Prologis Oakland Global Logistics Center

Air Quality Plan for Operations of the Good Eggs Fulfillment Center

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Approved by the City Administrator on September 23, 2019

Address: 2000 Maritime St., Suite 200, Oakland, CA 94607
Site Ref: CE-2, Southeast Gateway Parcel

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v.1 – April 23, 2019
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good eggs

PROLOGIS

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1. INTRODUCTION

Prologis is the leading global owner, operator, and developer of logistics real estate. We serve manufacturers, retailers, e-commerce businesses, transportation companies, and logistics providers with the facilities that support local, regional and global trade. Our buildings are located close to transportation infrastructure such as railways, seaports, highways, and airports. We provide our customers with best-in-class facilities and have a long history of industry-leading corporate governance and transparency.

As the ground lessee of 58 acres of the City's former Oakland Army Base site (OAB) property for the next 66 years, we intend to be good stewards of the land, and recognize the concerns of the West Oakland community we and our tenants will operate in. Prologis is also committed to the success of our business and the success of our customer's businesses who will occupy our warehouse buildings at the OAB.

Working towards the goals for improved air quality will require coordination and collaboration from all tenants of these warehouses to plan and implement emission reduction actions that are impactful, practical, and feasible.

1.1 Purpose of this Air Quality Plan for Operations of the Good Eggs Facility

The purpose of this Air Quality Plan for Operations of the Good Eggs Facility at CE-2 Warehouse (Plan) is to:

- Provide clear direction for tenant of this warehouse regarding operation air quality and energy conservation requirements for Tenant Improvements (TI) and for on-going operations throughout the duration of their lease.
- Provide a documented path of compliance for the Standard Conditions of Approval/Mitigation Monitoring and Report Program (SCA/MMRP) relating to air quality and public outreach as outlined in Mitigation Measure PO-1, which involves public outreach to Oakland Army Base stakeholders.

The Oakland Army Base Redevelopment project was approved by the City of Oakland (City) in 2002, and then revised with an Initial Study/Addendum in 2012 (OAB Project). In both of these documents, the goals and mitigations were very broad, attempting to cast a wide net over a master plan level development that was still in the conceptual stage. One of the objectives of this diesel emission reduction and operational air quality plan for the Good Eggs facility is to clarify and distill which requirements apply to operations of this particular facility, to clarify any vagueness in the applicable SCA/MMs and to comply with the mitigation measures.

1.1.1 : This document applies to the tenant referred to as Good Eggs, which will occupy a 116,246 s.f. portion of the 232,785 s.f. warehouse at the Oakland Global Logistics Center, referred to as CE-2, address: 2000 Maritime Street.

1.1.2 : The tenant is required to comply with all applicable state and regional air quality regulations and is required to implement the components of this document.

1.1.3 : The tenant will be required to demonstrate how compliance is achieved on the

specific user level. 1.1.4: This Plan will become a component of tenant Lease documents.

1.1.5: The City of Oakland, as the lead agency under the California Environmental Quality Act (CEQA), will determine compliance with the applicable mitigation measures and will determine compliance with this Plan.

2. TENANT SUBJECT TO THIS PLAN

2.1 This Plan applies to the tenant referred to as Good Eggs, which will occupy a portion (116,246 s.f.) of the Prologis warehouse referred to as CE-2 located at 2000 Maritime Street. The shell of the building is anticipated to be completed in March 2019, with tenant improvements being completed by June 2019.

Description of Operations

- Good Eggs is an online grocery and meal kit delivery service that provides absurdly fresh local produce, meal kits for every occasion, grocery staples, and wine, beer, and spirits – all delivered same day to Bay Area Homes.
- Receives deliveries by gasoline powered box trucks, vans, cars and some diesel semi-trucks.
- Roughly half the semi-truck deliveries and 2/3 of the box truck deliveries arrive in refrigerated vehicles.
- Refrigerated product arrives in vehicles as described above.
- Electrical outlets at the loading docks at the refrigerated warehouse area are installed so any trucks that are capable of plugging into power can run their refrigeration off of the electricity while loading and unloading.
- Approximately 36,000 square feet of the facility will be refrigerated or freezer space.
- Good Eggs is using a state-of-the-art CO_2 refrigeration system, which has 1,500 to 4,000 times less of a detrimental effect on the environment than that of traditional synthetic refrigerant.
- Good Eggs takes these deliveries and repacks them in the warehouse for delivery per customer orders.

- Products in the warehouse are moved by manually-propelled carts, racks, and pallet jacks; or on electric order pickers and fork lifts.
- At peak capacity, Good Eggs expects to send out 120 delivery routes on an average day, with a fleet of up to 40 vehicles. These vehicles will be 40% gasoline powered box trucks and 60% gasoline powered Sprinter / Transit vans. Each vehicle of the fleet will make 2-3 deliveries with the remainder of delivery routes taken in personal vehicles.
- At launch, Good Eggs expects to have a fleet of 15 vehicles. There will be one gasoline box truck and the rest will all be gasoline Sprinter / Transit type vans.
- All new fleet vehicles equipped with diesel driven TRU's will be electric plug-in capable.
- Employee count: Good Eggs will launch with 50 employees for warehouse operations with peak capacity up to 300 employees, not including delivery drivers described above.

Inbound Deliveries by type and frequency (Avg / day) at launch (2019):

Semi Truck - Diesel	6.85
Box Truck - Non-Diesel	21.74
Van or Car - Non-Diesel	32.43
Third Party Carrier [1]	4.00

Inbound Deliveries by type and frequency (Avg / day) at peak capacity (2022):

Semi Truck - Diesel	10.14
Box Truck - Non-Diesel	25.57
Ice - Non-Diesel	1.00
Van or Car - Non-Diesel	32.43
Third Party Carrier	4.00

[1] Third party carrier vehicles were assumed to be Light Heavy Duty (LHD) Trucks with the average percentage of diesel and gasoline engines in CalEEMod as derived from the ARB EMFAC emission model

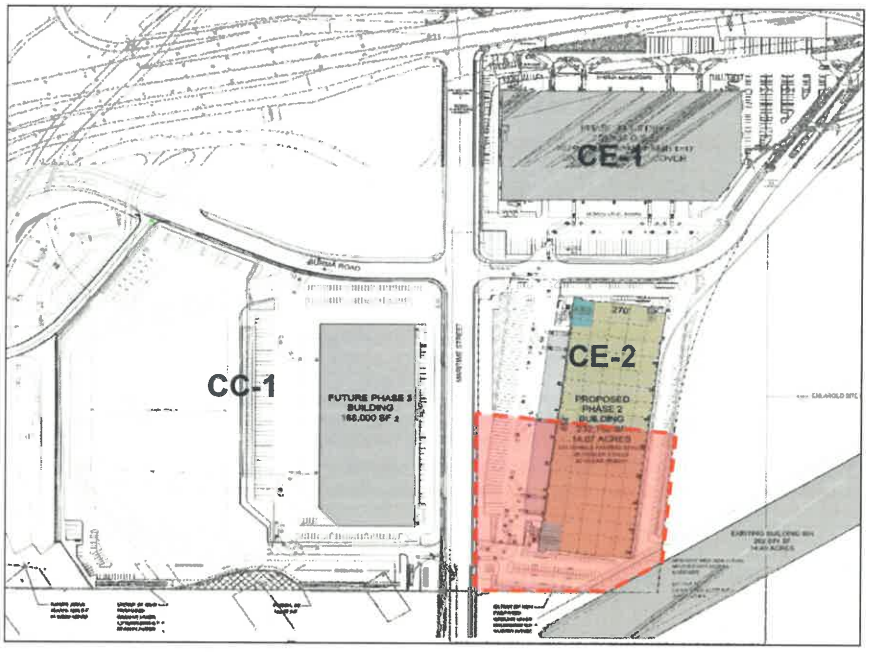

Figure 1: Site Plan – Overall Site showing building and Good Eggs' lease area subject to this Plan

2.2. Upon termination of the Good Eggs lease, a different Air Quality Plan or an addendum to this Plan may be required as determined by the City. Stakeholder notification will be provided for revisions the City determines to be substantive.

2.3: If an amendment or exception to this Plan is requested or determined to be necessary, the City will evaluate the scope of the amendment/exception and shall determine the necessary process for undertaking such an amendment/exception. Stakeholder notification will be provided for amendments or exceptions which the City determines to be substantive.

3. SCA/MMRP REQUIREMENTS

The OAB project was approved in 2002, and then revised with an Initial Study/Addendum in 2012. The City of Oakland prepared a SCA/MMRP, which was approved by the Oakland City Council on July 16, 2013, superseding a previous version dated October 15, 2012. This Plan focuses on the air quality conditions of approval and mitigation measures (together "MM's") identified in the SCA/MMRP. The entirety of the SCA/MMRP is available on the

City of Oakland website.

Table 1 below lists the air quality-related MMs applicable to this tenant/building. Prior to receiving the building shell and sitework permits for construction of this building, Prologis prepared (and the City approved) the Construction Management Plan, which addressed the construction related air quality MMs. The table below shows how the applicable air quality MMs are addressed. Additionally, it should be noted that SCA Air-3 and MM 4.4-3b do not apply to the Good Eggs operations. SCA Air-3 applies only to buildings which will contain sensitive receptors (e.g., hospitals, schools, etc.) and MM 4.4-3b applies only to maritime uses at the West Gateway bulk marine terminal.

Table 1: Summary of Air Quality SCA/MMRP Requirements and the Response Method which addresses each one

SCA/MM #	Description	Response Method
AIR-1	Construction Management Plan	Construction Mgmt Plan/Previously Approved
AIR-2	Construction Related Air Pollution Controls	Construction Mgmt Plan/Previously Approved
TRANS-2	Construction Traffic & Parking	Construction Mgmt Plan/Previously Approved
MM 4.3-13	Traffic Control Plan – Hazmat	Construction Mgmt Plan/NA
MM 4.4-6	Energy Conserving Fixtures/Design	Air Quality Operational Plan
MM 4.4-4	Truck Diesel Emissions Reduction Plan	Air Quality Operational Plan
MM 4.4-5	Transportation Control Measures	Air Quality Operational Plan
TRANS-1	Parking and Transportation Demand Mgmt	Air Quality Operational Plan
MM 5.4-1	Demonstration Projects	Air Quality Operational Plan

4. Elements of this Air Quality Plan for Operations of the Good Eggs Facility

This Plan contains the following components:

4.1) Truck and Equipment Diesel Emission Reduction (MM 4.4-4)
4.2) Encourage, Lobby, and Participate in Emission Reduction Demonstration Projects (MM 5.4-1) 4.3) Technology Review Program (MM 4.4-4)
4.4) Sustainable Design and Construction (MM 4.4-6)

4.5) Transportation Control Measures and Parking/Transportation Demand Management (SCA TRANS-1, MM 4.4-5)
4.6) Quantification of Diesel Emissions (4.4-4)

4.1 Truck and Equipment Diesel Emission Reduction

The requirements listed below will reduce the diesel emissions, including diesel particulate matter and nitrogen oxides, produced during the operation of this warehouse.

Trucks

4.1.1) On-Road Trucks – All diesel trucks with a gross vehicle weight rating over 14,000 pounds entering the site of this warehouse must comply with the Truck and Bus Regulation of CARB which is in effect at the time of operation of the truck(s).

4.1.2) Drayage Trucks[1] – Should Good Eggs receive cargo from the maritime terminals, an intermodal rail yard, or property of the Port of Oakland, the trucks doing so must comply with the Drayage Truck Regulation (DTR) of the California Air Resources Board (CARB) which is in effect at the time of operation of the truck(s). See California Air Resource Board's Drayage Truck Regulation for more details, including truck engine year requirements and truck registry requirements.

4.1.3) Trucks with transport refrigeration units (TRUs) – Roughly half the semi-truck deliveries and 2/3 of the box truck deliveries arrive at the Good Eggs facility in refrigerated vehicles. Electrical outlets are planned and required to be installed at the loading docks serving the refrigerated portion of the facility so trucks can run refrigeration with electricity while loading and unloading. Good Eggs shall use "good faith" efforts such as posting signs on the loading dock indicating plug-in availability and email notification to vendors encouraging use of plug in capable vehicles at the Good Eggs facility to maximize the number of deliveries with plug-in refrigeration compatible delivery trucks with the goal of 100%. Good Eggs would be responsible for ensuring use of electrical outlets during loading and unloading per Section 4.1.4 below.

[1] Drayage trucks are defined by CARB as diesel-fueled Class 7 or Class 8 Trucks with gross vehicle weight rating 26,001 lbs. or more that transport cargo, containers, or chassis to or from a port or intermodal rail yard in CA.

4.1.4) Idling Rules for all trucks - All size and types of in-bound and out-bound delivery vehicles shall be prohibited from idling more than 2 minutes when loading and unloading or staging at this site. The idling rules shall be posted in easily-visible locations on-site and shall be enforced by Good Eggs.

4.1.5) Management of Loading Docks or loading/unloading - A dock management or loading/unloading system shall be developed and implemented by Good Eggs for delivery requirements to ensure that truck idling times do not exceed two minutes when the trucks are on site, and that electric capable TRU's are plugged-in, and that on-site TRU diesel engine runtime be no more than fifteen minutes.

4.1.6) Compliance with Truck Routes and with the West Oakland Truck Management Plan – All trucks serving the Good Eggs warehouse must use designated truck routes to arrive and depart from this building. Additionally, such trucks shall comply with the West Oakland Truck Management Plan (approved by the City and Port on April, 2019), or with other City-approved truck regulations in effect at the time of operation of the truck serving this tenancy.

4.1.7) CARB Compliance for Trucks –

a. Compliance with applicable air quality regulations for commercial trucks and vans are required including, but not limited to, the CARB Tractor-Trailer Greenhouse Gas Reduction Regulation, Periodic Smoke Inspection Program, Statewide Truck and Bus Regulation or Drayage Regulation.

b. All truck fleets owned by Good Eggs, or under contract with Good Eggs to provide delivery services to/from this warehouse, shall provide proof of compliance through CARB certificates of compliance or copies of annual smoke test results.

Off-Road Equipment used in the Good Eggs operation

4.1.8) Off-Road Equipment

a. Outdoor off-road equipment over 25 horsepower, including but not limited to yard equipment, exterior forklifts and pallet jacks, shall be zero and near-zero emission equipment. This includes Tier 4i or Tier 4 diesel equipment (or equivalent if Tier system is not applicable to a particular piece of equipment). Such equipment can also be electric, propane, bio-diesel, and alternative-fueled equipment.

b. Indoor off-road equipment including but not limited to interior forklifts, scissor lifts, pallet jacks and "order pickers" shall be electric, propane or alternative-fueled equipment.

c. Good Eggs shall submit an equipment list of all off-road equipment to be used both indoors and outdoors to demonstrate that zero and near-zero emission (including Tier 4 or 4i diesel equipment or equivalent) equipment, or electric, propane, bio-diesel or alternative-fueled equipment will be used during operations.

d. All off-road equipment shall be properly serviced and maintained throughout the life of the equipment.

e. Compliance with all applicable CARB regulations for off-road diesel equipment used at this site is required, including but not limited to the Diesel Off-Road Online Reporting System (DOORS) and the Equipment Identification Number (EIN).

f. Also see Section 4.3 of this Plan related to the Technology Review Program.

4.1.9) Idling Rules for off-road equipment - Diesel off-road equipment shall be prohibited from idling more than 2 minutes when loading and unloading, staging, or when not in active use. See CARB regulation for in-use off-road diesel vehicles for clarification of what is considered idling. The idling rules shall be posted in easily-visible locations on-site.

4.2 Participation in Emissions Reduction Demonstration Projects

Good Eggs shall evaluate emission reduction demonstration projects that promote technological advances in improving air quality. Examples of some demonstration projects include but not limited to: CNG/LNG trucks energy generation via alternative systems electricity.

Good Eggs is encouraged to utilize innovative and cleaner technology/equipment from operations in other Good Eggs locations.

Good Eggs will provide contact information to the BAAQMD for receipt of information regarding grants, vouchers and other funding opportunities for demonstration opportunities.

Good Eggs will report on demonstration projects considered per the Technology Review Program below.

4.3. Technology Review Program

Good Eggs shall use cleaner technology over time as it becomes more readily available, practical and economically feasible. To accomplish this, Good Eggs shall review new technology every three years and with equipment turnover (prior to acquisition of, or lease of) additional or replacement of Good Eggs fleet trucks or on-site equipment to see

if zero or near-zero equipment is economically feasible and practical.

Good Eggs shall investigate and make part of such analysis, any grant, voucher or other type of program that would help offset cost and / or otherwise make such equipment available, practical and economically feasible. Good Eggs shall submit such technology review to the City upon request.

If the technology review demonstrates that new technology/equipment will be effective in substantially reducing emissions, is available, practical and economically feasible as determined by Good Eggs, then Good Eggs shall implement such technology within 12 months.

4.4 Sustainable Design and Construction

Sustainable design of tenant improvements has a beneficial impact on long-term emissions reduction, improved air quality and reduced energy consumption. Tenants are required to comply with all applicable state and regional air quality regulations and are required to implement the following:

4.4.1) LEED Gold – The core and shell of this building achieved a "Gold" level certification per the United States Green Building Council's (USGBC's) Leadership in Environmental and Environmental Design (LEED) rating system, which surpassed the requirements of the statewide Title 24 building code requirements and the requirements of the SCA/MMRP. As part of the Gold level Core and Shell certification, it is expected that the tenant improvements (TI) will be performed under a separate scope and includes a provision to include the following sustainable design measures in the TI not a part of the shell build-out.

Good Eggs must follow the design guidelines set forth under LEED Gold Core and Shell system. This LEED addenda shall be included by Prologis as an exhibit to the tenant's lease. In 2018, requirements of LEED Gold include items such as:

- Bike storage, changing rooms and showers
- Low flow plumbing fixtures
- Energy efficient lighting, including light emitting diode fixtures (LED)
- Natural ventilation

Good Eggs is also encouraged, but not required, to obtain LEED-CI (Commercial Interiors) certification, preferably also at a Gold level.

4.4.2) Title 24 Compliance – Tenant construction and improvements shall meet Title 24 (Building Energy Efficiency Program) of the International Building Code (IBC)/California Code of Regulations (CCR) to satisfy Mitigation Measure 4-4.6. This will be required in order to obtain a building or TI permit from the City of Oakland.

4.4.3) Renewable Energy and Infrastructure for charging Electric Trucks and Off-Road Equipment–
a. The City encourages use of a renewable energy system or combination of systems (solar/wind/mechanical/tidal/hydrogen) designed to offset 20% of building's annual electrical consumption. Good Eggs and Prologis are currently working on providing solar panels to offset electricity demand with the plan to install once the exact refrigeration and electrical loads are determined.
b. Rooftop solar photovoltaic (PV) power is preferred and is in the planning stages.
c. The shell building roof structure of this warehouse building has been designed to support solar panel load.
d. The electrical room has been sized for additional future solar PV infrastructure.

4.5 Transportation Control Measures & Parking/Transportation Demand Management

Transportation Control Measures (TCMs) in MM4.4-5 are intended to provide alternative ways for employees to commute to work at this warehouse.

Transportation Control Measures
In addition to the fair share program implemented by the City and the Port for the OAB project, Good Eggs is required to implement TCMs 9, 11, and 13 per MM 4.4-5:

9 – Provide preferential parking for carpool and vanpool vehicles per City of Oakland and LEED standards.
11 – Secure, weather protected bicycle parking shall be provided on-site, such as through bike lockers. 13 – Showers and lockers will be provided part of the tenant improvements.

Additionally, electrical vehicle charging stations for cars will be installed in the parking lot of this warehouse and as well as necessary infrastructure in place for future truck charging stations.

4.5.1) Fair Share Participation – The developer of this building is participating in the City's defined "fair share" program and has contributed to it's fair share funded TCM programs, as described in the Fair Share Program. The City shall take lead on implementing the fair share program.

4.5.2) Parking and Transportation Demand Management – Good Eggs shall prepare and implement a Parking and Transportation Demand Management Plan per SCA TRANS-1, consistent with the number of onsite employees, with the goal of reducing drive-alone commute trips during the peak trafficperiods.

4.6 Quantification of Diesel Emissions

The 2012 Initial Study/Addendum analyzed whether the OAB Project (as defined in

Chapter 2 of the Initial Study/Addendum) would result in total OAB Project emissions which exceed 1999 BAAQMD Significance Thresholds as specified in the 2012 Addendum. Such Thresholds are established for reactive organic gases, nitrogen oxides (NOx), particulate matter (PM) 10 and PM2.5; the applicable Threshold for each of these pollutants as clarified on page 132 of the Initial Study/Addendum was 15 tons per year. Table 3.3-8 on page 150 of the Initial Study/Addendum shows that OAB Project emissions of NOx exceed the Threshold of Significance, while also showing that the other pollutants do not exceed the Threshold of Significance.

Operations of the Good Eggs facility shall, as stated in MM 4.4-4, "strive to reduce contributions to West Oakland diesel emissions to less than significant levels", using the thresholds of significance identified in the 2012 Initial Study/Addendum. Reducing diesel emissions will have two benefits: reducing NOx and reducing PM2.5, which is a toxic air contaminant.

To determine if the diesel emission reduction actions required by this Plan will reduce emissions associated with operations of the Good Eggs facility to a less than significant level, such emissions are quantified below.

This was done by quantifying the emissions from diesel trucks which will serve the Good Eggs facility using the Institute of Transportation Engineers (ITE) Trip Generation 10th edition OR actual verifiable data of the Good Eggs daily truck and passenger vehicle trips, and the most recent California Emissions Model (CALEEMod) to quantify emissions per ton per year for their operations.

RESULTS: This quantification of emissions was undertaken in August 2019 using data from Good Eggs on the daily truck and passenger vehicle trips and the CalEEMod 2016.3.2 model. This analysis looked at three different points in time: 1) At launch below full capacity (2019); full capacity (2022); and at 2024. The analysis showed that NOx emissions will be: 1) 0.66 tons per year at launch; 2) 0.84 NOx at full capacity in 2022 and; 3) 0.68 NOx in year 2024 (Exhibit A). A separate analysis was prepared to quantify the TRU emissions associated with the project while idling and while traveling through the local community. The TRU NOx emissions will be: 0.27 tons per year in 2019 and 0.46 tons per year in 2022 and 2024. The total NOx emissions including vehicles and TRUs will be: 0.92 ton per year in 2019, 1.30 tons per year in 2022, and 1.14 tons per year in 2024. This amount is below the Threshold of Significance for NOx which, per the 2012 Initial Study/Addendum, was 15 tons of NOx per year. As stated previously, the 2012 Initial Study / Addendum found that PM2.5 emissions associated with the trucks from this facility fall below the individual project threshold of increased cancer risk: less than 10 cases per million, non-cancer hazard index less than 1.0, and PM2.5 level of less than 0.3 ug/m^3 annual average.

4.6.1 As other uses and facilities are constructed at the OAB, the required operational air quality plan for each individual project will quantify its individual emissions and provide a calculation for the cumulative emissions of all permanent projects at the OAB based on the prior operational air quality plans against the Thresholds.

4.6.2 If emissions per tenant exceed the Threshold of Significance when added together with other permanent operations under way at the OAB, then all tenants will meet and discuss with the City what other feasible measures can be implemented to further reduce emissions from operations. Any measures agreed to by both City and tenants shall be implemented within a reasonable time period agreed upon by the City and the tenant(s).

5. PLAN IMPLEMENTATION

Good Eggs shall submit to the City's Environmental Review Officer documentation of compliance with each element of this Plan per table 2 below. The City will be responsible for reviewing and approving the compliance.

Such compliance shall be subject to audit at City's discretion, not more than one per year, other than the Technology Review which is to be submitted to the City every three years. The City shall give 30daynotice prior to audit. The results of the compliance audit shall be available upon request and posted to the City's website.

Table 2 – Operational AQ Plan Compliance Summary Table Example

ID	Description of Plan Element	Compliance Method/Description	Required Date of Compliance
4.1	**T/E Diesel Emission Reduction**		
	4.1.1 – Drayage Trucks	[provide truck or truck fleet compliance certificate]	If operations change such that drayage trucks are used; upon audit.
	4.1.2 – On Road Trucks	[provide truck fleet compliance certificate]	Prior to occupancy and upon audit.
	4.1.4 – Off Road Equipment	[provide off-road equipment fleet info; participate in CARB DOORS program]	Prior to occupancy and upon audit.
	4.1.6 – Idling Rules	[provide idling policy signage]	Prior to occupancy

	4.1.7 – Dock Management	[provide a plan to monitor truck deliveries and potential queuing]	Prior to occupancy
	4.1.8 – CARB Compliance	[provide fleet info]	Continuous; upon audit
4.2	**Sustainable TI Design**		
	4.2.1 – LEED Gold Compliance	[reference plan sheets or submittals where LEED Addenda items are shown]	Prior to occupancy
	4.2.2 – Title 24 Compliance	[provide statement on sheet indicating T24 compliance]	Prior to issuance of building permit for TI
	4.2.3 – Renewable Energy	[describe solar PV or other onsite renewable energy system – KW generation]	If proposed, prior to occupancy or per Technology Review
4.3	**Transportation Control Measures**		
	4.3.1 – Fund Fair Share Programs	[City assessed fair share]	Paid by Prologis in full
	4.3.2 – Parking/TDM Program	[provide a plan to reduce employee single-driver traffic]	Prior to occupancy
4.4	**Demonstration Projects**		
	4.4.1 – Demo Projects Participation	[provide any demonstration projects]	Continuous
4.5	**Technology Review**		
	4.5.1 – Technology Review Program	[provide periodic updates over time]	Continuous
4.6	Quantification of NOx emissions If cumulative threshold exceeded, Tenants and City will meet and discuss other feasible reduction measures to be implemented within an agreed upon time frame.		As needed

Timing to implement most of these plan elements will happen as the tenant improvements are constructed or as operations begin. However, Prologis nor the tenant controls the implementation timing of the fair share program elements. The fair share elements are City-led programs.

From time to time, tenant may be required to provide reporting on the progress or maintenance of various plan elements (for example, updating truck fleet as new vehicles are purchased). Any update requests shall be initiated by the City and tenant shall provide the requested information.

Exhibit A

This is a Summary of the report done by Mitchell Air Quality August 2019 submitted to the City and is included in this plan as Exhibit B.

Quantification of Diesel Emissions for the Good Eggs facility at CE-1

In order to determine if the diesel emission reduction actions required by the *Air Quality Plan for Operations of the Good Eggs Facility at the CE-2 Warehouse* will reduce NOx emissions below the Thresholds of Significance specified in the Initial Study/Addendum for development at the Oakland Army Base Project, the emissions associated with operations of the Good Eggs facility was quantified. This quantification of NOx emissions was undertaken in March 2019 using data from Good Eggs on the daily truck and passenger vehicle trips and the CalEEMod 2016.3.2 model and updated in August 2019 to include emissions from Transportation Refrigeration Units (TRU). Specifically, the Good Eggs operations relies mostly on gasoline powered box trucks and vans for incoming deliveries and exclusively with gasoline powered box trucks and vans for outbound deliveries. As such, Good Eggs has approximately 7 daily diesel powered semi- trucks per day at launch (14 two-way trips per day) and approximately 10 diesel powered semitrucks per day at full capacity (20 two-way trips per day). The project is expected to generate 543 two-way trips per day including all trucks, vans, and cars used for incoming and outgoing deliveries and 500 employee trips per day at full operation.

This analysis showed NOx emissions will be 1.14 tons of NOx per year which is well below emissions estimated in 2012 for a transloading warehouse of this size (2.91 tons per year), well below the Threshold of Significance which is 15 tons per year.

Tenant	Size of lease area	Number of daily truck/van/ car delivery trips	Number of daily employee trips	NOx emissions estimated in 2012 for a transloading warehouse of this size (tons/year)	NOx emissions estimated in in 2024 based on Good Eggs use[2] (tons/year)	Threshold of Significance for NOx in tons/year[3]
Good Eggs	116,246	543	500	2.91	1.14	15

As stated in Section 4.6 of the *Air Quality Plan for Operations of the Good Eggs facility at the CE-2 Warehouse* other tenants at the OAB Project will be required to quantify the emissions associated with their operations. These estimates will form a calculation for the cumulative emissions for all permanent projects at the OAB to determine if cumulative emissions stay below the Threshold of Significance. See Section 4.6 for more details.

Toxic Air Contaminants

PM2.5 emissions associated with the trucks serving this facility fall below the individual project threshold of increased cancer rise: less than 10 cases per million, the non-cancer hazard index less than 1.0, and PM2.5 level of less than - 0.3ug/m^3 annual average. As shown in the following table, PM2.5 emissions from the Good Eggs facility in 2022 would not exceed the 1999 BAAQMD threshold.

Tenant	Size of lease area	Motor Vehicle Emissions (tons/year)	TRU Emissions (tons/year)	Total Emissions (tons/year)	Threshold of Significance for PM2.5 in tons/year[3]
Good Eggs	116,246	0.29	0.002	0.29	15

The Air Quality Plan includes two measures to reduce PM2.5 emissions from the project from on site trucks. The first measure requires the loading docks to be electrified so that trucks with TRUs with plug in capability can run their refrigeration systems on electricity instead of using diesel power. TRU PM2.5 emissions are zero when operating on electricity. The loading dock electrification measure would provide a PM emission reduction from TRU use of 0.10 pounds per year in 2022. The second measure provides a commitment to prohibit idling for more than 2 minutes when the trucks are onsite. This provides a 60 percent reduction in idling emissions when compared with compliance with the ARB's idling regulation which limits idling to 5 minutes. This measure would reduce PM2.5 emissions by 0.012 pounds per year. Although the reductions appear small, they provide substantial benefits for people working on or near the loading docks and parked trucks.

[2] Quantification of emissions from diesel trucks serving the Good Eggs facility was done based on data from Good Eggs estimating the daily truck and passenger vehicle trips, and the current California Emissions Model (CalEEMod) 2016.3.2.

[3] Thresholds of Significance are as specified in the 2012 Initial Study/Addendum, pages 132 and 133.

Exhibit B

Quantification of Diesel Emissions for the Good Eggs Facility at Building 2 Warehouse in Oakland, California

Mitchell Air Quality Consulting

August 1, 2019

Patricia McGowen, Environmental Coordinator
City of Oakland, Bureau of Planning
250 Frank H. Ogawa, Suite 3315
Oakland, CA 94612

Subject: **Quantification of Diesel Emissions for the Good Eggs Facility at Building 2 Warehouse in Oakland, California**

Dear Ms. McGowen:

Mitchell Air Quality Consulting (MAQC) prepared a revised assessment to determine the truck and passenger vehicle emissions associated with the Good Eggs Facility in Building 2 including transportation refrigeration units (TRU). The purpose of the assessment is to determine if the diesel emission reduction actions required by the *Air Quality Plan for Operations of the Good Eggs Facility at the Building 2 Warehouse* will reduce NOx emissions below the Thresholds of Significance specified in the Initial Study/Addendum for development at the Oakland Army Base Project. The analysis focuses on oxides of nitrogen (NOx) which exceeded the Bay Area Air Quality Management (BAAQMD) threshold of significance in the 2002 EIR and 2012 IS/Addendum studies. The assessment also quantified $PM_{2.5}$ which is used as a surrogate for diesel particulate matter (DPM). PM_{10} was also provided in the analysis for information only.

Analysis Results

The analysis assessed emissions at three points in time. Good Eggs provided operations estimates for the first year of operation in 2019 reflecting conditions at less than capacity and for 2022 reflecting full capacity. A third model run was prepared for 2024 to match analyses prepared for other Oakland Army Base projects. The analysis showed NOx emissions will be 0.66 tons of NOx per year for the Good Eggs portion of Building 2 in 2019 and 0.84 ton of NOx per year at buildout in 2022. Emissions in 2024 are predicted to decline to 0.68 tons of NOx per year. The project emissions are well below emissions estimated in 2012 for a transloading warehouse of this size, which is 2.91 tons, and well below the Threshold of Significance which is 15 tons per year. The analysis also found that exhaust PM10 emissions including TRUs at maximum operations in 2022 will be 0.017 tons/year, which fall well below the threshold of significance for PM10 of 15 tons/year, and $PM_{2.5}$ emissions will be 0.016 tons/year (there was not a Threshold of Significance for $PM_{2.5}$ applicable to the 2012 project). Although there was not an applicable threshold for $PM_{2.5}$, it should be noted that emissions for $PM_{2.5}$ will not exceed the BAAQMD 2011 $PM_{2.5}$ Threshold of Significance which is 10 tons per year.

The analysis used CalEEMod 2016.3.2 to estimate project emissions with trip generation rates based on information provided by the tenant for daily delivery van and truck trips and numbers of employees that will work at the project site in the first year and at full operations. Good Eggs indicated that at full operation they will generate 10 incoming and 10 outgoing truck semi trips per day, 78 incoming and 78 outgoing trips using gasoline fueled box trucks, and 83 incoming and 83 outgoing trips using gasoline fueled delivery vans. An additional 22 incoming and 22 outgoing trips will be generated from deliveries using passenger cars and

light trucks. The facility is expected to employ a peak of 300 people at full operation which would generate 250 incoming and 250 outgoing trips per day during their commute to work and home assuming an average vehicle ridership of 1.2 people per vehicle. The analysis uses EMFAC 2017 emission factors for the truck emissions using the composite vehicle age distribution and composite speed.

The project will include trucks equipped with transportation refrigeration units (TRU) powered by diesel engines. Good Eggs estimates that half of the semi-trucks and two thirds of the box trucks will be equipped with TRUs. There are a wide variety of TRU designs installed on refrigerated trucks. The most common are powered by a small diesel engine (average is about 34 horsepower (HP) and they operate when the vehicle is parked and when moving. Some configurations use a diesel generator that runs the cooling system with electricity. Some of these systems can plug in at loading docks using grid power to operate the cooling system or they can operate on power from the diesel engine when no plug in is available. The Good Eggs loading docks will have plug in capability, so those trucks would have no TRU emissions while at the loading docks. Some TRUs (mostly small refrigerated box trucks and vans) are powered by the truck engine and do not use an auxiliary diesel TRU engines. Those trucks produce no TRU emissions while driving between destinations. The ARB estimates that approximately 60 percent of semi-trucks are plug-in capable. The analysis assumed that all TRUs would be diesel powered and 60 percent of the semi-trucks would be plugged in at the loading docks. The onsite semi-truck TRU emissions would be reduced by 30 percent based on these assumptions. Over time, more and more TRUs are expected to include plug in capability to take advantage of fuel savings and to comply with regulations.

A TRU emission analysis was prepared for the project for NOx and PM emissions. The analysis uses ARB emission factors for TRUs. The ARB Airborne Toxic Control Measure for in-use Diesel Fueled TRU and TRU Generator Sets, and Facilities Where TRUs Operate requires the retrofit or replacement of all TRUs with units meeting Ultra-Low Emission standards by 2019 (0.02 g/bhp-hr) to reduce diesel particulate matter. This means that all trucks with TRUs accessing the site will meet this standard in 2022. The TRU NOx emission factor used in the analysis is 4.74 g/bhp-hr based on ARB composite offroad emission factors. TRUs for the 2019 model year have an emission factor of 2.72 g/bhp-hr, showing that emissions will decline as newer TRUs replace older higher emitting models. The TRUs are assumed to run 50 percent of the time to maintain the appropriate temperature. The on-road operating time was based on the time to travel the average trip length within the community (CalEEMod default 7.3 miles at 30 mph). The time of TRU operation onsite was estimated at 1 hour per day per TRU based on assumptions use for other projects. A summary of the analysis results for full operation in 2022 is provided in Table 1. The annual NOx emissions for TRU operation were added to the truck emissions shown in Table 2.

The loading dock electrification measure would provide a PM emission reduction from TRU use of 0.06 pounds per year in 2019 and 0.10 pounds per year in 2022. NOx reductions from this measure are 14.65 pounds per year in 2019 and 24.12 pounds per year in 2022.

The project's Air Quality Plan includes a commitment to prohibit idling for more than 2 minutes when the trucks are onsite. This provides a 60 percent reduction in idling emissions when compared with compliance with the ARB's idling regulation which limits idling to 5 minutes. This measure would reduce NOx emissions by 10.18 pounds per year and PM emissions 0.012 pounds per year.

Table 1: Building 2 (Good Eggs Portion) Project TRU Emissions 2022

Source	PM lbs/year	PM (tons/year)	NOx lbs/year	NOx (tons/year)
On Road Use Semis	0.658	0.000	156.6	0.078
On Road Use Box Trucks	1.723	0.001	410.1	0.205
Total On Road TRU Operation	**2.381**	**0.001**	**566.7**	**0.283**
On Site Use Semis	0.338	0.000	80.4	0.040
On Site Use Box Trucks	1.179	0.001	280.6	0.140
Total On Site TRU Operation	**1.517**	**0.001**	**361.0**	**0.181**
Total On Road and On Site 2022	**3.898**	**0.002**	**927.7**	**0.464**

Notes
[1] Modeling assumptions and emission calculations are provided in the attached spreadsheet.

Good Eggs project emissions based on project specific information and the emissions allocated to this building in the 2012 Addendum are shown in the following Table. It is important to note that Good Eggs hopes to transition it internal fleet to electric delivery vehicles by 2021 depending on availability and affordability of appropriate electric vehicles in the marketplace. The reductions in TRU emissions from use of electric plug ins is included in the results.

The project reactive organic gas (ROG) emissions in the 2012 Addendum did not exceed the BAAQMD 1999 threshold (15 tons per year); therefore, the impact was less than significant and no mitigation measures were required to reduce ROG. Modeling results for the Good Eggs project at maximum operations levels in 2022 show that ROG emissions would amount to 0.27 tons per year which is only 1.8 percent of the 1999 threshold.

Table 2: Building 2 (Good Eggs Portion) Project NOx Emissions

Tenant	Lease Area (sf)	Daily Truck and Delivery Van Trips	Daily Employee/ Other Trips	Emissions (tons/year)		
				NO_x (2012 EIR Transload Warehouse	NO_x (2022 Based on Good Eggs Data)	BAAQMD 1999 NOx Threshold
Good Eggs	116,052	343	543	2.91	1.29	15[1]

Notes
[1] Thresholds of Significance are as specified in the 2012 Initial Study/Addendum, pages 132 and 133.
[2] Quantification of emissions from diesel trucks serving the facility uses information provided by Good Eggs including: estimated number of daily truck and passenger vehicle trips, and truck fleet mix for the types of trucks used by the facility. Emissions were calculated using CalEEMod 2016.3.2.

Toxic Air Contaminants

MAQC reviewed the air quality discussion contained in the 2012 IS/Addendum (for the OAB Project) and the 2002 EIR (which analyzed a larger redevelopment project, see Project Description in the 2002 EIR). The health risk discussion in the 2012 IS/Addendum referring to the results of the 2002 EIR assessment indicated that increased cancer risk from emissions for the entire OAB project were 10 in a million at receptor locations in West Oakland and 62 in a million at the property line. The BAAQMD project level threshold of 10 in a million increase in cancer risk applies to the most impacted offsite receptor. The current project no longer includes day care facilities or schools within the project site. The 2012 EIR did not include a receptor location map or an impact contour map to show the location of receptors used to determine the impact. However, the 2012 project is assumed to have included onsite receptors at day care facilities within the Research and Development/Office component that is no longer part of the project. A recreational receptor was also included for people fishing at the waterfront areas, but that receptor is located upwind of the Gateway and City of Oakland Port project area and would receive most of its impacts from ships and trucks loaded at the port. Therefore, the most impacted receptor for the current project would be located in West Oakland approximately 1,500 feet from the project boundary. DPM emissions have dropped substantially since 2002 and the health risk impacts would be proportionally lower with the reduction in DPM emissions. The analysis includes onsite and off-site DPM emissions from trucks equipped with TRUs. The TRUs add about 3.9 pounds per year of DPM at full project operation in 2022. The project onsite emissions are estimated at 1.5 pounds per year, which at 1,500 feet from the receptor would not add significantly to cancer risk in the community because of the effects of dispersion on the pollutant concentrations. The on-road emissions from the project are estimated at 2.4 pounds per day. The on-road emissions would occur along the 7.3 miles traveled for each trip in the community. Therefore, the emissions at any given point along the route would be a small fraction of the total emissions along the travel routes used by the trucks. In addition, except for incoming semi-truck deliveries to the facility, all delivery vans and trucks are gasoline powered and generate no DPM emissions. Therefore, the impacts associated with toxic air contaminants for the Good Eggs use at Building 2 (CE-2) would also fall below the thresholds of significance for toxic air contaminants.

Summary and Conclusion

Project emissions are well below all BAAQMD thresholds of significance for these pollutants. Toxic emissions at the most impacted receptor location is now expected to be less than significant. The project's emissions will continue to decline as fleets serving the project comply with new regulations and adopt new technologies. The project will achieve additional reductions from implementation of onsite measures included in the facility's Air Quality Plan to reduce idling beyond ARB regulation from 5 minutes to 2 minutes and to install electric plug-ins at loading docks to reduce TRU use. The reduced idling measure provides a 60 percent reduction in idling emissions. The loading dock electrification measure reduces semi-truck TRU use by 30 percent.

If you have any questions regarding this analysis, please call me at (559) 246-3732, or via email at dmitchell@mitchellaq.com

Sincerely,

David M. Mitchell

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APPENDIX A: Modeling Assumptions and Results

APPENDIX A: Modeling Assumptions and Results

Good Eggs Warehouse Facility Oakland

2019 Daily Deliveries

Avg Daily Pos	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday	Weekly	ADD	ADT	Fleet Fraction		
Semi	6	8	8	8	8	7	3	**48**	6.86	13.71	0.105	HHD	
Box Truck	15	21	30	29	30	20	7	**152**	21.71	43.43	0.333	LHD1	
Van or Car	32	35	39	40	46	23	13	**228**	32.57	65.14	0.500	LDA/LDT/MDT	One third each
Third Party Carrier	7	1	5	7	6	1	1	**28**	4.00	8.00	0.061	LHD1	
								456	**65.14**	130.29	1		

Expected 2022 Maritime Deliveries

Avg Daily Pos	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday	Weekly	ADD	ADT	Fleet Fraction		
Semi	9	12	12	12	11	11	4	**71**	10.14	20.29	0.139	HHD	
Ice	1	1	1	1	1	1	1	**7**	1.00	2.00	0.014	LHD2	
Box Truck	17	25	35	35	35	24	8	**179**	25.57	51.14	0.350	LHD1	
Van or Car	32	35	39	40	45	23	13	**227**	32.43	64.86	0.443	LDA/LDT/MDT	One third each
Third Party Carrier	7	1	5	7	6	1	1	**28**	4.00	8.00	0.055	LHD1	UPS FedEx
								512	**73.14**	146.29	1.000		

Half of Semis and 2/3 of Box Trucks are Refrigerated
All Box trucks are gasoline fueled
Vans will be gasoline Transit or Sprint Models
Hoping to transition fleet to all electric by 2021

Employee Count Start	50
Peak Empl Count	300

Shipping Trips

	Vans	Box Trucks	Total
2019	14	1	15
2022	24	16	40

Full Operations in 2022

Shipping	Outbound	Return	ADT
Delivery Routes	120	120	240
Vans (60%)	72	72	144
Box Trucks (40%)	48	48	96
			480

Vans and trucks make 3 runs per day

Operations in 2019

Outbound	Return	ADT	
45	45	90	
27	27	54	MDT
18	18	36	LHD1
		180	

Employee Trips

	Employees	AVR	ADT
2022 Employees	300	1.2	500
Good Eggs Bldg	112,501		
Office	2600		
Elec Pump Rest Rooms	951		
Good Eggs Portion	116,052		
Total Bldg SF	232,463		
Truck Trips/Day	146.29		
Employee Trips/Day	500		
Route Trips	240		
Total Trips/Day	886.29		
Trips per KSF	7.64		
HHD Trucks	20.29		20.29
LHD2 Trucks	2.00		2.00
LHD1 Trucks	155.14		155.14
MDT (Vans)	165.60		165.60
Passenger Cars and Lt Trucks	543.23	**Truck Total**	**343.03**
	886.26		
Project Size	116.052		

2022

Truck Fleet Mix for CalEEMod Run						
MDV	**LHD1**	**LHD2**	**MHD**	**HHD**		**Trips/KSF**
0.108244	0.016023	0.005202	0.023981	0.0452	0.19865	
165.60	155.14	2.00	0	20.29	343.03	2.955796
0.482754743	**0.45227725**	**0.00583046**	**0**	**0.059138**	**1**	
Passenger Vehicle Fleet Mix						
LDA	**LDT1**	**LDT2**				
0.560371	0.039285	0.190378	0.790034			
385.3156342	27.0126839	130.905453	543.23			4.680951
0.709299853	**0.04972571**	**0.24097444**	**1**			

Fleet Mix for Single CalEEMod Run

	2022	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Default Fleet Mix	Refrigerated W	0.560371	0.039285	0.190378	0.108244	0.016023	0.005202	0.023981	0.0452	0.002184	0.002561	0.005524	0.000326	0.000721
Fleet Fraction Actual		0.43476602	0.03047942	0.147705512	0.186849763	0.17505348	0.00225667		0.022889					
Estimated Trips		385.32	27.01	130.91	165.60	155.14	2.00		20.29					

LDA	LDT1	LDT2	
0.560371	0.039285	0.190378	0.790034
385.32	27.01	130.91	543.23

2012 Addendum Nox Emissions

	Miles/Trip	Trips/day	Miles	G/Mi	g/day	g/lb	lbs/day	Ton/year
Trucks	7.8	1438	11216.4	7.66	85917.624	453.592	189.416092	24.62409

lbs/day	189.4
g/mi	7.66
g/day	85910.3248
mi/day	11215.4471
Trips	1438
mi/trip	7.79933734

2019 Model Run Assumptions

		Trips/Ksf
Employees	40	
Daily Emp Trips (1.2 AVR)	66.66666667	0.57445513

Truck Trips

	Incoming ADT	Shipping ADT	Totals	Trips/KSF
MDT (Vans)	65.14	54	119.14	
LHD1	51.43	36	87.43	
LHD2	0	0	0	
HHD	13.71	0	13.71	
Total Truck Trips	**130.29**		**220.29**	**1.898163877**

Truck Fleet Mix for CalEEMod Run						
	MDV	LHD1	LHD2	MHD	HHD	
Truck ADT	119.14	87.43	0	0	13.71	220.29
Fleet Fraction for CalEEMod	0.540856031	0.39688716	0	0	0.062256809	1

Passenger Vehicle Fleet Mix					
	LDA	LDT1	LDT2		
Default Leet Mix	0.556416	0.041967	0.190895	0.789278	
Employee Trips	46.99788921	3.54475863	16.12401883	66.66666667	
Fleet Fraction	0.704968338	0.05317138	0.241860282	1	

Idling Emissions T7 Trucks

	2020 Annual	Vehicle Type	Idling	Fuel	NOX (g/hr)	PM10 (g/hr)
Idling Emissions Grams/Hour		T7 Tractor		2020 Diesel	36.9141	0.0436
Idling per vehicle per day (hours)	0.25					

	Trucks/Day	Idling Min/Truck	Idling Hrs/Yr	Nox Emissios (g/yr)	Nox Emissions Lbs/Year	PM Emissions G/Year	PM Emissions lbs/year
Compliance with ARB Idling Reg	6.86	5	208.57	7,699.22	16.97	9.10	0.020
Good Egg AQ Plan Measure	6.86	2	83.46	3,080.97	6.79	3.64	0.008
Emission Reduction					10.18		0.01
Reduction Fraction					0.60		0.60
convert grams to pounds	0.00220462						

Good Egg Modeling Results

	Trucks	Employee	Total
2019 Ops Nox	0.635	0.0226	0.6576
2019 Ops PM10	0.2747	0.0716	0.3463
2019 Ops PM2.5	0.0805	0.0193	0.0998
2022 Ops Nox	0.7067	0.137	0.8437
2022 Ops PM10	0.4302	0.6254	1.0556
2022 Ops PM2.5	0.1259	0.1688	0.2947
2022 Ops ROG	0.1889	0.0823	0.2712
2024 Ops Nox	0.5642	0.1113	0.6755
2024 Ops PM10	0.4289	0.6253	1.0542
2024 Ops PM2.5	0.1246	0.1687	0.2933
2024 Ops ROG	0.1682	0.0823	0.2505

Note: PM2.5 and PM10 results inlcude fugitive dust

TRU Emissions Estimates

Diesel Semi Truck TRU Assumptions

Average HP	36
Average On Time	50%
Load Factor (ARB Offroad TRU)	0.46
ARB PM Standard with ATCM Compliance	0.02 g/bhp-hr
ARB Nox Emission Factor for TRU 2019	4.76 g/bhp-hr
CalEEMod Default Trip Length	7.3 miles
Average Speed over Travel Distance	30 MPH
Time required for 7.3 miles (hrs)	0.243
ADT for HHDT 2019	13.71
ADT for HHDT 2022	20.29
ADT for Box Trucks 2019	43.43
ADT for Box Trucks 2022	53.14

On Road PM	PM (grams/day	PM (lbs/day)	PM lbs/year	PM (tons/year)
Semi TRU PM Emissions 2019	0.553	0.001	0.445	0.000
Semi TRU PM Emissions 2022	0.817	0.002	0.658	0.000
Box Truck Tru PM Emissions 2019	1.750	0.004	1.408	0.001
Box Truck Tru PM Emissions 2022	2.141	0.005	1.723	0.001

convert grams to pounds 0.00220462

PM Emission Calc Formula = HP*%Time Running*load factor*emission factor*hours/trip*avg daily Trips

On Road Nox	NOx (grams/day	NOx (lbs/day)	NOx lbs/year	NOx (tons/year)
Semi TRU Nox Emissions 2019	131.526	0.290	105.837	0.053
Semi TRU NOx Emissions 2022	194.549	0.429	156.551	0.078
	NOx (grams/day	**NOx (lbs/day)**	**NOx lbs/year**	**NOx (tons/year)**
Box Truck TRU Nox Emissions 2019	416.499	0.918	335.151	0.168
Box Truck TRU NOx Emissions 2022	509.664	1.124	410.119	0.205

TRU Onsite Emissions

	2019	Trucks	Trucks w/TRU	TRU Op Time Per Load (hours)	Truck Time at Loading Dock (hours/day)	Total TRU Op Time (hrs/day)
HDT Trucks Per Day		6.16	3.08	0.5	1	1.54
Box Trucks		21.71	14.45886	0.5	1	7.23

	2022	Trucks	Trucks w/TRU	TRU Op Time Per Load (hours)	Truck Time at Loading Dock (hours/day)	Total TRU Op Time (hrs/day)
HDT Trucks Per Day		10.14	5.07	0.5	1	2.54
Box Trucks and Ice Truck		26.57	17.70	0.5	1	8.85

Half of HDT trucks have TRUs
2/3 of Box Trucks have TRUs
One hour parked at loading dock per truck
50% TRU Operating Time

On Site PM	PM (grams/day	PM (lbs/day)	PM lbs/year	PM (tons/year)
Semi TRU PM Emission 2019	0.255	0.001	0.205	0.000
Box Truck TRU PM Emissions 2019	1.197	0.003	0.963	0.000
convert grams to pounds	0.00220462			

PM Emission Calc Formula = HP*% Time Running*load factor*emission factor*hours/trip*avg daily Trips

On Site PM	PM (grams/day	PM (lbs/day)	PM lbs/year	PM (tons/year)
Semi TRU PM Emissions 2022	0.420	0.001	0.338	0.000
Box Truck TRU PM Emission Calculation	1.465	0.003	1.179	0.001
convert grams to pounds	0.00220462			

On Site Nox	NOx (grams/day	NOx (lbs/day)	NOx lbs/year	NOx (tons/year)
Semi TRU PM Emissions 2019	60.696	0.134	48.841	0.024
Box Truck TRU PM Emissions 2019	284.932	0.628	229.281	0.115

On Site Nox	NOx (grams/day	NOx (lbs/day)	NOx lbs/year	NOx (tons/year)
Semi TRU PM Emissions 2022	99.911	0.220	80.397	0.040
Box Truck TRU PM Emissions 2022	348.717	0.769	280.608	0.140

Phase in schedule for TRUs meeting the ARB TRU ATCM

Table II-3: ≥25 HP TRU and TRU Gen Set Engines
Proposed In-Use Compliance Dates for In-Use Standards

Engine MY	In-Use Compliance Year '07	'08	'09	'10	'11	'12	'13	'14	'15	'16	'17	'18	'19	'20
'01 & Older		L	L	L	L	L	L	L	U	U	U	U	U	U
'02			L	L	L	L	L	L	L	U	U	U	U	U
'03				U or L	U or L	U or L	U or L	U or L	U or L	U or L	U	U	U	U
'04					U	U	U	U	U	U	U	U	U	U
'05						U	U	U	U	U	U	U	U	U
'06							U	U	U	U	U	U	U	U
'07								U	U	U	U	U	U	U
'08									U	U	U	U	U	U
'09										U	U	U	U	U
'10											U	U	U	U
'11												U	U	U
'12													U	U
'13														U

ARB Initial Statement of Reasons for TRU ATCM 2010
U = Ultralow Emissions Standard of 0.02 g/bhp-hr

TRU Emissions Summary

2019 Emissions	PM lbs/year	PM (tons/year)	NOx lbs/year	NOx (tons/year)
On Road Use Semis	0.445	0.000	105.8	0.053
On Road Use Box Trucks	1.408	0.001	156.6	0.078
Total Onroad	**1.853**	**0.001**	**262.4**	**0.131**
On Site Use Semis	0.205	0.000	48.8	0.024
On Site Use Box Trucks	0.963	0.000	229.3	0.115
Total On Site	**1.169**	**0.001**	**278.1**	**0.139**
Total On Road and On Site 2019	**3.021**	**0.002**	**540.5**	**0.270**

2022 Emissions	PM (lbs/year)	PM (tons/year)	NOx (lbs/year)	NOx (tons/year)
On Road Use Semis	0.658	0.000	156.6	0.078
On Road Use Box Trucks	1.723	0.001	410.1	0.205
Total Onroad	**2.381**	**0.001**	**566.7**	**0.283**
On Site Use Semis	0.338	0.000	80.4	0.040
On Site Use Box Trucks	1.179	0.001	280.6	0.140
Total On Site	**1.517**	**0.001**	**361.0**	**0.181**
Total On Road and On Site 2022	**3.898**	**0.002**	**927.7**	**0.464**

TRU Onsite Mitigation with Electric Plug Ins

	2019	2022
Semi TRUs with Plug-In Capability	60%	60%
Semi Trucks with TRUs	50%	50%
Semi Trucks per Day 2019/2022	6.16	10.14
Semi Trucks with TRUs	3.08	5.07
Semi Trucks with Plug In TRUs	1.848	3.042
Percent Reduction from Plug In	30%	30%

Onsite TRU Emission Reductions

	PM lbs/year Unmitigated	PM lbs/year Mitigated	PM tons/year Mitigated	NOx lbs/year Unmitigated	NOx lbs/year Mitigated	Nox tons/year Mitigated
2019 Semi Trucks	0.205	0.14	0.0001	48.8	34.19	0.0171
Emission Reduction		0.06	0.0000		14.65	0.0073
2022 Semi Trucks	0.338	0.24	0.0001	80.4	56.28	0.0281
Emission Reduction		0.10	0.0001		24.12	0.0121

THERMO KING

Specification Sheet

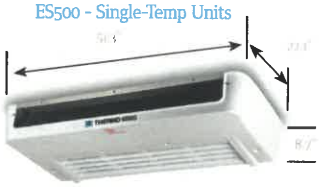
V-520 RT/V-520 RT MAX

Without SmartPower

With SmartPower

ES300 - SPECTRUM Units

ES500 - Single-Temp Units



Thermo King has a Direct Drive unit to meet the needs of your specific application—fresh or frozen!

R-134a Refrigerant for Fresh Applications

- Lower pressure refrigerant means a longer unit lifespan
- More reliable with better temp management for fresh loads

R-404A Refrigerant for Frozen Applications

- Greater cooling capacity
- Better temp management for frozen loads

Unit Features

- Engine-driven compressor
- Modular design system
- SmartPower™ electric standby option
- DSR controller
- Jet Lube compressor lubrication
- Jet Cool compressor injection cooling
- Automatic hot gas defrost
- Optional heating package
- Installation kit

Engine Mounted Compressor

V-520 RT units use a swash plate compressor and it is available with the following belt configurations:

- Double A groove
- Poly V groove

System Performance

V-520 RT Refrigeration Capacity

(System net cooling capacity at 100°F ambient and 2,400 RPM engine operation)

	35°F	0°F
Engine Power Swash Plate (BTU/hr)	12,200	5,000
Engine Power Recip. Comp. (BTU/hr)	13,700	5,410
Smart Power Electric Standby (BTU/hr)	10,000	3,500
Refrigerant		R-134a
Charge		3.5 lbs
Ozone Depletion Potential		Zero
Chlorine		Zero

V-520 RT MAX and V-520 RT SPECTRUM™ Refrigeration Capacity

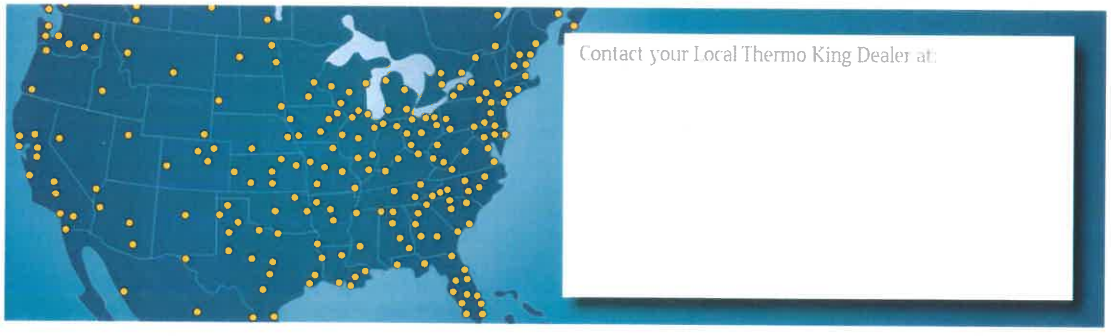
(System net cooling capacity at 100°F ambient and 2,400 RPM engine operation)

	35°F	0°F	-20°F
Engine Power Swash Plate (BTU/hr)	15,500	8,200	5,000
Engine Power Recip. Comp. (BTU/hr)	16,600	8,700	5,300
Smart Power Electric Standby (BTU/hr)	10,400	6,600	3,500
Refrigerant			R-404A
Charge			3.5 lbs

V-520 RT and V-520 RT MAX System Specifications

Evaporator Airflow Capacity	
ES500 (Single Temp)	1,415 cfm
ES300 (Multi Temp)	765 cfm
Electric Standby Option	**Total Current Consumption**
230V/1 Phase/60 Hz	12.7A
230V/3 Phase/60 Hz	14.1A
Hot Gas Heat Option (MAX Only)	
BTU/HR	14,000
System Weight	
V-520 RT Condensing Unit (w/o SmartPower)	101 lbs
V-520 RT Condensing Unit (w/SmartPower)	190 lbs
ES500 Evaporator (Single Temp)	60 lbs
ES300 Evaporator (SPECTRUM Multi Temp [2 req'd])	40 lbs
Swashplate Compressor	16 lbs
Install Kit	10 lbs
Hose Kit	16 lbs

All Thermo King equipment is backed by the Thermo King dealer service network, with over 200 locations across North America.



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