total distance covered by select Westward Ave. sources
339 meters

Number of Sources	**Emission Rates per source**		
	g/s	**lb/hr**	**lb/yr**
21	2.4E-07	1.9E-06	0.0164
21	2.3E-07	1.8E-06	0.0157
21	2.3E-06	1.8E-05	0.1569

Speciated Emissions Rates

		lb/yr	lb/hr
diesel part.	--	1.64E-02	1.87E-06
PM2.5	--	1.57E-02	1.79E-06
1,3-butadiene	0.0055	8.63E-04	9.84E-08
benzene	0.02636	4.13E-03	4.72E-07
ethylbenzene	0.01072	1.68E-03	1.92E-07
MEK	0.00019	2.98E-05	3.40E-09
naphthalene	0.00048	7.53E-05	8.59E-09
propylene	0.03127998	4.91E-03	5.60E-07
styrene	0.00126	1.98E-04	2.25E-08
toluene	0.05879998	9.22E-03	1.05E-06
m & p-xylene	0.03639998	5.71E-03	6.51E-07

[1] AADT from project traffic study, assume 10% of Bldgs 1, 2, 5, & 7 traffic and 90% of Bldgs 9 & 10 traffic use this route

[2] LDV assumed to LDA (Passenger Cars)

[3] 2 axle trucks are assumed to be MDV (Medium-Duty Truck GVW=5,574-8,500 lbs.)

[4] 3 axle trucks are assumed to be MHDT (Medium-Heavy Duty Truck GVW=14,001-33,000 lbs.)

[5] 4+ axle trucks are assumed to be HHDT (Heavy-Heavy Duty Truck GVW=33,001-60,000 lbs.)

Vehicle Exhaust Worksheet

Sunset Crossroads

Westward Ave. from Bldg 10 Drwy to Highland Home Rd.		AADT by Truck Category[1]			
		LDV[2]	**2-Axle[3]**	**3-Axle[4]**	**4+-Axle[5]**
		978	42	45	186
		% of Vehicles That Are Diesel-Powered[6]			
		0.2%	1%	89%	93%
Average Speed		**Diesel Exhaust PM10 & PM2.5 Emissions at 35 mph (g/mi)7**			
35 mph	PM_{10}	0.0106	7.31E-03	5.03E-03	7.32E-03
	$PM_{2.5}$	0.0101	6.99E-03	4.81E-03	7.00E-03
		Diesel Exhaust PM10 & PM2.5 Emissions from TRUs (g/hr)			
	PM_{10}	N/A	1.97E-01	1.97E-01	1.97E-01
	$PM_{2.5}$	N/A	1.81E-01	1.81E-01	1.81E-01
		% of Vehicles That Are Gasoline-Powered[6]			
		100%	99%	11%	6.7%
		Gasoline Exhaust ROG Emissions at 35 mph (g/mi)7			
	ROG	0.006	1.28E-02	2.97E-02	5.80E-01
		PM_{10}, $PM_{2.5}$ & ROG Exhaust Emissions (g/s)			
	PM_{10}	2.86E-08	4.03E-08	2.64E-07	1.62E-06
	$PM_{2.5}$	2.74E-08	3.73E-08	2.52E-07	1.55E-06
	ROG	7.40E-06	6.37E-07	1.85E-07	8.87E-06

Total distance covered by select Westward Ave. sources
170 meters

Number of Sources	**Emission Rates per source**		
	g/s	**lb/hr**	**lb/yr**
11	1.8E-07	1.4E-06	0.0124
11	1.7E-07	1.3E-06	0.0118
11	1.6E-06	1.2E-05	0.1081

Speciated Emissions Rates

		lb/yr	lb/hr
diesel part.	--	1.24E-02	1.41E-06
PM2.5	--	1.18E-02	1.35E-06
1,3-butadiene	0.0055	5.95E-04	6.78E-08
benzene	0.02636	2.85E-03	3.25E-07
ethylbenzene	0.01072	1.16E-03	1.32E-07
MEK	0.00019	2.05E-05	2.34E-09
naphthalene	0.00048	5.19E-05	5.92E-09
propylene	0.03127998	3.38E-03	3.86E-07
styrene	0.00126	1.36E-04	1.55E-08
toluene	0.05879998	6.36E-03	7.25E-07
m & p-xylene	0.03639998	3.94E-03	4.49E-07

[1] AADT from project traffic study, assume 10% of Bldgs 1, 2, 5, 7, & 10 traffic and 90% of Bldg 9 traffic use this route

[2] LDV assumed to LDA (Passenger Cars)

[3] 2 axle trucks are assumed to be MDV (Medium-Duty Truck GVW=5,574-8,500 lbs.)

[4] 3 axle trucks are assumed to be MHDT (Medium-Heavy Duty Truck GVW=14,001-33,000 lbs.)

[5] 4+ axle trucks are assumed to be HHDT (Heavy-Heavy Duty Truck GVW=33,001-60,000 lbs.)

Vehicle Exhaust Worksheet

Sunset Crossroads

Westward Ave. from Highland Home Rd. to Highland Springs Rd. to I-10 Ramps		AADT by Truck Category[1]			
		LDV[2]	2-Axle[3]	3-Axle[4]	4+-Axle[5]
		700	24	23	121
		% of Vehicles That Are Diesel-Powered[6]			
		0.2%	1%	89%	93%
Average Speed 35 mph		Diesel Exhaust PM10 & PM2.5 Emissions at 35 mph (g/mi)7			
	PM_{10}	0.0106	7.31E-03	5.03E-03	7.32E-03
	$PM_{2.5}$	0.0101	6.99E-03	4.81E-03	7.00E-03
		Diesel Exhaust PM10 & PM2.5 Emissions from TRUs (g/hr)			
	PM_{10}	N/A	1.97E-01	1.97E-01	1.97E-01
	$PM_{2.5}$	N/A	1.81E-01	1.81E-01	1.81E-01
		% of Vehicles That Are Gasoline-Powered[6]			
		100%	99%	11%	6.7%
		Gasoline Exhaust ROG Emissions at 35 mph (g/mi)7			
	ROG	0.006	1.28E-02	2.97E-02	5.80E-01
		PM_{10}, $PM_{2.5}$ & ROG Exhaust Emissions (g/s)			
	PM_{10}	2.92E-07	5.44E-07	2.02E-06	1.53E-05
	$PM_{2.5}$	2.80E-07	5.02E-07	1.93E-06	1.46E-05
	ROG	7.55E-05	5.23E-06	1.34E-06	8.20E-05

Total distance covered by select Westward Ave. sources
2,422 meters

Number of Sources	Emission Rates per source		
	g/s	lb/hr	lb/yr
144	1.3E-07	1.0E-06	0.0088
144	1.2E-07	9.6E-07	0.0084
144	1.1E-06	9.0E-06	0.0793

Speciated Emissions Rates

		lb/yr	lb/hr
diesel part.	--	8.78E-03	1.00E-06
PM2.5	--	8.37E-03	9.55E-07
1,3-butadiene	0.0055	4.36E-04	4.97E-08
benzene	0.02636	2.09E-03	2.38E-07
ethylbenzene	0.01072	8.50E-04	9.70E-08
MEK	0.00019	1.51E-05	1.72E-09
naphthalene	0.00048	3.81E-05	4.34E-09
propylene	0.03127998	2.48E-03	2.83E-07
styrene	0.00126	9.99E-05	1.14E-08
toluene	0.05879998	4.66E-03	5.32E-07
m & p-xylene	0.03639998	2.89E-03	3.29E-07

[1] AADT from project traffic study, assume 10% of Bldgs 1, 2, 5, 7, 9, & 10 traffic use this route

[2] LDV assumed to LDA (Passenger Cars)

[3] 2 axle trucks are assumed to be MDV (Medium-Duty Truck GVW=5,574-8,500 lbs.)

[4] 3 axle trucks are assumed to be MHDT (Medium-Heavy Duty Truck GVW=14,001-33,000 lbs.)

[5] 4+ axle trucks are assumed to be HHDT (Heavy-Heavy Duty Truck GVW=33,001-60,000 lbs.)

Vehicle Exhaust Worksheet

Sunset Crossroads

Lincoln Ave. from Sunset Ave. to Bldg 6 E. Drwy		AADT by Truck Category[1]			
		LDV[2]	**2-Axle[3]**	**3-Axle[4]**	**4+-Axle[5]**
		1,231	67	43	155
		% of Vehicles That Are Diesel-Powered[6]			
		0.2%	1%	89%	93%
Average Speed		**Diesel Exhaust PM10 & PM2.5 Emissions at 35 mph (g/mi)7**			
35 mph	PM_{10}	0.0106	7.31E-03	5.03E-03	7.32E-03
	$PM_{2.5}$	0.0101	6.99E-03	4.81E-03	7.00E-03
		Diesel Exhaust PM10 & PM2.5 Emissions from TRUs (g/hr)			
	PM_{10}	N/A	1.97E-01	1.97E-01	1.97E-01
	$PM_{2.5}$	N/A	1.81E-01	1.81E-01	1.81E-01
		% of Vehicles That Are Gasoline-Powered[6]			
		100%	99%	11%	6.7%
		Gasoline Exhaust ROG Emissions at 35 mph (g/mi)7			
	ROG	0.006	1.28E-02	2.97E-02	5.80E-01
		PM_{10}, $PM_{2.5}$ & ROG Exhaust Emissions (g/s)			
	PM_{10}	2.54E-08	2.44E-07	2.67E-07	1.34E-06
	$PM_{2.5}$	2.43E-08	2.25E-07	2.52E-07	1.27E-06
	ROG	6.57E-06	7.26E-07	1.24E-07	5.21E-06

Total distance covered by select Lincoln Ave. sources
120 meters

Number of Sources	**Emission Rates per source**		
	g/s	**lb/hr**	**lb/yr**
12	1.6E-07	1.2E-06	0.0109
12	1.5E-07	1.2E-06	0.0103
12	1.1E-06	8.4E-06	0.0733

[1] AADT from project traffic study, assume 50% of Bldgs 5 & 6 traffic and all of Bldg 8 traffic use this route

[2] LDV assumed to LDA (Passenger Cars)

[3] 2 axle trucks are assumed to be MDV (Medium-Duty Truck GVW=5,574-8,500 lbs.)

[4] 3 axle trucks are assumed to be MHDT (Medium-Heavy Duty Truck GVW=14,001-33,000 lbs.)

[5] 4+ axle trucks are assumed to be HHDT (Heavy-Heavy Duty Truck GVW=33,001-60,000 lbs.)

Speciated Emissions Rates

		lb/yr	lb/hr
diesel part.	--	1.09E-02	1.24E-06
PM2.5	--	1.03E-02	1.17E-06
1,3-butadiene	0.0055	4.03E-04	4.60E-08
benzene	0.02636	1.93E-03	2.20E-07
ethylbenzene	0.01072	7.85E-04	8.96E-08
MEK	0.00019	1.39E-05	1.59E-09
naphthalene	0.00048	3.52E-05	4.01E-09
propylene	0.03127998	2.29E-03	2.61E-07
styrene	0.00126	9.23E-05	1.05E-08
toluene	0.05879998	4.31E-03	4.91E-07
m & p-xylene	0.03639998	2.67E-03	3.04E-07

Vehicle Exhaust Worksheet

Sunset Crossroads

Lincoln Ave. from Bldg 6 E. Drwy to Bldg 6 W. Drwy		AADT by Truck Category[1]			
		LDV[2]	2-Axle[3]	3-Axle[4]	4+-Axle[5]
		1,103	42	31	106
		% of Vehicles That Are Diesel-Powered[6]			
		0.2%	1%	89%	93%
Average Speed		Diesel Exhaust PM10 & PM2.5 Emissions at 35 mph (g/mi)7			
35 mph	PM_{10}	0.0106	7.31E-03	5.03E-03	7.32E-03
	$PM_{2.5}$	0.0101	6.99E-03	4.81E-03	7.00E-03
		Diesel Exhaust PM10 & PM2.5 Emissions from TRUs (g/hr)			
	PM_{10}	N/A	1.97E-01	1.97E-01	1.97E-01
	$PM_{2.5}$	N/A	1.81E-01	1.81E-01	1.81E-01
		% of Vehicles That Are Gasoline-Powered[6]			
		100%	99%	11%	6.7%
		Gasoline Exhaust ROG Emissions at 35 mph (g/mi)7			
	ROG	0.006	1.28E-02	2.97E-02	5.80E-01
		PM_{10}, $PM_{2.5}$ & ROG Exhaust Emissions (g/s)			
	PM_{10}	4.56E-08	2.35E-07	3.26E-07	1.62E-06
	$PM_{2.5}$	4.36E-08	2.17E-07	3.09E-07	1.54E-06
	ROG	1.18E-05	8.99E-07	1.79E-07	7.09E-06

Total distance covered by select Lincoln Ave. sources
240 meters

Number of Sources	Emission Rates per source		
	g/s	lb/hr	lb/yr
19	1.2E-07	9.3E-07	0.0082
19	1.1E-07	8.8E-07	0.0077
19	1.1E-06	8.3E-06	0.0731

Speciated Emissions Rates

		lb/yr	lb/hr
diesel part.	--	8.17E-03	9.32E-07
PM2.5	--	7.72E-03	8.81E-07
1,3-butadiene	0.0055	4.02E-04	4.58E-08
benzene	0.02636	1.93E-03	2.20E-07
ethylbenzene	0.01072	7.83E-04	8.94E-08
MEK	0.00019	1.39E-05	1.58E-09
naphthalene	0.00048	3.51E-05	4.00E-09
propylene	0.03127998	2.29E-03	2.61E-07
styrene	0.00126	9.21E-05	1.05E-08
toluene	0.05879998	4.30E-03	4.90E-07
m & p-xylene	0.03639998	2.66E-03	3.03E-07

[1] AADT from project traffic study, assume 50% of Bldg 6 traffic and all of Bldg 8 traffic use this route

[2] LDV assumed to LDA (Passenger Cars)

[3] 2 axle trucks are assumed to be MDV (Medium-Duty Truck GVW=5,574-8,500 lbs.)

[4] 3 axle trucks are assumed to be MHDT (Medium-Heavy Duty Truck GVW=14,001-33,000 lbs.)

[5] 4+ axle trucks are assumed to be HHDT (Heavy-Heavy Duty Truck GVW=33,001-60,000 lbs.)

Vehicle Exhaust Worksheet

Sunset Crossroads

Lincoln Ave. from Bldg 6 W. Drwy to Bldg 8 E. Drwy		AADT by Truck Category[1]			
		LDV[2]	**2-Axle[3]**	**3-Axle[4]**	**4+-Axle[5]**
		948	18	22	66
		% of Vehicles That Are Diesel-Powered[6]			
		0.2%	1%	89%	93%
Average Speed		**Diesel Exhaust PM10 & PM2.5 Emissions at 35 mph (g/mi)[7]**			
35 mph	PM_{10}	0.0106	7.31E-03	5.03E-03	7.32E-03
	$PM_{2.5}$	0.0101	6.99E-03	4.81E-03	7.00E-03
		% of Vehicles That Are Gasoline-Powered[6]			
		100%	99%	11%	6.7%
		Gasoline Exhaust ROG Emissions at 35 mph (g/mi)[7]			
	ROG	0.006	1.28E-02	2.97E-02	5.80E-01
		PM_{10}, $PM_{2.5}$ & ROG Exhaust Emissions (g/s)			
	PM_{10}	7.84E-08	6.49E-09	3.39E-07	1.55E-06
	$PM_{2.5}$	7.50E-08	6.21E-09	3.24E-07	1.49E-06
	ROG	2.03E-05	7.80E-07	2.53E-07	8.88E-06

Total distance covered by select Lincoln Ave. sources
479 meters

Number of Sources	**Emission Rates per source**		
	g/s	**lb/hr**	**lb/yr**
37	5.3E-08	4.2E-07	0.0037
37	5.1E-08	4.1E-07	0.0036
37	8.2E-07	6.5E-06	0.0567

Speciated Emissions Rates

		lb/yr	lb/hr
diesel part.	--	3.72E-03	4.24E-07
PM2.5	--	3.56E-03	4.06E-07
1,3-butadiene	0.0055	3.12E-04	3.56E-08
benzene	0.02636	1.49E-03	1.71E-07
ethylbenzene	0.01072	6.08E-04	6.94E-08
MEK	0.00019	1.08E-05	1.23E-09
naphthalene	0.00048	2.72E-05	3.11E-09
propylene	0.03127998	1.77E-03	2.02E-07
styrene	0.00126	7.15E-05	8.15E-09
toluene	0.05879998	3.33E-03	3.80E-07
m & p-xylene	0.03639998	2.06E-03	2.35E-07

[1] AADT from project traffic study, assume just Bldg 8 traffic use this route

[2] LDV assumed to LDA (Passenger Cars)

[3] 2 axle trucks are assumed to be MDV (Medium-Duty Truck GVW=5,574-8,500 lbs.)

[4] 3 axle trucks are assumed to be MHDT (Medium-Heavy Duty Truck GVW=14,001-33,000 lbs.)

[5] 4+ axle trucks are assumed to be HHDT (Heavy-Heavy Duty Truck GVW=33,001-60,000 lbs.)

[6] Source: EMFAC2021 VMT data

[7] Source: EMFAC2021 emission factors for 2027 (model year aggregate).

Vehicle Exhaust Worksheet

Sunset Crossroads

Lincoln Ave. from Bldg 8 E. Drwy to Bldg 8 W. Drwy		AADT by Truck Category[1]			
		LDV[2]	**2-Axle[3]**	**3-Axle[4]**	**4+-Axle[5]**
		474	9	11	33
		% of Vehicles That Are Diesel-Powered[6]			
		0.2%	1%	89%	93%
Average Speed		**Diesel Exhaust PM10 & PM2.5 Emissions at 35 mph (g/mi)[7]**			
35 mph	PM_{10}	0.0106	7.31E-03	5.03E-03	7.32E-03
	$PM_{2.5}$	0.0101	6.99E-03	4.81E-03	7.00E-03
		% of Vehicles That Are Gasoline-Powered[6]			
		100%	99%	11%	6.7%
		Gasoline Exhaust ROG Emissions at 35 mph (g/mi)[7]			
	ROG	0.006	1.28E-02	2.97E-02	5.80E-01
		PM_{10}, $PM_{2.5}$ & ROG Exhaust Emissions (g/s)			
	PM_{10}	2.07E-08	1.71E-09	8.93E-08	4.10E-07
	$PM_{2.5}$	1.98E-08	1.64E-09	8.55E-08	3.92E-07
	ROG	5.34E-06	2.06E-07	6.69E-08	2.34E-06

Total distance covered by select Lincoln Ave. sources
253 meters

Number of Sources	**Emission Rates per source**		
	g/s	**lb/hr**	**lb/yr**
20	2.6E-08	2.1E-07	0.0018
20	2.5E-08	2.0E-07	0.0017
20	4.0E-07	3.2E-06	0.0277

Speciated Emissions Rates

		lb/yr	lb/hr
diesel part.	--	1.81E-03	2.07E-07
PM2.5	--	1.74E-03	1.98E-07
1,3-butadiene	0.0055	1.52E-04	1.74E-08
benzene	0.02636	7.30E-04	8.33E-08
ethylbenzene	0.01072	2.97E-04	3.39E-08
MEK	0.00019	5.26E-06	6.00E-10
naphthalene	0.00048	1.33E-05	1.52E-09
propylene	0.03127998	8.66E-04	9.88E-08
styrene	0.00126	3.49E-05	3.98E-09
toluene	0.05879998	1.63E-03	1.86E-07
m & p-xylene	0.03639998	1.01E-03	1.15E-07

[1] AADT from project traffic study, assume 50% of Bldg 8 traffic use this route

[2] LDV assumed to LDA (Passenger Cars)

[3] 2 axle trucks are assumed to be MDV (Medium-Duty Truck GVW=5,574-8,500 lbs.)

[4] 3 axle trucks are assumed to be MHDT (Medium-Heavy Duty Truck GVW=14,001-33,000 lbs.)

[5] 4+ axle trucks are assumed to be HHDT (Heavy-Heavy Duty Truck GVW=33,001-60,000 lbs.)

[6] Source: EMFAC2021 VMT data

[7] Source: EMFAC2021 emission factors for 2027 (model year aggregate).

Vehicle Exhaust Worksheet

Sunset Crossroads

Highland Home Ave. from Bldg 9 Drwy to Westward Ave.		AADT by Truck Category[1]			
		LDV[2]	**2-Axle[3]**	**3-Axle[4]**	**4+-Axle[5]**
		348	22	28	82
		% of Vehicles That Are Diesel-Powered[6]			
		0.2%	1%	89%	93%
Average Speed		**Diesel Exhaust PM10 & PM2.5 Emissions at 35 mph (g/mi)[7]**			
35 mph	PM_{10}	0.0106	7.31E-03	5.03E-03	7.32E-03
	$PM_{2.5}$	0.0101	6.99E-03	4.81E-03	7.00E-03
		% of Vehicles That Are Gasoline-Powered[6]			
		100%	99%	11%	6.7%
		Gasoline Exhaust ROG Emissions at 35 mph (g/mi)[7]			
	ROG	0.006	1.28E-02	2.97E-02	5.80E-01
		PM_{10}, $PM_{2.5}$ & ROG Exhaust Emissions (g/s)			
	PM_{10}	3.36E-08	9.26E-09	5.03E-07	2.25E-06
	$PM_{2.5}$	3.21E-08	8.86E-09	4.81E-07	2.15E-06
	ROG	8.67E-06	1.11E-06	3.76E-07	1.29E-05

Total distance covered by Highland Home Ave. sources
559 meters

Number of Sources	**Emission Rates per source**		
	g/s	**lb/hr**	**lb/yr**
43	6.5E-08	5.2E-07	0.0045
43	6.2E-08	4.9E-07	0.0043
43	5.4E-07	4.3E-06	0.0373

Speciated Emissions Rates

		lb/yr	lb/hr
diesel part.	--	4.52E-03	5.16E-07
PM2.5	--	4.33E-03	4.94E-07
1,3-butadiene	0.0055	2.05E-04	2.34E-08
benzene	0.02636	9.82E-04	1.12E-07
ethylbenzene	0.01072	3.99E-04	4.56E-08
MEK	0.00019	7.08E-06	8.08E-10
naphthalene	0.00048	1.79E-05	2.04E-09
propylene	0.03127998	1.17E-03	1.33E-07
styrene	0.00126	4.69E-05	5.36E-09
toluene	0.05879998	2.19E-03	2.50E-07
m & p-xylene	0.03639998	1.36E-03	1.55E-07

[1] AADT from project traffic study, assume just Bldg 9 traffic use this route

[2] LDV assumed to LDA (Passenger Cars)

[3] 2 axle trucks are assumed to be MDV (Medium-Duty Truck GVW=5,574-8,500 lbs.)

[4] 3 axle trucks are assumed to be MHDT (Medium-Heavy Duty Truck GVW=14,001-33,000 lbs.)

[5] 4+ axle trucks are assumed to be HHDT (Heavy-Heavy Duty Truck GVW=33,001-60,000 lbs.)

[6] Source: EMFAC2021 VMT data

[7] Source: EMFAC2021 emission factors for 2027 (model year aggregate).

Vehicle Exhaust Worksheet

Sunset Crossroads

I-10 EB OffRamp onto Sunset Ave.		AADT by Truck Category[1]			
		LDV[2]	**2-Axle[3]**	**3-Axle[4]**	**4+-Axle[5]**
		4,834	172	152	784
		% of Vehicles That Are Diesel-Powered[6]			
		0.2%	1%	89%	93%
Average Speed 35 mph		**Diesel Exhaust PM10 & PM2.5 Emissions at 35 mph (g/mi)7**			
	PM_{10}	0.0106	7.31E-03	5.03E-03	7.32E-03
	$PM_{2.5}$	0.0101	6.99E-03	4.81E-03	7.00E-03
		Diesel Exhaust PM10 & PM2.5 Emissions from TRUs (g/hr)			
	PM_{10}	N/A	1.97E-01	1.97E-01	1.97E-01
	$PM_{2.5}$	N/A	1.81E-01	1.81E-01	1.81E-01
		% of Vehicles That Are Gasoline-Powered[6]			
		100%	99%	11%	6.7%
		Gasoline Exhaust ROG Emissions at 35 mph (g/mi)7			
	ROG	0.006	1.28E-02	2.97E-02	5.80E-01
		PM_{10}, $PM_{2.5}$ & ROG Exhaust Emissions (g/s)			
	PM_{10}	3.66E-07	1.02E-06	2.56E-06	1.87E-05
	$PM_{2.5}$	3.50E-07	9.37E-07	2.43E-06	1.78E-05
	ROG	9.47E-05	6.83E-06	1.61E-06	9.67E-05

Total distance covered by I-10EB Sunset Ave. offramp sources
439 meters

Number of Sources	**Emission Rates per source**		
	g/s	**lb/hr**	**lb/yr**
34	6.6E-07	5.3E-06	0.0462
34	6.3E-07	5.0E-06	0.0440
34	5.9E-06	4.7E-05	0.4089

Speciated Emissions Rates

		lb/yr	lb/hr
diesel part.	--	4.62E-02	5.28E-06
PM2.5	--	4.40E-02	5.02E-06
1,3-butadiene	0.0055	2.25E-03	2.57E-07
benzene	0.02636	1.08E-02	1.23E-06
ethylbenzene	0.01072	4.38E-03	5.00E-07
MEK	0.00019	7.77E-05	8.86E-09
naphthalene	0.00048	1.96E-04	2.24E-08
propylene	0.03127998	1.28E-02	1.46E-06
styrene	0.00126	5.15E-04	5.88E-08
toluene	0.05879998	2.40E-02	2.74E-06
m & p-xylene	0.03639998	1.49E-02	1.70E-06

[1] AADT from project traffic study, assume 49.5% of Bldgs 1, 2, 7, 9, & 10 traffic, 55% of Bldgs 3, 4, 5, 6, & 8 traffic use this route

[2] LDV assumed to LDA (Passenger Cars)

[3] 2 axle trucks are assumed to be MDV (Medium-Duty Truck GVW=5,574-8,500 lbs.)

[4] 3 axle trucks are assumed to be MHDT (Medium-Heavy Duty Truck GVW=14,001-33,000 lbs.)

[5] 4+ axle trucks are assumed to be HHDT (Heavy-Heavy Duty Truck GVW=33,001-60,000 lbs.)

Vehicle Exhaust Worksheet

Sunset Crossroads

I-10 EB OnRamp from Sunset Ave.		AADT by Truck Category[1]			
		LDV[2]	**2-Axle[3]**	**3-Axle[4]**	**4+-Axle[5]**
		4,834	172	152	784
		% of Vehicles That Are Diesel-Powered[6]			
		0.2%	1%	89%	93%
Average Speed		**Diesel Exhaust PM10 & PM2.5 Emissions at 35 mph (g/mi)7**			
35 mph	PM_{10}	0.0106	7.31E-03	5.03E-03	7.32E-03
	$PM_{2.5}$	0.0101	6.99E-03	4.81E-03	7.00E-03
		Diesel Exhaust PM10 & PM2.5 Emissions from TRUs (g/hr)			
	PM_{10}	N/A	1.97E-01	1.97E-01	1.97E-01
	$PM_{2.5}$	N/A	1.81E-01	1.81E-01	1.81E-01
		% of Vehicles That Are Gasoline-Powered[6]			
		100%	99%	11%	6.7%
		Gasoline Exhaust ROG Emissions at 35 mph (g/mi)7			
	ROG	0.006	1.28E-02	2.97E-02	5.80E-01
		PM_{10}, $PM_{2.5}$ & ROG Exhaust Emissions (g/s)			
	PM_{10}	4.43E-07	1.23E-06	3.09E-06	2.26E-05
	$PM_{2.5}$	4.24E-07	1.13E-06	2.94E-06	2.15E-05
	ROG	1.14E-04	8.26E-06	1.94E-06	1.17E-04

Total distance covered by I-10EB Sunset Ave. onramp sources
531 meters

Number of Sources	**Emission Rates per source**		
	g/s	**lb/hr**	**lb/yr**
56	4.9E-07	3.9E-06	0.0339
56	4.6E-07	3.7E-06	0.0323
56	4.3E-06	3.4E-05	0.3001

Speciated Emissions Rates

		lb/yr	lb/hr
diesel part.	--	3.39E-02	3.87E-06
PM2.5	--	3.23E-02	3.69E-06
1,3-butadiene	0.0055	1.65E-03	1.88E-07
benzene	0.02636	7.91E-03	9.02E-07
ethylbenzene	0.01072	3.22E-03	3.67E-07
MEK	0.00019	5.70E-05	6.50E-09
naphthalene	0.00048	1.44E-04	1.64E-08
propylene	0.03127998	9.39E-03	1.07E-06
styrene	0.00126	3.78E-04	4.31E-08
toluene	0.05879998	1.76E-02	2.01E-06
m & p-xylene	0.03639998	1.09E-02	1.25E-06

[1] AADT from project traffic study, assume 49.5% of Bldgs 1, 2, 7, 9, & 10 traffic, 55% of Bldgs 3, 4, 5, 6, & 8 traffic use this route

[2] LDV assumed to LDA (Passenger Cars)

[3] 2 axle trucks are assumed to be MDV (Medium-Duty Truck GVW=5,574-8,500 lbs.)

[4] 3 axle trucks are assumed to be MHDT (Medium-Heavy Duty Truck GVW=14,001-33,000 lbs.)

[5] 4+ axle trucks are assumed to be HHDT (Heavy-Heavy Duty Truck GVW=33,001-60,000 lbs.)

Vehicle Exhaust Worksheet

Sunset Crossroads

I-10 WB OffRamp onto Sunset Ave.		AADT by Truck Category[1]			
		LDV[2]	**2-Axle[3]**	**3-Axle[4]**	**4+-Axle[5]**
		4,834	172	152	784
		% of Vehicles That Are Diesel-Powered[6]			
		0.2%	1%	89%	93%
Average Speed 35 mph		**Diesel Exhaust PM10 & PM2.5 Emissions at 35 mph (g/mi)7**			
	PM_{10}	0.0106	7.31E-03	5.03E-03	7.32E-03
	$PM_{2.5}$	0.0101	6.99E-03	4.81E-03	7.00E-03
		Diesel Exhaust PM10 & PM2.5 Emissions from TRUs (g/hr)			
	PM_{10}	N/A	1.97E-01	1.97E-01	1.97E-01
	$PM_{2.5}$	N/A	1.81E-01	1.81E-01	1.81E-01
		% of Vehicles That Are Gasoline-Powered[6]			
		100%	99%	11%	6.7%
		Gasoline Exhaust ROG Emissions at 35 mph (g/mi)7			
	ROG	0.006	1.28E-02	2.97E-02	5.80E-01
		PM_{10}, $PM_{2.5}$ & ROG Exhaust Emissions (g/s)			
	PM_{10}	3.88E-07	1.08E-06	2.71E-06	1.98E-05
	$PM_{2.5}$	3.72E-07	9.94E-07	2.58E-06	1.89E-05
	ROG	1.00E-04	7.25E-06	1.71E-06	1.03E-04

Total distance covered by I-10WB Sunset Ave. offramp sources
466 meters

Number of Sources	**Emission Rates per source**		
	g/s	**lb/hr**	**lb/yr**
36	6.7E-07	5.3E-06	0.0463
36	6.3E-07	5.0E-06	0.0441
36	5.9E-06	4.7E-05	0.4095

Speciated Emissions Rates

		lb/yr	lb/hr
diesel part.	--	4.63E-02	5.28E-06
PM2.5	--	4.41E-02	5.03E-06
1,3-butadiene	0.0055	2.25E-03	2.57E-07
benzene	0.02636	1.08E-02	1.23E-06
ethylbenzene	0.01072	4.39E-03	5.01E-07
MEK	0.00019	7.78E-05	8.88E-09
naphthalene	0.00048	1.97E-04	2.24E-08
propylene	0.03127998	1.28E-02	1.46E-06
styrene	0.00126	5.16E-04	5.89E-08
toluene	0.05879998	2.41E-02	2.75E-06
m & p-xylene	0.03639998	1.49E-02	1.70E-06

[1] AADT from project traffic study, assume 49.5% of Bldgs 1, 2, 7, 9, & 10 traffic, 55% of Bldgs 3, 4, 5, 6, & 8 traffic use this route

[2] LDV assumed to LDA (Passenger Cars)

[3] 2 axle trucks are assumed to be MDV (Medium-Duty Truck GVW=5,574-8,500 lbs.)

[4] 3 axle trucks are assumed to be MHDT (Medium-Heavy Duty Truck GVW=14,001-33,000 lbs.)

[5] 4+ axle trucks are assumed to be HHDT (Heavy-Heavy Duty Truck GVW=33,001-60,000 lbs.)

Vehicle Exhaust Worksheet

Sunset Crossroads

I-10 WB OnRamp from Sunset Ave.		AADT by Truck Category[1]			
		LDV[2]	**2-Axle[3]**	**3-Axle[4]**	**4+-Axle[5]**
		4,834	172	152	784
		% of Vehicles That Are Diesel-Powered[6]			
		0.2%	1%	89%	93%
Average Speed		**Diesel Exhaust PM10 & PM2.5 Emissions at 35 mph (g/mi)7**			
35 mph	PM_{10}	0.0106	7.31E-03	5.03E-03	7.32E-03
	$PM_{2.5}$	0.0101	6.99E-03	4.81E-03	7.00E-03
		Diesel Exhaust PM10 & PM2.5 Emissions from TRUs (g/hr)			
	PM_{10}	N/A	1.97E-01	1.97E-01	1.97E-01
	$PM_{2.5}$	N/A	1.81E-01	1.81E-01	1.81E-01
		% of Vehicles That Are Gasoline-Powered[6]			
		100%	99%	11%	6.7%
		Gasoline Exhaust ROG Emissions at 35 mph (g/mi)7			
	ROG	0.006	1.28E-02	2.97E-02	5.80E-01
		PM_{10}, $PM_{2.5}$ & ROG Exhaust Emissions (g/s)			
	PM_{10}	3.44E-07	9.54E-07	2.40E-06	1.75E-05
	$PM_{2.5}$	3.29E-07	8.80E-07	2.29E-06	1.67E-05
	ROG	8.89E-05	6.42E-06	1.51E-06	9.08E-05

Total distance covered by I-10WB Sunset Ave. onramp sources
413 meters

Number of Sources	**Emission Rates per source**		
	g/s	**lb/hr**	**lb/yr**
32	6.6E-07	5.3E-06	0.0462
32	6.3E-07	5.0E-06	0.0439
32	5.9E-06	4.7E-05	0.4081

Speciated Emissions Rates

		lb/yr	lb/hr
diesel part.	--	4.62E-02	5.27E-06
PM2.5	--	4.39E-02	5.01E-06
1,3-butadiene	0.0055	2.24E-03	2.56E-07
benzene	0.02636	1.08E-02	1.23E-06
ethylbenzene	0.01072	4.37E-03	4.99E-07
MEK	0.00019	7.75E-05	8.85E-09
naphthalene	0.00048	1.96E-04	2.23E-08
propylene	0.03127998	1.28E-02	1.46E-06
styrene	0.00126	5.14E-04	5.87E-08
toluene	0.05879998	2.40E-02	2.74E-06
m & p-xylene	0.03639998	1.49E-02	1.69E-06

[1] AADT from project traffic study, assume 49.5% of Bldgs 1, 2, 7, 9, & 10 traffic, 55% of Bldgs 3, 4, 5, 6, & 8 traffic use this route

[2] LDV assumed to LDA (Passenger Cars)

[3] 2 axle trucks are assumed to be MDV (Medium-Duty Truck GVW=5,574-8,500 lbs.)

[4] 3 axle trucks are assumed to be MHDT (Medium-Heavy Duty Truck GVW=14,001-33,000 lbs.)

[5] 4+ axle trucks are assumed to be HHDT (Heavy-Heavy Duty Truck GVW=33,001-60,000 lbs.)

Vehicle Exhaust Worksheet

Sunset Crossroads

I-10 WB OnRamp from Highland Springs Ave.		AADT by Truck Category[1]			
		LDV[2]	**2-Axle[3]**	**3-Axle[4]**	**4+-Axle[5]**
		700	24	23	121
		% of Vehicles That Are Diesel-Powered[6]			
		0.2%	1%	89%	93%
Average Speed		**Diesel Exhaust PM10 & PM2.5 Emissions at 35 mph (g/mi)7**			
35 mph	PM_{10}	0.0106	7.31E-03	5.03E-03	7.32E-03
	$PM_{2.5}$	0.0101	6.99E-03	4.81E-03	7.00E-03
		Diesel Exhaust PM10 & PM2.5 Emissions from TRUs (g/hr)			
	PM_{10}	N/A	1.97E-01	1.97E-01	1.97E-01
	$PM_{2.5}$	N/A	1.81E-01	1.81E-01	1.81E-01
		% of Vehicles That Are Gasoline-Powered[6]			
		100%	99%	11%	6.7%
		Gasoline Exhaust ROG Emissions at 35 mph (g/mi)7			
	ROG	0.006	1.28E-02	2.97E-02	5.80E-01
		PM_{10}, $PM_{2.5}$ & ROG Exhaust Emissions (g/s)			
	PM_{10}	2.87E-08	5.33E-08	1.99E-07	1.50E-06
	$PM_{2.5}$	2.74E-08	4.93E-08	1.89E-07	1.43E-06
	ROG	7.41E-06	5.13E-07	1.31E-07	8.05E-06

Total distance covered by I-10WB Highland Springs onramp sources
238 meters

Number of Sources	**Emission Rates per source**		
	g/s	**lb/hr**	**lb/yr**
15	1.2E-07	9.4E-07	0.0083
15	1.1E-07	9.0E-07	0.0079
15	1.1E-06	8.5E-06	0.0747

Speciated Emissions Rates

		lb/yr	lb/hr
diesel part.	--	8.27E-03	9.44E-07
PM2.5	--	7.89E-03	9.00E-07
1,3-butadiene	0.0055	4.11E-04	4.69E-08
benzene	0.02636	1.97E-03	2.25E-07
ethylbenzene	0.01072	8.01E-04	9.13E-08
MEK	0.00019	1.42E-05	1.62E-09
naphthalene	0.00048	3.59E-05	4.09E-09
propylene	0.03127998	2.34E-03	2.67E-07
styrene	0.00126	9.41E-05	1.07E-08
toluene	0.05879998	4.39E-03	5.01E-07
m & p-xylene	0.03639998	2.72E-03	3.10E-07

[1] AADT from project traffic study, assume 10% of Bldgs 1, 2, 5, 7, 9, & 10 traffic use this route

[2] LDV assumed to LDA (Passenger Cars)

[3] 2 axle trucks are assumed to be MDV (Medium-Duty Truck GVW=5,574-8,500 lbs.)

[4] 3 axle trucks are assumed to be MHDT (Medium-Heavy Duty Truck GVW=14,001-33,000 lbs.)

[5] 4+ axle trucks are assumed to be HHDT (Heavy-Heavy Duty Truck GVW=33,001-60,000 lbs.)

Vehicle Exhaust Worksheet

Sunset Crossroads

I-10 EB OffRamp onto Highland Springs Ave.		AADT by Truck Category[1]			
		LDV[2]	**2-Axle[3]**	**3-Axle[4]**	**4+-Axle[5]**
		700	24	23	121
		% of Vehicles That Are Diesel-Powered[6]			
		0.2%	1%	89%	93%
Average Speed		**Diesel Exhaust PM10 & PM2.5 Emissions at 35 mph (g/mi)7**			
35 mph	PM_{10}	0.0106	7.31E-03	5.03E-03	7.32E-03
	$PM_{2.5}$	0.0101	6.99E-03	4.81E-03	7.00E-03
		Diesel Exhaust PM10 & PM2.5 Emissions from TRUs (g/hr)			
	PM_{10}	N/A	1.97E-01	1.97E-01	1.97E-01
	$PM_{2.5}$	N/A	1.81E-01	1.81E-01	1.81E-01
		% of Vehicles That Are Gasoline-Powered[6]			
		100%	99%	11%	6.7%
		Gasoline Exhaust ROG Emissions at 35 mph (g/mi)7			
	ROG	0.006	1.28E-02	2.97E-02	5.80E-01
		PM_{10}, $PM_{2.5}$ & ROG Exhaust Emissions (g/s)			
	PM_{10}	3.05E-08	5.68E-08	2.11E-07	1.60E-06
	$PM_{2.5}$	2.92E-08	5.24E-08	2.01E-07	1.53E-06
	ROG	7.89E-06	5.47E-07	1.40E-07	8.57E-06

Total distance covered by I-10WB Highland Springs offramp sources
253 meters

Number of Sources	**Emission Rates per source**		
	g/s	**lb/hr**	**lb/yr**
20	9.5E-08	7.5E-07	0.0066
20	9.1E-08	7.2E-07	0.0063
20	8.6E-07	6.8E-06	0.0596

Speciated Emissions Rates

		lb/yr	lb/hr
diesel part.	--	6.61E-03	7.54E-07
PM2.5	--	6.30E-03	7.18E-07
1,3-butadiene	0.0055	3.28E-04	3.74E-08
benzene	0.02636	1.57E-03	1.79E-07
ethylbenzene	0.01072	6.39E-04	7.29E-08
MEK	0.00019	1.13E-05	1.29E-09
naphthalene	0.00048	2.86E-05	3.27E-09
propylene	0.03127998	1.87E-03	2.13E-07
styrene	0.00126	7.51E-05	8.57E-09
toluene	0.05879998	3.51E-03	4.00E-07
m & p-xylene	0.03639998	2.17E-03	2.48E-07

[1] AADT from project traffic study, assume 10% of Bldgs 1, 2, 5, 7, 9, & 10 traffic use this route

[2] LDV assumed to LDA (Passenger Cars)

[3] 2 axle trucks are assumed to be MDV (Medium-Duty Truck GVW=5,574-8,500 lbs.)

[4] 3 axle trucks are assumed to be MHDT (Medium-Heavy Duty Truck GVW=14,001-33,000 lbs.)

[5] 4+ axle trucks are assumed to be HHDT (Heavy-Heavy Duty Truck GVW=33,001-60,000 lbs.)

Gas Station Worksheet

Sunset Crossroads

Table X-1. Gasoline Emission Factors for Retail Service Stations Process

		Loading	Breathing	Refueling	Hose Permeation	Spillage
Controlled Gasoline EF (lbs/1,000 gal)		0.15	0.024	0.32	0.009	0.24
Benzene	**Weight Percent**	0.455%	0.455%	0.455%	0.455%	0.707%
	Emission Factor (lbs/1,000 gal)	6.83E-04	1.09E-04	1.46E-03	4.10E-05	1.70E-03
Ethylbenzene	**Weight Percent**	0.107%	0.107%	0.107%	0.107%	1.29%
	Emission Factor (lbs/1,000 gal)	1.61E-04	2.57E-05	3.42E-04	9.63E-06	3.10E-03
Naphthalene	**Weight Percent**	0.0004%	0.0004%	0.0004%	0.0004%	0.174%
	Emission Factor (lbs/1,000 gal)	6.00E-07	9.60E-08	1.28E-06	3.60E-08	4.18E-04

Source: SCAQMD RISK ASSESSMENT PROCEDURES for Rules 1401, 1401.1 and 212, Version 8.1, September 1, 2017

Note: *The weight percentages of the TACs evaluated for cancer risk are based on a weighted summer (214 days per year) and winter (151 days per year) gasoline speciation.

*Gasoline speciation profile: https://www.arb.ca.gov/ei/speciate/refspec.htm

Project expects:	250,000	gallons/month
Assume:	12	months/year
Assume:	24	hours/day

Number of auto pumps	10	(20 fueling positions)
Number of truck pumps	7	(6 fueling positions)

Underground Storage Tanks: Centrally positioned so only one pit has to be dug. Would allocate space for four 20K gallon tanks. Two would be for the auto canopy and two would be for the truck canopy. Assume for the autos the break down would be one 20K split tank (15K regular, 5K E85) and one 20K split tank (8K Diesel, 12K Premium). For the trucks, both tanks would be 20K split tanks (15K Diesel, 5K DEF).

Truck parking:	31	Dedicated stalls
Auto parking:	28	Stalls

Drive Thru: Stacking space for 10 cars from pick-up window. City code requires six car stacking from menu board.

Trash Enclosure: Space for two 8-yard containers.

				lb/yr	lb/hr
	UGTNKV	POINT	benzene	1.08E-02	1.23E-06
Underground Tank Vent	UGTNKV	POINT	Ethylbenzene	5.99E-04	6.84E-08
	UGTNKV	POINT	Naphthalene	8.35E-09	9.53E-13
	GSTNRF	VOLUME	benzene	1.99E-02	2.28E-06
Gas Station refueling	GSTNRF	VOLUME	Ethylbenzene	1.10E-03	1.25E-07
	GSTNRF	VOLUME	Naphthalene	1.54E-08	1.75E-12
	GSTNSP	VOLUME	benzene	3.66E-02	4.18E-06
Gas Station spillage	GSTNSP	VOLUME	Ethylbenzene	1.20E-01	1.37E-05
	GSTNSP	VOLUME	Naphthalene	2.18E-03	2.49E-07

EMFAC2021 VMT Data

Source: EMFAC2021 (v1.0.2) Emissions Inventory
Region Type: Sub-Area
Region: Riverside (SC)
Calendar Year: 2027
Season: Annual
Vehicle Classification: EMFAC2007 Categories

Region	Calendar Year	Vehicle Category	Model Year	Speed	Fuel	Population	Fleet %
Riverside (SC)	2027	LDA	Aggregate	Aggregate	Gasoline	471,235.7	90.8%
Riverside (SC)	2027	LDA	Aggregate	Aggregate	Diesel	1,176.5	0.2%
Riverside (SC)	2027	LDA	Aggregate	Aggregate	Electricity	30,348.9	5.8%
Riverside (SC)	2027	LDA	Aggregate	Aggregate	Plug-in Hybrid	16,056.7	3.1%
Riverside (SC)	2027	MDV	Aggregate	Aggregate	Gasoline	157,494.1	95.8%
Riverside (SC)	2027	MDV	Aggregate	Aggregate	Diesel	2,354.8	1.4%
Riverside (SC)	2027	MDV	Aggregate	Aggregate	Electricity	2,779.4	1.7%
Riverside (SC)	2027	MDV	Aggregate	Aggregate	Plug-in Hybrid	1,757.4	1.1%
Riverside (SC)	2027	MHDT	Aggregate	Aggregate	Gasoline	1,187.0	7.6%
Riverside (SC)	2027	MHDT	Aggregate	Aggregate	Diesel	13,823.9	88.8%
Riverside (SC)	2027	MHDT	Aggregate	Aggregate	Electricity	371.8	2.4%
Riverside (SC)	2027	MHDT	Aggregate	Aggregate	Natural Gas	191.2	1.2%
Riverside (SC)	2027	HHDT	Aggregate	Aggregate	Gasoline	4.4	0.03%
Riverside (SC)	2027	HHDT	Aggregate	Aggregate	Diesel	16,021.1	93.3%
Riverside (SC)	2027	HHDT	Aggregate	Aggregate	Electricity	291.1	1.7%
Riverside (SC)	2027	HHDT	Aggregate	Aggregate	Natural Gas	859.7	5.0%

calendar year	season month	sub area	vehicle class	fuel	process	speed time	pollutant	emission rate
2027	Annual	Riverside (SC)	MHDT	Dsl	IDLEX		PM10	0.0383
2027	Annual	Riverside (SC)	MHDT	Dsl	IDLEX		PM2_5	0.0367
2027	Annual	Riverside (SC)	HHDT	Dsl	IDLEX		PM10	0.0122
2027	Annual	Riverside (SC)	HHDT	Dsl	IDLEX		PM2_5	0.0116
2027	Annual	Riverside (SC)	LDA	Dsl	RUNEX	5	PM10	0.0363
2027	Annual	Riverside (SC)	LDA	Dsl	RUNEX	5	PM2_5	0.0348
2027	Annual	Riverside (SC)	LDA	Gas	RUNEX	5	ROG	0.0439
2027	Annual	Riverside (SC)	MDV	Dsl	RUNEX	5	PM10	0.0237
2027	Annual	Riverside (SC)	MDV	Dsl	RUNEX	5	PM2_5	0.0227
2027	Annual	Riverside (SC)	MDV	Gas	RUNEX	5	ROG	0.0881
2027	Annual	Riverside (SC)	MHDT	Dsl	RUNEX	5	PM10	0.0237
2027	Annual	Riverside (SC)	MHDT	Dsl	RUNEX	5	PM2_5	0.0226
2027	Annual	Riverside (SC)	MHDT	Gas	RUNEX	5	ROG	0.2110
2027	Annual	Riverside (SC)	HHDT	Dsl	RUNEX	5	PM10	0.0121
2027	Annual	Riverside (SC)	HHDT	Dsl	RUNEX	5	PM2_5	0.0116
2027	Annual	Riverside (SC)	HHDT	Gas	RUNEX	5	ROG	4.0750
2027	Annual	Riverside (SC)	LDA	Dsl	RUNEX	35	PM10	0.0106
2027	Annual	Riverside (SC)	LDA	Dsl	RUNEX	35	PM2_5	0.0101
2027	Annual	Riverside (SC)	LDA	Gas	RUNEX	35	ROG	0.0062
2027	Annual	Riverside (SC)	MDV	Dsl	RUNEX	35	PM10	0.0073
2027	Annual	Riverside (SC)	MDV	Dsl	RUNEX	35	PM2_5	0.0070
2027	Annual	Riverside (SC)	MDV	Gas	RUNEX	35	ROG	0.0128
2027	Annual	Riverside (SC)	MHDT	Dsl	RUNEX	35	PM10	0.0050
2027	Annual	Riverside (SC)	MHDT	Dsl	RUNEX	35	PM2_5	0.0048
2027	Annual	Riverside (SC)	MHDT	Gas	RUNEX	35	ROG	0.0297
2027	Annual	Riverside (SC)	HHDT	Dsl	RUNEX	35	PM10	0.0073
2027	Annual	Riverside (SC)	HHDT	Dsl	RUNEX	35	PM2_5	0.0070
2027	Annual	Riverside (SC)	HHDT	Gas	RUNEX	35	ROG	0.5800

OFFROAD2021 TRU Data

Model Output: OFFROAD2021 (v1.0.5) Emissions Inventory
Region Type: Sub-Area
Region: Riverside (SC)
Calendar Year: 2027
Scenario: All Adopted Rules - Exhaust
Vehicle Classification: OFFROAD2021 Equipment Types

Region	Calendar Year	Vehicle Category	Model Year	Horsepower	Fuel	Population	Emissions (gm/hr) PM10	PM2.5
Riverside (SC)	2027	Transport Refrigeration Unit - Instate Trailer	Aggregate	25	Diesel	826	0.20	0.18

Michael Hendrix Consulting

ATTACHMENT D

UPDATED CALEEMOD OUTPUT

REVISED GHG EMISSIONS CALCULATIONS SUMMARY

Unmitigated

Truck Trips			
EIR Calcs	27,496.15	214	TRUs
New Calcs	32,928.90	1348	gms/hr
		0.001348	MT/hr
TRUs		4	hrs/TRU
EIR Calcs	0.00	365	days/year
New Calcs	421.17	421.17	Total TRU Emissions

Total Truck EIR Calcs	27,496.15
Total New Truck Calcs	33,350.07
Difference	5,853.92
EIR Calcs Total Project	56,902.96
Toal New Project Calcs	62,756.88

Mitigated

EIR Calcs	38,726.25
New Calcs	44,580.17

Additional Mitigation	
Solar	399.41
3-min Idle	48.62
elect TRU	379.05
Elect Construction Equipment	48.75
Total Reductions	875.83
Total Mitigated Emissions with Additional Mitigation	43,704.34

	idling/5 min	Idling/min	Trk Trips/day	Days/year	Reduction
	0.0001	0.00002	3330	365	in Idle minutes
3-min Idle	48.62				2

Sunset Crossroads Operations All Phases Combined - HD Vehicles - with Project Features - San Bernardino-South Coast County, Annual

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

Sunset Crossroads Operations All Phases Combined - HD Vehicles - with Project Features

San Bernardino-South Coast County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Heavy Industry	197.50	1000sqft	4.53	197,500.00	0
Refrigerated Warehouse-No Rail	330.00	1000sqft	7.58	330,000.00	0
Unrefrigerated Warehouse-No Rail	5,017.50	1000sqft	115.19	5,017,500.00	0
Gasoline/Service Station	26.00	Pump	0.08	7,500.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	32
Climate Zone	10			**Operational Year**	2027
Utility Company	User Defined				
CO2 Intensity (lb/MWhr)	115.57	**CH4 Intensity (lb/MWhr)**	0.012	**N2O Intensity (lb/MWhr)**	0.001

1.3 User Entered Comments & Non-Default Data

Project Characteristics - Utility Emission Factors for Banning Electric

Land Use - Gas station size per project plans.

Construction Phase - Operations-only analysis.

Off-road Equipment - Operations-only analysis.

Trips and VMT - Operations-only analysis.

Grading - Operations-only analysis.

Architectural Coating - Operations-only analysis.

Date: 4/30/2024 12:26 PM

Sunset Crossroads Operations All Phases Combined - HD Vehicles - with Project Features - San Bernardino-South Coast County, Annual

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

Vehicle Trips - Trip Rates from Traffic Study, Trip Lengths based on SCAQMD WAIRE Methodology

Table Name	Column Name	Default Value	New Value
tblAreaCoating	Area_Nonresidential_Exterior	2776250	0
tblAreaCoating	Area_Nonresidential_Interior	8328750	0
tblConstructionPhase	NumDays	120.00	0.00
tblConsumerProducts	ROG_EF	1.98E-05	0
tblConsumerProducts	ROG_EF_Degreaser	3.542E-07	0
tblConsumerProducts	ROG_EF_PesticidesFertilizers	5.152E-08	0
tblEnergyUse	LightingElect	2.93	0.00
tblEnergyUse	LightingElect	2.93	0.00
tblEnergyUse	LightingElect	2.37	0.00
tblEnergyUse	LightingElect	1.17	0.00
tblEnergyUse	NT24E	5.02	0.00
tblEnergyUse	NT24E	5.02	0.00
tblEnergyUse	NT24E	36.52	0.00
tblEnergyUse	NT24E	0.82	0.00
tblEnergyUse	NT24NG	17.13	0.00
tblEnergyUse	NT24NG	17.13	0.00
tblEnergyUse	NT24NG	48.51	0.00
tblEnergyUse	NT24NG	0.03	0.00
tblEnergyUse	T24E	1.97	0.00
tblEnergyUse	T24E	1.97	0.00
tblEnergyUse	T24E	0.95	0.00
tblEnergyUse	T24E	0.33	0.00
tblEnergyUse	T24NG	15.20	0.00
tblEnergyUse	T24NG	15.20	0.00
tblEnergyUse	T24NG	3.22	0.00

Sunset Crossroads Operations All Phases Combined - HD Vehicles - with Project Features - San Bernardino-South Coast County, Annual

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

tblEnergyUse	T24NG	1.98	0.00
tblFleetMix	HHD	0.02	0.79
tblFleetMix	HHD	0.02	0.60
tblFleetMix	HHD	0.02	0.54
tblFleetMix	HHD	0.02	0.74
tblFleetMix	LDA	0.55	0.00
tblFleetMix	LDA	0.55	0.00
tblFleetMix	LDA	0.55	0.00
tblFleetMix	LDA	0.55	0.00
tblFleetMix	LDT1	0.06	0.00
tblFleetMix	LDT1	0.06	0.00
tblFleetMix	LDT1	0.06	0.00
tblFleetMix	LDT1	0.06	0.00
tblFleetMix	LDT2	0.17	0.00
tblFleetMix	LDT2	0.17	0.00
tblFleetMix	LDT2	0.17	0.00
tblFleetMix	LDT2	0.17	0.00
tblFleetMix	LHD1	0.02	0.02
tblFleetMix	LHD1	0.02	0.09
tblFleetMix	LHD1	0.02	0.17
tblFleetMix	LHD1	0.02	0.06
tblFleetMix	LHD2	6.8240e-003	0.08
tblFleetMix	LHD2	6.8240e-003	0.10
tblFleetMix	LHD2	6.8240e-003	0.06
tblFleetMix	LHD2	6.8240e-003	0.07
tblFleetMix	MCY	0.02	0.00
tblFleetMix	MCY	0.02	0.00

Sunset Crossroads Operations All Phases Combined - HD Vehicles - with Project Features - San Bernardino-South Coast County, Annual

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

tblFleetMix	MCY	0.02	0.00
tblFleetMix	MCY	0.02	0.00
tblFleetMix	MDV	0.13	0.02
tblFleetMix	MDV	0.13	0.09
tblFleetMix	MDV	0.13	0.17
tblFleetMix	MDV	0.13	0.06
tblFleetMix	MH	4.1930e-003	0.00
tblFleetMix	MH	4.1930e-003	0.00
tblFleetMix	MH	4.1930e-003	0.00
tblFleetMix	MH	4.1930e-003	0.00
tblFleetMix	MHD	0.01	0.08
tblFleetMix	MHD	0.01	0.10
tblFleetMix	MHD	0.01	0.06
tblFleetMix	MHD	0.01	0.07
tblFleetMix	OBUS	5.4600e-004	0.00
tblFleetMix	OBUS	5.4600e-004	0.00
tblFleetMix	OBUS	5.4600e-004	0.00
tblFleetMix	OBUS	5.4600e-004	0.00
tblFleetMix	SBUS	9.6100e-004	0.00
tblFleetMix	SBUS	9.6100e-004	0.00
tblFleetMix	SBUS	9.6100e-004	0.00
tblFleetMix	SBUS	9.6100e-004	0.00
tblFleetMix	UBUS	2.4200e-004	0.00
tblFleetMix	UBUS	2.4200e-004	0.00
tblFleetMix	UBUS	2.4200e-004	0.00
tblFleetMix	UBUS	2.4200e-004	0.00
tblLandscapeEquipment	NumberSummerDays	250	0

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

tblLandUse	LandUseSquareFeet	3,670.55	7,500.00
tblProjectCharacteristics	CH4IntensityFactor	0	0.012
tblProjectCharacteristics	CO2IntensityFactor	0	115.57
tblProjectCharacteristics	N2OIntensityFactor	0	0.001
tblSolidWaste	SolidWasteGenerationRate	14.01	0.00
tblSolidWaste	SolidWasteGenerationRate	244.90	0.00
tblSolidWaste	SolidWasteGenerationRate	310.20	0.00
tblSolidWaste	SolidWasteGenerationRate	4,716.45	0.00
tblTripsAndVMT	WorkerTripNumber	18.00	0.00
tblVehicleTrips	CC_TTP	28.00	0.00
tblVehicleTrips	CNW_TTP	13.00	0.00
tblVehicleTrips	CNW_TTP	41.00	0.00
tblVehicleTrips	CNW_TTP	41.00	0.00
tblVehicleTrips	CW_TL	16.60	29.94
tblVehicleTrips	CW_TL	16.60	28.47
tblVehicleTrips	CW_TL	16.60	33.25
tblVehicleTrips	CW_TTP	59.00	100.00
tblVehicleTrips	CW_TTP	59.00	100.00
tblVehicleTrips	CW_TTP	59.00	100.00
tblVehicleTrips	DV_TP	27.00	0.00
tblVehicleTrips	DV_TP	5.00	0.00
tblVehicleTrips	DV_TP	5.00	0.00
tblVehicleTrips	DV_TP	5.00	0.00
tblVehicleTrips	PB_TP	59.00	0.00
tblVehicleTrips	PB_TP	3.00	0.00
tblVehicleTrips	PB_TP	3.00	0.00
tblVehicleTrips	PB_TP	3.00	0.00

Sunset Crossroads Operations All Phases Combined - HD Vehicles - with Project Features - San Bernardino-South Coast County, Annual

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

tblVehicleTrips	PR_TP	14.00	100.00
tblVehicleTrips	PR_TP	92.00	100.00
tblVehicleTrips	PR_TP	92.00	100.00
tblVehicleTrips	PR_TP	92.00	100.00
tblVehicleTrips	ST_TR	182.17	44.77
tblVehicleTrips	ST_TR	6.42	0.44
tblVehicleTrips	ST_TR	2.12	0.75
tblVehicleTrips	ST_TR	1.74	0.37
tblVehicleTrips	SU_TR	166.88	44.77
tblVehicleTrips	SU_TR	5.09	0.44
tblVehicleTrips	SU_TR	2.12	0.75
tblVehicleTrips	SU_TR	1.74	0.37
tblVehicleTrips	WD_TR	172.01	44.77
tblVehicleTrips	WD_TR	3.93	0.44
tblVehicleTrips	WD_TR	2.12	0.75
tblVehicleTrips	WD_TR	1.74	0.37
tblWater	IndoorWaterUseRate	345,329.11	0.00
tblWater	IndoorWaterUseRate	45,671,875.00	0.00
tblWater	IndoorWaterUseRate	76,312,500.00	0.00
tblWater	IndoorWaterUseRate	1,160,296,875.00	0.00
tblWater	OutdoorWaterUseRate	211,653.32	0.00

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

Sunset Crossroads Operations All Phases Combined - HD Vehicles - with Project Features - San Bernardino-South Coast County, Annual

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

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2023	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Maximum	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2023	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Maximum	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

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

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
		Highest		

2.2 Overall Operational

Sunset Crossroads Operations All Phases Combined - HD Vehicles - with Project Features - San Bernardino-South Coast County, Annual

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

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	1.4435	64.4206	20.4630	0.3215	12.5242	0.6498	13.1740	3.4751	0.6215	4.0966	0.0000	31,512.1375	31,512.1375	1.1194	4.6603	32,928.9009
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**1.4435**	**64.4206**	**20.4630**	**0.3215**	**12.5242**	**0.6498**	**13.1740**	**3.4751**	**0.6215**	**4.0966**	**0.0000**	**31,512.1375**	**31,512.1375**	**1.1194**	**4.6603**	**32,928.9009**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	1.4435	64.4206	20.4630	0.3215	12.5242	0.6498	13.1740	3.4751	0.6215	4.0966	0.0000	31,512.1375	31,512.1375	1.1194	4.6603	32,928.9009

Sunset Crossroads Operations All Phases Combined - HD Vehicles - with Project Features - San Bernardino-South Coast County, Annual

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

Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**1.4435**	**64.4206**	**20.4630**	**0.3215**	**12.5242**	**0.6498**	**13.1740**	**3.4751**	**0.6215**	**4.0966**	**0.0000**	**31,512.1375**	**31,512.1375**	**1.1194**	**4.6603**	**32,928.9009**

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

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Construction not analyzed	Site Preparation	4/3/2023	4/2/2023	5	0	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating –

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Construction not analyzed	Rubber Tired Dozers	3	8.00	247	0.40
Construction not analyzed	Tractors/Loaders/Backhoes	4	8.00	97	0.37

Trips and VMT

Date: 4/30/2024 12:26 PM

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

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Construction not analyzed	7	0.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Construction not analyzed - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

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

Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					

Sunset Crossroads Operations All Phases Combined - HD Vehicles - with Project Features - San Bernardino-South Coast County, Annual

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

Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	1.4435	64.4206	20.4630	0.3215	12.5242	0.6498	13.1740	3.4751	0.6215	4.0966	0.0000	31,512.1375	31,512.1375	1.1194	4.6603	32,928.9009
Unmitigated	1.4435	64.4206	20.4630	0.3215	12.5242	0.6498	13.1740	3.4751	0.6215	4.0966	0.0000	31,512.1375	31,512.1375	1.1194	4.6603	32,928.9009

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Gasoline/Service Station	1,164.02	1,164.02	1164.02	3,507,839	3,507,839

Sunset Crossroads Operations All Phases Combined - HD Vehicles - with Project Features - San Bernardino-South Coast County, Annual

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

General Heavy Industry	86.90	86.90	86.90	947,050	947,050
Refrigerated Warehouse-No Rail	247.50	247.50	247.50	2,564,862	2,564,862
Unrefrigerated Warehouse-No Rail	1,832.00	1,832.00	1832.00	22,172,692	22,172,692
Total	3,330.42	3,330.42	3,330.42	29,192,443	29,192,443

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Gasoline/Service Station	16.60	8.40	6.90	2.00	79.00	19.00	100	0	0
General Heavy Industry	29.94	8.40	6.90	100.00	0.00	0.00	100	0	0
Refrigerated Warehouse-No Rail	28.47	8.40	6.90	100.00	0.00	0.00	100	0	0
Unrefrigerated Warehouse-No Rail	33.25	8.40	6.90	100.00	0.00	0.00	100	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Gasoline/Service Station	0.000000	0.000000	0.000000	0.024910	0.024910	0.080760	0.080760	0.788660	0.000000	0.000000	0.000000	0.000000	0.00000
General Heavy Industry	0.000000	0.000000	0.000000	0.093020	0.093020	0.104650	0.104650	0.604660	0.000000	0.000000	0.000000	0.000000	0.00000
Refrigerated Warehouse-No Rail	0.000000	0.000000	0.000000	0.173390	0.173390	0.056450	0.056450	0.540320	0.000000	0.000000	0.000000	0.000000	0.00000
Unrefrigerated Warehouse-No Rail	0.000000	0.000000	0.000000	0.062640	0.062640	0.068640	0.068640	0.737440	0.000000	0.000000	0.000000	0.000000	0.00000

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e

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

Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Gasoline/Service Station	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
General Heavy Industry	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Refrigerated Warehouse-No Rail	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Unrefrigerated Warehouse-No Rail	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

Sunset Crossroads Operations All Phases Combined - HD Vehicles - with Project Features - San Bernardino-South Coast County, Annual

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

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Gasoline/Service Station	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
General Heavy Industry	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Refrigerated Warehouse-No Rail	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Unrefrigerated Warehouse-No Rail	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Gasoline/Service Station	0	0.0000	0.0000	0.0000	0.0000
General Heavy Industry	0	0.0000	0.0000	0.0000	0.0000
Refrigerated Warehouse-No Rail	0	0.0000	0.0000	0.0000	0.0000
Unrefrigerated Warehouse-No Rail	0	0.0000	0.0000	0.0000	0.0000

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Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Gasoline/Service Station	0	0.0000	0.0000	0.0000	0.0000
General Heavy Industry	0	0.0000	0.0000	0.0000	0.0000
Refrigerated Warehouse-No Rail	0	0.0000	0.0000	0.0000	0.0000
Unrefrigerated Warehouse-No Rail	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

6.0 Area Detail

6.1 Mitigation Measures Area

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	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

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	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000

7.2 Water by Land Use

Unmitigated

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

Land Use	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
	Mgal	MT/yr			
Gasoline/Service Station	0 / 0	0.0000	0.0000	0.0000	0.0000
General Heavy Industry	0 / 0	0.0000	0.0000	0.0000	0.0000
Refrigerated Warehouse-No Rail	0 / 0	0.0000	0.0000	0.0000	0.0000
Unrefrigerated Warehouse-No Rail	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

Land Use	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
	Mgal	MT/yr			
Gasoline/Service Station	0 / 0	0.0000	0.0000	0.0000	0.0000
General Heavy Industry	0 / 0	0.0000	0.0000	0.0000	0.0000
Refrigerated Warehouse-No Rail	0 / 0	0.0000	0.0000	0.0000	0.0000
Unrefrigerated Warehouse-No Rail	0 / 0	0.0000	0.0000	0.0000	0.0000

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Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Gasoline/Service Station	0	0.0000	0.0000	0.0000	0.0000

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

General Heavy Industry	0	0.0000	0.0000	0.0000	0.0000
Refrigerated Warehouse-No Rail	0	0.0000	0.0000	0.0000	0.0000
Unrefrigerated Warehouse-No Rail	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Gasoline/Service Station	0	0.0000	0.0000	0.0000	0.0000
General Heavy Industry	0	0.0000	0.0000	0.0000	0.0000
Refrigerated Warehouse-No Rail	0	0.0000	0.0000	0.0000	0.0000
Unrefrigerated Warehouse-No Rail	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

9.0 Operational Offroad

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

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

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

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

Boilers

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

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

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