Appendix C

Air Quality and GHG Analysis

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POINT RICHMOND
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MEMORANDUM

DATE:	January 22, 2021
TO:	Clayton Dragoo, Senior Project Engineer, Fisher Construction Group, Inc.
FROM:	Amy Fischer, Principal Cara Carlucci, Senior Planner
SUBJECT:	Air Quality and Greenhouse Gas Analysis for the Proposed Arctic Cold Storage and Packaging Project, Santa Barbara County, California

INTRODUCTION

This Air Quality and Greenhouse Gas Analysis for the proposed Arctic Cold Storage and Packaging Project (project) in the Santa Barbara County (County) has been prepared using methods and assumptions recommended in the Santa Barbara County Air Pollution Control District's (SBCAPCD) *Environmental Review Guidelines*[1] and the County of Santa Barbara Environmental Thresholds and Guidelines Manual[2]. This analysis includes a description of existing regulatory framework, an assessment of project construction and operation-period air quality emissions, and an assessment of greenhouse gas (GHG) emissions. Measures to reduce or eliminate significant impacts are identified, where appropriate.

PROJECT DESCRIPTION

The proposed project is located at 1750 E. Betteravia Road near Santa Maria in Northern Santa Barbara County, California. The project site currently consists of two existing buildings and vacant land. The project site is bound to the north by Betteravia Road, to the east by Prell Road, to the south by industrial uses and vacant land, and to the west by Rosemary Road. Figures 1 and 2 (Attachment A) provide the regional and local proximity locations for the project site, respectively.

The proposed project would include a 436,647-square-foot freezer/processer facility (449,248 square feet of gross floor area). Figure 3 (Attachment A) shows the proposed project's site plan. Processor operations would consist of receiving produce from local growers on flatbed trucks and from refrigerated trucks from other regions throughout California and Baja. Produce would be received, weighed, and then then staged into the cooler or staging area for processing. Once

1 Santa Barbara County Air Pollution Control District, 2015. *Environmental Review Guidelines for the Santa Barbara County Air Pollution Control District*. April 30. Website: www.ourair.org/wp-content/uploads/APCDCEQAGuidelinesApr2015.pdf (accessed March 2020).

2 County of Santa Barbara, 2020. *Environmental Thresholds and Guidelines Manual*. September. Website: https://cosantabarbara.app.box.com/s/vtxutffe2n52jme97lgmv66os7pp3lm5 (accessed October 2020).

processed, the finished product would be packaged and conveyed to the attached cold storage for blast freezing and storage until ready to ship out by the customer.

Freezer operations would consist of a cold distribution warehouse. Once products are received on temperature-controlled docks via tractor trailer or container, the products would be entered into a computerized warehouse management system (WMS) then determined whether to be placed in cold room storage or blast freezers for additional temperature reductions specified by customers. Products would be stored in cold rooms of 0° or below electronically monitored by refrigeration software until shipped out via tractor trailer or container throughout the United States.

During peak harvest season (May through September), operation of the proposed project is expected to generate approximately 1,380 average daily trips, with 1,168 employee trips and 212 truck trips.[3] During the non-harvest season, the proposed project is expected to generate approximately 384 average daily trips, with 284 employee trips and 100 truck trips. In addition, the estimated potential increased electricity demand associated with operation of the proposed project is approximately 35,535,000 kilowatt-hours (kWh) per year. Most of the equipment used for operation of the proposed project would be electric driven. The proposed project would utilize four propone forklifts, five boilers, and diesel fire pumps. The proposed project would not add carbon dioxide to any of the operations within the facility and would not use generators.

Construction of the proposed project would begin January 18, 2021 and end February 2, 2022. The proposed would include 64,876 cubic yards of cut and 50,311 cubic yards of fill, and would result in approximately 14,565 cubic yards of net cut.

ENVIRONMENTAL SETTING

Air Quality Background

Both State and Federal governments have established health-based Ambient Air Quality Standards for six criteria air pollutants:[4] carbon monoxide (CO), ozone (O_3), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), lead (Pb), and suspended particulate matter (PM). In addition, the State has set standards for sulfates, hydrogen sulfide, vinyl chloride and visibility-reducing particles. These standards are designed to protect the health and welfare of the populace with a reasonable margin of safety. Long-term exposure to elevated levels of criteria pollutants may result in adverse health effects. However, emission thresholds established by an air district are used to manage total regional emissions within an air basin based on the air basin's attainment status for criteria pollutants. These emission thresholds were established for individual projects that would contribute to regional emissions and pollutant concentrations and could adversely affect or delay the projected attainment target year for certain criteria pollutants.

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3 Associated Transportation Engineers, 2020. *Traffic and Circulation Study for the Arctic Cold Storage & Packing Project*.

4 United States Environmental Protection Agency (USEPA), 2014. Criteria pollutants are defined as those pollutants for which the Federal and State governments have established ambient air quality standards, or criteria, for outdoor concentrations in order to protect public health.

Because of the conservative nature of the thresholds and the basin-wide context of individual project emissions, there is no direct correlation between a single project and localized air quality-related health effects. One individual project that generates emissions exceeding a threshold does not necessarily result in adverse health effects for residents in the project vicinity. This condition is especially true when the criteria pollutants exceeding thresholds are those with regional effects, such as ozone precursors like nitrogen oxides (NO_x) and reactive organic compounds (ROC).

Occupants of facilities such as schools, daycare centers, parks and playgrounds, hospitals, and nursing and convalescent homes are considered to be more sensitive than the general public to air pollutants because these population groups have increased susceptibility to respiratory disease. Persons engaged in strenuous work or exercise also have increased sensitivity to poor air quality. Residential areas are considered more sensitive to air quality conditions, compared to commercial and industrial areas, because people generally spend longer periods of time at their residences, with greater associated exposure to ambient air quality conditions. Recreational uses are also considered sensitive compared to commercial and industrial uses due to greater exposure to ambient air quality conditions associated with exercise.

Air quality monitoring stations are located throughout the nation and maintained by the local air districts and State air quality regulating agencies. Data collected at permanent monitoring stations are used by the USEPA to identify regions as “attainment” or “nonattainment” depending on whether the regions meet the requirements stated in the applicable National Air Quality Standards (NAAQS). Nonattainment areas are imposed with additional restrictions as required by the USEPA. In addition, different classifications of attainment, such as marginal, moderate, serious, severe, and extreme, are used to classify each air basin in the State on a pollutant-by-pollutant basis. The classifications are used as a foundation to create air quality management strategies to improve air quality and comply with the NAAQS.

The California Air Resources Board (CARB) has divided California into 15 regional air basins according to topographic drainage features, geographic features, and meteorological features for the purpose of managing the air resources of the State on a regional basis. Each air district establishes significance thresholds, which are used to manage total regional and local emissions within an air basin. Significance thresholds are based on whether or not the air basin has met State and federal ambient air quality standards (AAQS) for criteria pollutants. These emission thresholds were established for individual development projects that would contribute to regional and local emissions and could adversely affect or delay the Air Basin’s projected attainment target goals for nonattainment criteria pollutants.

Santa Barbara County is within the South Central Coast Air Basin (SCCAB), which includes all of San Luis Obispo, Santa Barbara, and Ventura counties. The SCCAB is comprised of three air pollution control districts (APCDs) which are county governing authorities that have primary responsibility for controlling air pollution from stationary sources within their jurisdiction. The three APCDs within the SCCAB include the San Luis Obispo County APCD, which consists of San Luis Obispo County; the Santa Barbara County APCD (SBCAPCD), which consists of Santa Barbara County; and the Ventura County APCD, which consists of Ventura County. Santa Barbara County, therefore, is within the jurisdiction of the SBCAPCD.

The attainment statuses for each of the criteria pollutants for the SBCAPCD are listed in Table A.

Table A: Santa Barbara County Attainment/Nonattainment Classification Summary

Pollutant	Averaging Time	California Standards		National Standards	
		Concentration	Attainment Status	Concentration	Attainment Status
Ozone	8 hour	0.070 ppm	Nonattainment-Transitional	0.070 ppm	Unclassifiable/ Attainment
	1 hour	0.09 ppm (180 μg/m^3)	Nonattainment-Transitional	-	-
Carbon Monoxide	8 hour	9.0 ppm (10 mg/m^3)	Attainment	9.0 ppm (10 m/m^3)	Attainment
	1 hour	20.0 ppm (23 mg/m^3)	Attainment	35.0 ppm (40 μg/m^3)	Attainment
Nitrogen Dioxide	annual average	0.030 ppm (56 μg/m^3)	Attainment	53 ppb	Unclassifiable/ Attainment
	1 hour	0.18 ppm (338 μg/m^3)	Attainment	100 ppb	Unclassifiable/ Attainment
Sulfur Dioxide	annual average	-	-	Revoked	-
	24 hour	0.04 ppm (105 μg/m^3)	Attainment	Revoked	-
	1 hour	0.25 ppm (655 μg/m^3)	Attainment	75 ppb	Attainment
Particulate Matter (PM_{10})	annual arithmetic mean	20 μg/m^3	Nonattainment	Revoked	Attainment
	24 hour	50 μg/m^3	Nonattainment	150 μg/m^3	Attainment
Particulate Matter ($PM_{2.5}$)	annual arithmetic mean	12μg/m^3	Unclassifiable	12.0 μg/m^3	Unclassifiable/ Attainment
	24 hour	-	-	35 μg/m^3	Unclassifiable/ Attainment
Sulfates	24 hour	25 μg/m^3	Attainment	-	-
Lead	calendar quarter	-	-	1.5 μg/m^3	Attainment
	30 day average	1.5 μg/m^3	Attainment	-	-
	rolling 3-month average	-	-	0.15 μg/m^3	Unclassifiable
Hydrogen Sulfide	1 hour	0.03 ppm (42 μg/m^3)	Attainment	-	-
Vinyl Chloride (chloroethene)	24 hour	0.010 ppm (26 μg/m^3)	Attainment	-	-
Visibility Reducing Particles	8 hour (1000 to 1800 PST)	-	-	-	-

Source: SBCAPCD (2019). Website: www.ourair.org/air-quality-standards/

The primary pollutants of concern in the SBCAPCD are O_3 and PM_{10} as the SBCAPCD is designated as nonattainment under State AAQS standards for these pollutants. However, in 2017 the SBCAPCD changed from nonattainment to nonattainment-transitional for O_3 due to the declining number of

State 1-hour and 8-hour O_3 exceedances that have occurred in the County between 1990 and 2005.[5] The SBCAPCD is either in attainment or unclassified for all other State and federal standards.[6]

Pollutant monitoring results for the years 2016 to 2018 at the Santa Maria ambient air quality monitoring station (the closest monitoring station to the project site) indicate that air quality in the project area has generally been good, with the exception of PM. The monitoring results indicated $PM_{2.5}$ levels exceeded the federal standard once in 2018; however the federal $PM_{2.5}$ standards were not exceeded in 2016 or 2017. PM_{10} levels exceeded the State standard 16 times in 2016, 22 times in 2017, and 13 times in 2018; however the federal PM_{10} standards were not exceeded between 2016 and 2018. Both State and federal 1-hour ozone standards were not exceeded between 2016 and 2018, and the federal 8-hour ozone standards were not exceeded between 2016 and 2018 at this monitoring station. The CO, SO_2, and NO_2 standards were also not exceeded in this area between 2016 and 2018.

Greenhouse Gas and Global Climate Change Background

Greenhouse gases (GHGs) are present in the atmosphere naturally, are released by natural sources, or are formed from secondary reactions taking place in the atmosphere. The gases that are widely seen as the principal contributors to human-induced global climate change are:

- Carbon dioxide (CO_2);
- Methane (CH_4);
- Nitrous oxide (N_2O);
- Hydrofluorocarbons (HFCs);
- Perfluorocarbons (PFCs); and
- Sulfur Hexafluoride (SF_6).

Over the last 200 years, humans have caused substantial quantities of GHGs to be released into the atmosphere. These extra emissions are increasing GHG concentrations in the atmosphere and enhancing the natural greenhouse effect, which is believed to be causing global warming. While manmade GHGs include naturally-occurring GHGs such as CO_2, CH_4, and N_2O, some gases, like HFCs, PFCs, and SF_6 are completely new to the atmosphere.

Certain gases, such as water vapor, are short-lived in the atmosphere. Others remain in the atmosphere for significant periods of time, contributing to climate change in the long term. Water vapor is excluded from the list of GHGs above because it is short-lived in the atmosphere and its

5 SBCAPCD, 2016. *2016 Ozone Plan*. October.

6 A region is determined to be unclassified when the data collected from the air quality monitoring stations do not support a designation of attainment or nonattainment, due to lack of information, or a conclusion cannot be made with the available data.

atmospheric concentrations are largely determined by natural processes, such as oceanic evaporation.

These gases vary considerably in terms of Global Warming Potential (GWP), which is a concept developed to compare the ability of each GHG to trap heat in the atmosphere relative to another gas. The GWP is based on several factors, including the relative effectiveness of a gas to absorb infrared radiation and length of time that the gas remains in the atmosphere ("atmospheric lifetime"). The GWP of each gas is measured relative to CO_2, the most abundant GHG; the definition of GWP for a particular GHG is the ratio of heat trapped by one unit mass of the GHG to the ratio of heat trapped by one unit mass of CO_2 over a specified time period. GHG emissions are typically measured in terms of pounds or tons of "CO_2 equivalents" (CO_2e).

Regulatory Framework

Air quality and GHG standards and the regulatory framework are discussed below.

Federal Regulations

At the federal level, the USEPA has been charged with implementing national air quality programs. USEPA air quality mandates are drawn primarily from the Federal Clean Air Act (FCAA), which was enacted in 1963. The FCAA was amended in 1970, 1977, and 1990.

The United States has historically had a voluntary approach to reducing GHG emissions. However, on April 2, 2007, the United States Supreme Court ruled that the USEPA has the authority to regulate CO_2 emissions under the federal Clean Air Act. While there currently are no adopted federal regulations for the control or reduction of GHG emissions, the USEPA commenced several actions in 2009 to implement a regulatory approach to global climate change. This includes the 2009 USEPA final rule for mandatory reporting of GHGs from large GHG emission sources in the United States. Additionally, the USEPA Administrator signed an endangerment finding action in 2009 under the Clean Air Act, finding that six GHGs (CO_2, CH_4, N_2O, HFCs, PFCs, SF_6) constitute a threat to public health and welfare, and that the combined emissions from motor vehicles cause and contribute to global climate change, leading to national GHG emission standards.

California Air Resources Board

The CARB is the State's "clean air agency." The CARB's goals are to attain and maintain healthy air quality, protect the public from exposure to toxic air contaminants, and oversee compliance with air pollution rules and regulations. CARB is also the lead agency for implementing climate change regulations in the State. Since its formation, the CARB has worked with the public, the business sector, and local governments to find solutions to California's air pollution problems. Key efforts by the State are described below.

Assembly Bill 2588 Air Toxics "Hot Spots" Information and Assessment Act. Under Assembly Bill (AB) 2588, stationary sources of air pollutants are required to report the types and quantities of certain substances their facilities routinely released into the air. The goals of the Air Toxics "Hot Spots" Act are to collect emission data, identify facilities having localized impacts, determine health risks, and notify nearby residents of significant risks.

The California Air Resources Board Handbook. The CARB has developed an Air Quality and Land Use Handbook[7], which is intended to serve as a general reference guide for evaluating and reducing air pollution impacts associated with new projects that go through the land use decision-making process. According to the CARB Handbook, recent air pollution studies have shown an association between respiratory and other non-cancer health effects and proximity to high traffic roadways. Other studies have shown that diesel exhaust and other cancer-causing chemicals emitted from cars and trucks are responsible for much of the overall cancer risk from airborne toxics in California. The CARB Handbook recommends that county and city planning agencies strongly consider proximity to these sources when finding new locations for "sensitive" land uses such as homes, medical facilities, daycare centers, schools, and playgrounds.

Land use designations with air pollution sources of concern include freeways, rail yards, ports, refineries, distribution centers, chrome plating facilities, dry cleaners, and large gasoline service stations. Key recommendations in the CARB Handbook include taking steps to avoid siting new, sensitive land uses:

- Within 500 feet of a freeway, urban roads with 100,000 vehicles/day or rural roads with 50,000 vehicles/day;
- Within 1,000 feet of a major service and maintenance rail yard;
- Immediately downwind of ports (in the most heavily impacted zones) and petroleum refineries;
- Within 300 feet of any dry cleaning operation (for operations with two or more machines, provide 500 feet); and
- Within 300 feet of a large gas station (defined as a facility with a throughput of 3.6 million gallons per year or greater).

The CARB Handbook specifically states that its recommendations are advisory and acknowledges land use agencies have to balance other considerations, including housing and transportation needs, economic development priorities, and other quality of life issues.

The recommendations are generalized and do not consider site-specific meteorology, freeway truck percentages, or other factors that influence risk for a particular project site. The purpose of this guidance is to further examine project sites for actual health risk associated with the location of new sensitive land uses.

Assembly Bill 32 (2006), California Global Warming Solutions Act. California's major initiative for reducing GHG emissions is Assembly Bill (AB) 32, passed by the State legislature on August 31, 2006. This effort aims at reducing GHG emissions to 1990 levels by 2020. The CARB has established the level of GHG emissions in 1990 at 427 million metric tons (MMT) CO_2e. The emissions target of 427 MMT requires the reduction of 169 MMT from the State's projected business-as-usual 2020 emissions of 596 MMT. AB 32 requires the CARB to prepare a Scoping Plan that outlines the main

7 CARB. 2005. *Air Quality and Land Use Handbook: A Community Health Perspective.* April.

State strategies for meeting the 2020 deadline and to reduce GHGs that contribute to global climate change. The Scoping Plan was approved by the CARB on December 11, 2008, and contains the main strategies California will implement to achieve the reduction of approximately 169 MMT of CO_2e, or approximately 30 percent, from the State's projected 2020 emission level of 596 MMT of CO_2e under a business-as-usual scenario (this is a reduction of 42 MMT CO_2e, or almost 10 percent from 2002-2004 average emissions). The Scoping Plan also includes CARB-recommended GHG reductions for each emissions sector of the State's GHG inventory. The Scoping Plan calls for the largest reductions in GHG emissions to be achieved by implementing the following measures and standards:

- Improved emissions standards for light-duty vehicles (estimated reductions of 31.7 MMT CO_2e);
- The Low-Carbon Fuel Standard (15.0 MMT CO_2e);
- Energy efficiency measures in buildings and appliances and the widespread development of combined heat and power systems (26.3 MMT CO_2e); and
- A renewable portfolio standard for electricity production (21.3 MMT CO_2e).

The Scoping Plan identifies 18 emission reduction measures that address cap-and-trade programs, vehicle gas standards, energy efficiency, low carbon fuel standards, renewable energy, regional transportation-related GHG targets, vehicle efficiency measures, goods movement, solar roof programs, industrial emissions, high-speed rail, green building strategies, recycling, sustainable forests, water, and air. The measures would result in a total reduction of 174 MMT CO_2e by 2020.

On August 24, 2011, the CARB unanimously approved both the new supplemental assessment and reapproved its Scoping Plan, which provides the overall roadmap and rule measures to carry out AB 32. The CARB also approved a more robust CEQA equivalent document supporting the supplemental analysis of the cap-and-trade program. The cap-and-trade took effect on January 1, 2012, with an enforceable compliance obligation that began January 1, 2013.

The CARB approved the First Update to the Climate Change Scoping Plan on May 22, 2014. The First Update identifies opportunities to leverage existing and new funds to further drive GHG emission reductions through strategic planning and targeted low carbon investments. The First Update defines CARB climate change priorities until 2020, and sets the groundwork to reach long-term goals set forth in Executive Orders S-3-05 and B-16-2012. The Update highlights California's progress toward meeting the "near-term" 2020 GHG emission reduction goals as defined in the initial Scoping Plan. It also evaluates how to align the State's "longer-term" GHG reduction strategies with other State policy priorities for water, waste, natural resources, clean energy, transportation, and land use. CARB released a second update to the Scoping Plan, the 2017 Scoping Plan,[8] to reflect the 2030 target set by Executive Order B-30-15 and codified by Senate Bill (SB) 32.

Senate Bill 375 (2008). Signed into law on October 1, 2008, SB 375 supplements GHG reductions from new vehicle technology and fuel standards with reductions from more efficient land use patterns and improved transportation. Under the law, the CARB approved GHG reduction targets in

8 California Air Resources Board. 2017. *California's 2017 Climate Change Scoping Plan*. November.

February 2011 for California's 18 federally designated regional planning bodies, known as Metropolitan Planning Organizations (MPOs). The CARB may update the targets every 4 years and must update them every 8 years. MPOs in turn must demonstrate how their plans, policies and transportation investments meet the targets set by the CARB through Sustainable Community Strategies (SCS). The SCS are included with the Regional Transportation Plan (RTP), a report required by State law. However, if an MPO finds that their SCS will not meet the GHG reduction target, they may prepare an Alternative Planning Strategy (APS). The APS identifies the impediments to achieving the targets.

Executive Order B-30-15 (2015). Governor Jerry Brown signed Executive Order B-30-15 on April 29, 2015, which added the immediate target of:

- GHG emissions should be reduced to 40 percent below 1990 levels by 2030.

All State agencies with jurisdiction over sources of GHG emissions were directed to implement measures to achieve reductions of GHG emissions to meet the 2030 and 2050 targets. CARB was directed to update the AB 32 Scoping Plan to reflect the 2030 target, and therefore, is moving forward with the update process. The mid-term target is critical to help frame the suite of policy measures, regulations, planning efforts, and investments in clean technologies and infrastructure needed to continue reducing emissions.

Senate Bill 350 (2015) Clean Energy and Pollution Reduction Act. Senate Bill 350 (SB 350) signed by Governor Jerry Brown on October 7, 2015, updates and enhances AB 32 by introducing the following set of objectives in clean energy, clean air, and pollution reduction for 2030:

- Raise California's renewable portfolio standard from 33 percent to 50 percent; and

- Increasing energy efficiency in buildings by 50 percent by the year 2030.

The 50 percent renewable energy standard will be implemented by the California Public Utilities Commission for the private utilities and by the California Energy Commission for municipal utilities. Each utility must submit a procurement plan showing it will purchase clean energy to displace other non-renewable resources. The 50 percent increase in energy efficiency in buildings must be achieved through the use of existing energy efficiency retrofit funding and regulatory tools already available to State energy agencies under existing law. The addition made by this legislation requires State energy agencies to plan for, and implement those programs in a manner that achieves the energy efficiency target.

Senate Bill 32, California Global Warming Solutions Act of 2016, and Assembly Bill 197. In summer 2016 the Legislature passed, and the Governor signed, SB 32 and AB 197. SB 32 affirms the importance of addressing climate change by codifying into statute the GHG emissions reductions target of at least 40 percent below 1990 levels by 2030 contained in Governor Brown's April 2015 Executive Order B-30-15. SB 32 builds on AB 32 and keeps us on the path toward achieving the State's 2050 objective of reducing emissions to 80 percent below 1990 levels, consistent with an Intergovernmental Panel on Climate Change (IPCC) analysis of the emissions trajectory that would stabilize atmospheric GHG concentrations at 450 parts per million CO_2e and reduce the likelihood of catastrophic impacts from climate change.

The companion bill to SB 32, AB 197, provides additional direction to CARB related to the adoption of strategies to reduce GHG emissions. Additional direction in AB 197 meant to provide easier public access to air emissions data that are collected by CARB was posted in December 2016.

Senate Bill 100. On September 10, 2018, Governor Brown signed SB 100, which raises California's renewable portfolio standard requirements to 60 percent by 2030, with interim targets, and 100 percent by 2045. The bill also establishes a State policy that eligible renewable energy resources and zero-carbon resources supply 100 percent of all retail sales of electricity to California end-use customers and 100 percent of electricity procured to serve all State agencies by December 31, 2045. Under the bill, the State cannot increase carbon emissions elsewhere in the western grid or allow resource shuffling to achieve the 100 percent carbon-free electricity target.

Executive Order B-55-18. Executive Order B-55-18, signed September 10, 2018, sets a goal "to achieve carbon neutrality as soon as possible, and no later than 2045, and achieve and maintain net negative emissions thereafter." Executive Order B-55-18 directs CARB to work with relevant State agencies to ensure future Scoping Plans identify and recommend measures to achieve the carbon neutrality goal. The goal of carbon neutrality by 2045 is in addition to other Statewide goals, meaning not only should emissions be reduced to 80 percent below 1990 levels by 2050, but that, by no later than 2045, the remaining emissions be offset by equivalent net removals of CO_2e from the atmosphere, including through sequestration in forests, soils, and other natural landscapes.

In-Use Off-Road Diesel-Fueled Fleets Regulation. The In-Use Off-Road Diesel-Fueled Fleets Regulation (Off-Road Regulation) applies to all self-propelled off-road diesel vehicles 25 horsepower or greater used in California and most two-engine vehicles (except on-road two-engine sweepers). The goal of the Off-Road Regulation is to reduce PM and NO_x from in-use (existing) off-road heavy-duty vehicles in California. The Off-Road Regulation:

- Imposes limits on idling, requires a written idling policy, and requires a disclosure when selling vehicles;
- Requires all vehicles to be reported to CARB (using the Diesel Off-Road Online Reporting System, [DOORS]) and labeled;
- Restricts the adding of older vehicles into fleets starting on January 1, 2014; and
- Requires fleets to reduce their emissions by retiring, replacing, or repowering older engines or installing Verified Diesel Emission Control Strategies (VDECS) (i.e., exhaust retrofits).

Santa Barbara County Air Pollution Control District

Under the California Clean Air Act (CCAA), the SBCAPCD is required to prepare a plan for air quality improvement for pollutants for which the District is nonattainment. The SBCAPCD updates the plan every three years. Each SBCAPCD Air Quality Attainment Plan (AQAP) is an update of the previous plan and has a 20-year horizon. The latest AQAP is the 2016 Ozone Plan, which was adopted in

October 2016.[9] Based on the region's nonattainment status for ozone, each of the SBCAPCD plan updates have included an "every feasible measure" strategy to ensure continued progress toward attainment of the state ozone standards. The 2016 Ozone Plan documents the SPCAPCD's progress toward the State 1-hour and 8-hour ozone standards.

The 2016 Ozone Plan incorporates and builds upon the prior Clean Air Plans and focuses on achieving attainment of the State ozone standards, in addition to the federal ozone standard. The 2016 Ozone Plan focuses on reducing ozone precursor emissions through implementation of transportation control measures, which would serve to reduce mobile source emissions, which are the primary source of ROC and NO_x emissions in Santa Barbara County. It emphasizes the need for updating emission reduction measures identified in the 2013 Clean Air Plan in order to achieve implementation. In addition, the 2016 Ozone Plan utilizes the Santa Barbara County Association of Governments (SBCAG) Regional Growth Forecast and CARB on-road emissions forecasts to project population growth and associated air pollutant emissions within Santa Barbara County.

When the 2016 Ozone Plan was adopted, the SBCAPCD was still designated as a nonattainment area for the State ozone standard. However, after adoption of the 2016 Ozone Plan, the SBCAPCD's designation for ozone under the CCAA changed from nonattainment to nonattainment-transitional. As a result, the SBCAPCD prepared the August 2017 Report to the District Board of Directors[10] to examine the stationary source control measures in the 2016 Ozone Plan and determine whether changes in the control measure implementation schedule are necessary. The following actions are recommended as an interim strategy, in order to comply with this requirement:

1. Delay implementation of the NO_x control measures until 2018;

2. Shift the ROC control measures to contingency measures; and,

3. Receive and file a preliminary cost-benefit analysis of the NO_x control measures; a complete cost-benefit analysis of the NO_x control measures will be included with the Board action to implement the measures.

In addition, SBCAPCD provides guidance for assessing and reducing the impacts of project-specific air quality emissions in the Environmental Review Guidelines.[11] The Environmental Review Guidelines also developed a GHG threshold of 10,000 metric tons of CO_2e per year for stationary source projects, which include equipment, processes, and operations that require an SBCAPCD permit to operate. However, this threshold does not apply to land development projects. The

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9 Santa Barbara County Air Pollution Control District, 2016. *2016 Ozone Plan*. October 20. Website: www.ourair.org/wp-content/uploads/Final-2016-Ozone-Plan-Approved-October-20-2016.pdf (accessed March 2020).

10 Santa Barbara County Air Pollution Control District, 2017. *Nonattainment-Transitional Designation: Changes to the 2016 Ozone Plan Control Measure Implementation Schedule. August 2017 Report to the District Board of Directors*. Website: www.ourair.org/wp-content/uploads/NA-Trans-Att-B-Justif-Doc.pdf (accessed March 2020).

11 Santa Barbara County Air Pollution Control District, 2015. op. cit.

SBCAPCD has not developed or adopted GHG significance thresholds for residential, commercial, or industrial projects.

Santa Barbara County

The County adopted the Energy and Climate Action Plan (ECAP) in May 2015 to demonstrate the County's commitment to reduce GHG emissions.[12] The ECAP is intended to streamline environmental review of projects within the unincorporated County consistent with the State *CEQA Guidelines* based on statewide emission reduction targets to reduce GHG emissions 15 percent below 2007 emission levels by 2020, consistent with AB 32 and Executive Order S-3-05. In order to achieve these reductions, the ECAP outlines goals, policies, and actions related to community choice energy; sustainable communities strategy; land use design; transportation; built environment; renewable energy; industrial energy efficiency; waste reduction; agriculture; water efficiency; and government operations. For each topic, the ECAP presents strategies to reduce GHG emissions.

Santa Barbara County Association of Governments

The SBCAG adopted the 2040 Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS)[13] in 2017, which responded to the State requirements in Senate Bill 375. The RTP/SCS aims to make land use assumptions and allocate forecast future growth consistent with those assumptions and the allocation of regional housing needs. Starting with land uses allowed by existing, adopted local General Plans, the land use assumptions, developed in close coordination with the planning staff of SBCAG's member jurisdictions, selectively provide for intensification of residential and commercial land uses in urban areas proximate to existing transit. The intent of these changes is ultimately to shorten trip distances and reduce vehicle miles traveled by (1) directly addressing regional jobs/housing imbalance by providing more housing on the jobs-rich South Coast and more jobs in bedroom communities in the North County, and (2) promoting more trips, both local and inter-city, by alternative transportation modes, especially public transit.

THRESHOLDS OF SIGNIFICANCE

The State CEQA Guidelines indicate that a project would normally have a significant adverse air quality impact if project-generated pollutant emissions would:

- Conflict with or obstruct implementation of the applicable air quality plan;
- Result in a cumulatively considerable net increase of any criteria pollutant for which the project is nonattainment under an applicable federal or state ambient air quality standard;
- Expose sensitive receptors to substantial pollutant concentrations; or
- Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people.

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12 Santa Barbara County, 2015. *Energy and Climate Action Plan.* May.

13 Santa Barbara County Association of Governments, 2017. *Fast Forward 2040 SBCAG Regional Transportation Plan and Sustainable Communities Strategy*. August 17.

According to the County of Santa Barbara Environmental Thresholds and Guidelines Manual[14] , a proposed project would not have a significant air quality effect on the environment, if operation of the project would:

- Emit (from all project sources, mobile and stationary) less than the daily trigger[15] for offsets in the APCD New Source Review Rule for any pollutant;
- Emit less than 25 pounds per day of NO_x or ROC from motor vehicle trips only;
- Not cause or contribute to a violation of any California or National Ambient Air Quality Standard (except ozone);
- Not exceed the SBCAPCD health risk public notification thresholds adopted by the SBCAPCD Board; and
- Be consistent with the adopted federal and State air quality plans.

The State *CEQA Guidelines* indicate that a project would normally have a significant adverse greenhouse gas emission impact if the project would:

- Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment; or
- Conflict with an applicable plan, policy or regulation adopted for the purpose of reduction the emissions of greenhouse gases.

The significance of GHG emissions may be evaluated based on locally adopted quantitative thresholds or consistency with a regional GHG reduction plan (such as a Climate Action Plan). As identified above, the County's ECAP is intended to streamline environmental review of projects within the unincorporated County consistent with the State *CEQA Guidelines*; however, the County's ECAP has a 2020 horizon and is based on Statewide emission reduction targets under AB 32 and Executive Order S-3-05. As the proposed project would be operational in 2022, the County's ECAP would not be applicable. The County is currently preparing a 2030 Climate Action Plan consistent with updated Statewide emission reduction targets under SB 32.

Santa Barbara County has developed a GHG threshold of 1,000 metric tons of CO_2e per year for stationary projects, which include equipment, processes, and operations that require an SBCAPCD permit to operate. However, this threshold does not apply to land development projects, but would apply to the projects boilers and fire pump. Neither Santa Barbara County nor SBCAPCD has developed or adopted GHG significance thresholds for residential, commercial, or industrial projects.

14 Ibid., 2.

15 Currently 55 pounds per day for NO_x and ROC, and 80 pounds per day for PM_{10}. Where projects exceed the offset trigger, the significant effect shall be considered mitigable to insignificance where SBCAPCD rules require offsets and net emissions after offsets are less than the trigger for offsets.

IMPACTS AND MITIGATION MEASURES

The proposed project would release emissions over the short term as a result of construction activities, and over the long term from traffic generation and operation of the project. Emissions would include criteria air pollutants and GHG emissions. The sections below describe the proposed project's consistency with applicable air quality plans, estimated project emissions, and the significance of impacts with respect to Santa Barbara County thresholds.

Air Quality Impacts

Consistency with Applicable Air Quality Plans

CEQA requires that proposed projects be analyzed for consistency with the applicable air quality plan. An air quality plan describes air pollution control strategies to be implemented by a city, county, or region classified as a non-attainment area. The main purpose of the air quality plan is to bring the area into compliance with the requirements of the federal and State ambient air quality standards. As discussed above, to bring the SCCAB into attainment for O_3, the SBCAPCD has developed the 2016 Ozone Plan to satisfy Clean Air Act requirements and ensure attainment of the State ozone standard. The SBCAPCD does not have a plan to address PM_{10} attainment.

For a project to be consistent with the SBCAPCD 2016 Ozone Plan, a project's direct and indirect emissions must be consistent with the policies in the 2016 Ozone Plan. Emissions are related to vehicle use, which are directly related to population because additional residents result in more vehicular use. Populations accounted for in the 2016 Ozone Plan and SBCAG forecasts are also accounted for in the SBCAPCD emissions inventories. The proposed project would provide a new cold storage/processing facility. The proposed project does not include residential units and would not increase population projections within the County and, therefore, would be within growth forecast assumptions used in the 2016 Ozone Plan. Therefore, the project would be consistent with the 2016 Ozone Plan, would not conflict with or obstruct the implementation of the applicable air quality plan.

Criteria Pollutant Analysis

The primary pollutants of concern in the project area are O_3 and PM_{10} as the SBCAPCD is designated as nonattainment under State AAQS standards for these pollutants. However, in 2017 the SBCAPCD changed from nonattainment to nonattainment-transitional for O_3 due to the declining number of State 1-hour and 8-hour O_3 exceedances that have occurred in the County between 1990 and 2005.[16] The SBCAPCD is either in attainment or unclassified for all other State and federal standards. The SBCAPCD's nonattainment status is attributed to the region's development history. Past, present, and future development projects contribute to the region's adverse air quality impacts on a cumulative basis. By its very nature, air pollution is largely a cumulative impact. No single project is sufficient in size to, by itself, result in nonattainment of ambient air quality standards. Instead, a project's individual emissions contribute to existing cumulatively significant adverse air quality impacts. If a project's contribution to the cumulative impact is considerable, then the project's impact on air quality would be considered significant.

[16] Ibid., 5.

In developing thresholds of significance for air pollutants, the SBCAPCD and Santa Barbara County considered the emission levels for which a project's individual emissions would be cumulatively considerable. If a project exceeds the identified significance thresholds, its emissions would be cumulatively considerable, resulting in significant adverse air quality impacts to the region's existing air quality conditions. Therefore, additional analysis to assess cumulative impacts is unnecessary. The following analysis assesses the potential project-level construction- and operation-related air quality impacts.

Short-Term Construction Emissions. During construction, short-term degradation of air quality may occur due to the release of particulate emissions generated by site preparation, grading, hauling, and building activities. Emissions from construction equipment are also anticipated and would include CO, NO_x, ROC, directly emitted particulate matter ($PM_{2.5}$ and PM_{10}), and toxic air contaminants (TACs) such as diesel exhaust particulate matter.

Site preparation and project construction would involve grading, paving, and building activities. Construction-related effects on air quality from the proposed project would be greatest during the site preparation phase due to the disturbance of soils. If not properly controlled, these activities would temporarily generate particulate emissions. Sources of fugitive dust would include disturbed soils at the construction site. Unless properly controlled, vehicles leaving the site would deposit dirt and mud on local streets, which could be an additional source of airborne dust after it dries. PM_{10} emissions would vary from day to day, depending on the nature and magnitude of construction activity, local weather conditions, soil moisture, silt content of soil, and wind speed. Larger dust particles would settle near the source, while fine particles would be dispersed over greater distances from the construction site.

Although quantitative thresholds of significance are not currently in place for short-term emissions, CEQA requires that short-term impacts, such as exhaust emissions from construction equipment and fugitive dust generation during grading, be discussed in the environmental document. Therefore, the SBCAPCD and Santa Barbara County recommend that construction-related NO_x, ROC, PM_{10} and $PM_{2.5}$ emissions, from diesel and gasoline powered equipment, paving, and other construction activities, be quantified.

The California Emissions Estimator Model (CalEEMod), Version 2016.3.2, was used to estimate construction emissions for the proposed project. Construction is expected to begin January 18, 2021 and end February 2, 2022. The proposed would include 64,876 cubic yards of cut and 50,311 cubic yards of fill, and would result in approximately 14,565 cubic yards of net cut, which was included in CalEEMod. Other construction details are not yet known; therefore, default assumptions (e.g., construction fleet activities) from CalEEMod were used. CalEEMod output worksheets are included in Attachment B. Results are summarized in Table B below.

Table B: Project Construction Emissions (Tons Per Year)

	CO	NO_x	ROC	SO_x	PM_{10}	$PM_{2.5}$
Year 2021	3.4	4.2	0.4	<0.1	0.5	0.3
Year 2022	0.5	0.4	5.3	<0.1	<0.1	<0.1
Santa Barbara County Significance Threshold	N/A	25.0	25.0	N/A	N/A	N/A
Exceed Threshold?	**No**	**No**	**No**	**No**	**No**	**No**

Source: LSA (January 2021).
Note: N/A = not applicable

As shown in Table B, construction emissions associated with the proposed project would not exceed the SBCACPD's significance thresholds. In addition, the SBCAPCD has established standard measures for reducing fugitive dust emissions (PM_{10} and $PM_{2.5}$) and particulate emissions from diesel exhaust, which are required for all projects that would involve earth-moving activities. For example, the SBCAPCD requires water or other soil stabilizers be used at a project site to control dust. Using water or soil stabilizers can result in fugitive dust emissions reductions of 50 percent or more. Mitigation Measure AQ-1 would require the project contractor to implement the SBCAPCD's standard dust control and equipment exhaust measures to reduce construction fugitive dust.

Mitigation Measure AQ-1: During construction, the project contractor shall implement the following Santa Barbara County Air Pollution Control District (SBCAPCD) standard dust control and equipment exhaust measures:

- During construction, use water trucks or sprinkler systems to keep all areas of vehicle movement damp enough to prevent dust from leaving the site. At a minimum, this should include wetting down such areas in the late morning and after work is completed for the day. Increased watering frequency should be required whenever the wind speed exceeds 15 mph. Reclaimed water should be used whenever possible. However, reclaimed water should not be used in or around crops for human consumption.

- Minimize amount of disturbed area and reduce on site vehicle speeds to 15 miles per hour or less.

- If importation, exportation and stockpiling of fill material is involved, soil stockpiled for more than two days shall be covered, kept moist, or treated with soil binders to prevent dust generation. Trucks transporting fill material to and from the site shall be tarped from the point of origin.

- Gravel pads shall be installed at all access points to prevent tracking of mud onto public roads.

- After clearing, grading, earth moving or excavation is completed, treat the disturbed area by watering, or revegetating, or by spreading soil binders until the area is paved or otherwise developed so that dust generation will not occur.

- The contractor or builder shall designate a person or persons to monitor the dust control program and to order increased watering, as necessary, to prevent transport of dust offsite. Their duties shall include holiday and weekend periods when work may not be in progress. The name and telephone number of such persons shall be provided to the Air Pollution Control District prior to grading/building permit issuance and/or map clearance.

- All portable diesel-powered construction equipment shall be registered with the state's portable equipment registration program OR shall obtain an SBCAPCD permit.

- Fleet owners of mobile construction equipment are subject to the California Air Resource Board (CARB) Regulation for In-Use Off-Road Diesel Vehicles (Title 13, California Code of Regulations (CCR), §2449), the purpose of which is to reduce oxides of nitrogen (NOx), diesel particulate matter (DPM), and other criteria pollutant emissions from in-use off-road diesel-fueled vehicles. Off-road heavy-duty trucks shall comply with the State Off-Road Regulation. For more information, see www.arb.ca.gov/msprog/ordiesel/ordiesel.htm.

- Fleet owners of mobile construction equipment are subject to the CARB Regulation for In-Use (On-Road) Heavy-Duty Diesel-Fueled Vehicles (Title 13, CCR, §2025), the purpose of which is to reduce DPM, NOx and other criteria pollutants from in-use (on-road) diesel-fueled vehicles. On-road heavy-duty trucks shall comply with the State On-Road Regulation. For more information, see www.arb.ca.gov/msprog/onrdiesel/onrdiesel.htm.

- All commercial off-road and on-road diesel vehicles are subject, respectively, to Title 13, CCR, §2449(d)(3) and §2485, limiting engine idling time. Idling of heavy-duty diesel construction equipment and trucks during loading and unloading shall be limited to five minutes; electric auxiliary power units should be used whenever possible.

With implementation of Mitigation Measures AQ-1, construction of the proposed project would not result in a cumulatively considerable net increase of any criteria pollutant for which the project region is in nonattainment under an applicable federal or State AAQS.

Long-Term Operational Emissions. Long-term air pollutant emission impacts are those associated with mobile sources (e.g., vehicle trips), energy sources (e.g., electricity and natural gas), area sources (e.g., architectural coatings and the use of landscape maintenance equipment), off-road sources (e.g., forklifts), stationary sources (e.g., fire pump), and boiler emissions related to the proposed project.

Long-term operation emissions associated with the proposed project were calculated using CalEEMod. For purposes of evaluating the proposed project, the County in CalEEMod was specified as Santa Barbara County - north of Santa Ynez County and the climate zone of four was selected. Based on this climate zone, CalEEMod assumed a wind speed of 3.1 meters per second and precipitation frequency of 37 days per year. The operational year was assumed to be 2022. The utility company for the region was selected as Pacific Gas & Electric Company (PG&E) and the CO_2 intensity was determined to be 328.8 pounds per megawatt hour based on a 5-year average estimated by PG&E.

The CalEEMod analysis assumed 449,248 square feet of refrigerated warehouse-no rail and a 496-space parking lot. In addition, the estimated potential increased electricity demand associated with operation of the proposed project is approximately 35,535,000 kWh per year, which was included in CalEEMod. The proposed project's estimated potential increased water demand of 257.73 acre-feet per year was also included in CalEEMod. Most of the equipment used for operation of the proposed project would be electric driven; however the proposed project would utilize four propane forklifts and diesel fire pumps, which were also included in CalEEMod. The analysis assumes the 351 horsepower (hp) diesel fire pump would be used 2 hours per day and up to 50 hours per year for maintenance and testing, consistent with the default operation limits for SBCACD permitting. Where project-specific data were not available, default assumptions from CalEEMod were used to estimate project emissions. The proposed project would not add carbon dioxide to any of the operations within the facility and would not use generators.

During the peak harvest season (May through September), the proposed project would generate approximately 1,380 average daily trips, with 1,168 employee trips and 212 truck trips. During the non-harvest season, the proposed project is expected to generate approximately 384 average daily trips, with 284 employee trips and 100 truck trips. Mobile source emissions were evaluated based on CARB's 2017 EMFAC web database using vehicle class-specific emissions factors and vehicle miles traveled. Calculation details are shown in Attachment C.

The proposed project would also utilize five boilers to heat water for pasteurizers and evaporators for pasteurized products and puree concentrates. The five boilers would include four 100 hp Miura low-NO_x boilers and one 300 hp Miura low-NO_x boiler. All five boilers would be fueled by natural gas and would have a low NO_x rating as low as 9 parts per million. The four 100 hp Miura low-NO_x boilers would each have a heat input rating of 3,939,000 British thermal units (BTU) and the 300 hp Miura low-NO_x boiler would have a heat input rating of 11,544,000 BTU. The boilers would be used for 24 hours/6 days a week during the peak season (April through October) and 24 hours/5 days a week during the off-season (January through April). Emissions associated with the five boilers were calculated and added to the project operation emissions.

Model results are shown in Table C below. CalEEMod output worksheets are included in Attachment B and the boiler emissions calculations are included in Attachment D.

Table C: Project Operation Emissions (Pounds Per Day)

	CO	NO_x	ROC	SO_x	PM_{10}	$PM_{2.5}$
Mobile Source Emissions	77.3	357.6	23.3	0.8	10.5	15.0
Energy Source Emissions	0.4	0.4	<0.1	<0.1	<0.1	<0.1
Area Source Emissions	0.1	<0.1	12.6	<0.1	<0.1	<0.1
Offroad Emissions	13.8	12.7	1.4	<0.1	0.8	0.8
Stationary Source Emissions	3.0	3.2	1.2	<0.1	0.2	0.2
Boiler Emissions	194.6	7.2	3.5	9.0	4.9	<0.1
Total Project Operation Emissions	**289.2**	**381.1**	**42.0**	**9.8**	**16.4**	**16.0**
Santa Barbara County Mobile Source Significance Threshold	N/A	25.0	25.0	N/A	N/A	N/A
Exceed Threshold?	**N/A**	**Yes**	**No**	**N/A**	**No**	**N/A**
Santa Barbara County All Source Significance Threshold	N/A	55.0	55.0	N/A	80	N/A
Exceed Threshold?	**N/A**	**Yes**	**No**	**N/A**	**No**	**N/A**

Source: LSA (January 2021)
Note: N/A = not applicable

As shown in Table C, project-related long-term air emissions would occur primarily from vehicle trips associated with the proposed project (i.e., mobile source emissions). Project-related long-term air emissions would also occur from the use of electricity and natural gas (i.e., energy source emissions), the use landscape equipment and from the use of consumer products (i.e., area source emissions), the use of the forklifts (off-road emissions), the use of the fire pump system (i.e., stationary source emissions) and the use of the boilers.

PM_{10} emissions result from exhaust produced when a vehicle is running, tire and brake wear, and the entrainment of dust into the atmosphere from vehicles traveling on paved roadways. Entrainment of PM_{10} occurs when vehicle tires pulverize small rocks and pavement and the vehicle movement generate airborne dust. The contribution of tire and brake wear is small compared to the other sources of PM emissions. Gasoline-powered engines have small rates of particulate matter emissions compared with diesel-powered vehicles. In addition, the project would use refrigerated trucks from other regions throughout California and Baja. As indicated in Table C above, the primary emissions generated the proposed project would be associated with mobile source emissions. As shown in Table C, mobile source emissions associated with the project would not exceed the Santa Barbara County's mobile source significance thresholds for ROC; however, mobile source NO_x emissions would be above the Santa Barbara County's threshold.

The mobile source emissions shown in Table C are associated with trip generation estimates during the peak harvest season over the months of May through September. Processor operations would consist of receiving produce from local growers on flatbed trucks and from refrigerated trucks from other regions throughout California and Baja. The outbound semi-trucks would deliver frozen produce to area and regional markets and, at the greatest distance, throughout the nation and to international shipping facilities. This transport is not dependent on harvest seasons and consists of regularly scheduled deliveries anticipated to be up to 30 trucks per day throughout the entire year. Vans would be delivering processed fruits to area markets by demand. As the processor operations would consist of receiving produce from local growers and other regions throughout California and Baja, the Project Applicant would not be able to require truck fleets incorporate zero or near-zero emissions technologies. However, implementation of Mitigation Measure AQ-2 would reduce mobile source NO_x emissions to the extent feasible. In addition, the Project Applicant would be required to comply with CARB's air pollution emission reduction measures for warehouses and distribution centers, including providing infrastructure for zero-emission trucks and transportation refrigeration units (TRU's).

Mitigation Measure AQ-2: The Project Applicant shall implement the following emission reduction measures:

- Use the cleanest technologies available and provide the necessary infrastructure to support zero-emission vehicles and equipment that will be operating on site.
- All loading/unloading docks and trailer spaces shall be equipped with electrical hookups for trucks with transport refrigeration units (TRU) or auxiliary power units. This requirement will substantially decrease the amount of time that a TRU powered by a fossil-fueled internal combustion engine can operate at the project site. Use of zero-emission all-electric plug-in TRUs, hydrogen fuel cell transport refrigeration, and cryogenic transport refrigeration shall be encouraged for operational fleets.[17]
- All TRUs entering the project site be shall plug-in capable.
- Operational fleets shall exclusively use zero-emission light and medium-duty delivery trucks and vans when feasible.
- All heavy-duty trucks entering or on the project site shall be model year 2014 or later, expedite a transition to zero-emission vehicles, and be fully zero-emission beginning in 2030 if feasible.
- The Project Applicant shall be in, and monitor compliance with, all current air quality regulations for on-road trucks including CARB's Heavy-Duty (Tractor-

[17] CARB's technology assessment for transport refrigerators provides information on the current and projected development of TRUs, including current and anticipated costs. The assessment is available at: https://www.arb.ca.gov/msprog/tech/techreport/tru_07292015.pdf.

Trailer) Greenhouse Gas Regulation,[18] Periodic Smoke Inspection Program (PSIP),[19] and the Statewide Truck and Bus Regulation.[20]

- Trucks and support equipment shall be prohibited from idling longer than five minutes while on site.

- On-site TRU diesel engine runtime shall be limited to no longer than 15 minutes.

- Include rooftop solar panels to the extent feasible, with a capacity that matches the maximum allowed for distributed solar connections to the grid.

- Where feasible, install vegetative walls[21] or other effective barriers that separate loading docks and people living or working nearby.

Energy source emissions typically result from activities in buildings for which electricity and natural gas are used. The quantity of emissions is the product of usage intensity (i.e., the amount of electricity or natural gas) and the emission factor of the fuel source. Major sources of energy demand would include the freezer/processer facility and building mechanical systems, such as heating and air conditioning and lighting. As indicated in Table C above, the proposed project would generate minimal energy source emissions and would not exceed Santa Barbara County's significance thresholds.

Typically, area source emissions consist of direct sources of air emissions located at the project site, including architectural coatings and the use of landscape maintenance equipment. Area source emissions associated with the project would include emissions from the use of landscaping equipment and the use of consumer products. As shown in Table C above, the proposed project would generate minimal area source emissions and would not exceed Santa Barbara County's significance thresholds.

[18] In December 2008, CARB adopted a regulation to reduce greenhouse gas emissions by improving the fuel efficiency of heavy-duty tractors that pull 53-foot or longer box-type trailers. The regulation applies primarily to owners of 53-foot or longer box-type trailers, including both dry-van and refrigerated-van trailers, and owners of the heavy-duty tractors that pull them on California highways. CARB's Heavy-Duty (Tractor-Trailer) Greenhouse Gas Regulation is available at: https://www.arb.ca.gov/cc/hdghg/hdghg.htm.

[19] The PSIP program requires that diesel and bus fleet owners conduct annual smoke opacity inspections of their vehicles and repair those with excessive smoke emissions to ensure compliance. CARB's PSIP program is available at: https://www.arb.ca.gov/enf/hdvip/hdvip.htm.

[20] The regulation requires that newer heavier trucks and buses must meet particulate matter filter requirements beginning January 1, 2012. Lighter and older heavier trucks must be replaced starting January 1, 2015. By January 1, 2023, nearly all trucks and buses will need to have 2010 model-year engines or equivalent. CARB's Statewide Truck and Bus Regulation is available at: https://www.arb.ca.gov/msprog/onrdiesel/onrdiesel.htm.

[21] Effectiveness of Sound Wall-Vegetation Combination Barriers as Near-Roadway Pollutant Mitigation Strategies (2017) is available at: https://ww2.arb.ca.gov/sites/default/files/classic//research/apr/past/13-306.pdf.

ROC and NO_x emissions associated with the project would be regional in nature, meaning that the air pollutants are rapidly dispersed on release or, in the case of vehicle emissions associated with the project; emissions are released in other areas of the SCCAB (i.e., vehicles traveling to the project site would release emissions along roadways throughout the SCCAB and not specifically on the project site). The results shown in Table C indicate the project would not exceed the significance criteria for daily ROC, or PM_{10} emissions; however, NO_x emissions would be above the Santa Barbara County threshold. Implementation of Mitigation Measure AQ-2 would reduce mobile source NO_x emissions to the extent feasible; however, NO_x emissions would continue to exceed the Santa Barbara County thresholds. In addition, the Project Applicant would be required to comply with CARB's air pollution emission reduction measures for warehouses and distribution centers, including providing infrastructure for zero-emission trucks and TRU's. Santa Barbara County does not have significance thresholds for CO, SO_x, or $PM_{2.5}$, however as indicated in Table C, the proposed project is not expected to generate substantial CO, SO_x, or $PM_{2.5}$ emissions.

Sensitive Receptors

Sensitive receptors are defined as people that have an increased sensitivity to air pollution or environmental contaminants. Sensitive receptor locations include schools, parks and playgrounds, day care centers, nursing homes, hospitals, and residential dwelling units. The closest sensitive receptors are located more than 2,000 feet from the project site.

Construction activities associated with the proposed project would generate airborne particulates and fugitive dust, as well as a small quantity of pollutants associated with the use of construction equipment (e.g., diesel-fueled vehicles and equipment) on a short-term basis. However, construction contractors would be required to implement measures to reduce or eliminate emissions by implementing Mitigation Measures AQ-1, as described above. Once the project is constructed, the project would include diesel truck traffic associated with loading and unloading of products at the warehouse. However idling of trucks would be limited by the CARB's In-Use Off-Road Diesel Vehicles regulation, which limits idling to 5 minutes or less. The CARB provides analysis of distribution centers, including cold storage facilities, in the document *Air Quality and Land Use Handbook: A Community Health Perspective*.[22] The document includes the recommendation that distribution centers should be located more than 1,000 feet from sensitive land uses. The closest sensitive receptors are located more than 2,000 feet from the project site. Therefore, the siting of the project building is within the CARB's recommended distance and long-term operational emissions would not be expected to impact sensitive receptors.

The closest worker receptors include the agricultural fields located adjacent to the project site along Betteravia Road, approximately 36 meters west of the proposed diesel fire pump, and the closest residential receptor includes the single family residence located along Rosemary Road, approximately 734 meters northeast of the proposed diesel fire pump. However, due to the potential of the diesel fire pump to emit toxic and hazardous air pollutants, a health risk assessment (HRA) was conducted for the nearest worker receptors and an equipment-specific screening-level HRA was prepared for the nearest worker receptors using the SBCAPCD's screening tool spreadsheet

22 California Air Resources Board, 2005. *Air Quality and Land Use Handbook: A Community Health Perspective*. April.

for diesel-fired internal combustion engines (DICE). The HRA uses the 8-hour worker adjustment factor (WAF). The DICE Screening Tool provides an estimate of engine emission concentrations based on project location, meteorological data set, building downwash, engine size, distance from engine source to nearest resident and nearest worker, diesel PM emission factor, and permitted hours. The HRA model snapshots are shown in Attachment E and inputs to the DICE Screening Tool are shown in Attachment F. The receptor locations are also shown in Attachment G. Table D below identifies the results of the HRA.

Table D: Health Risk from Diesel Fire Pump to Nearest Receptor

	Carcinogenic Inhalation Health Risk in One Million	**Chronic Inhalation Hazard Index**
Maximally Exposed Individual Resident	0.5	<0.1
Maximally Exposed Individual Worker	0.3	<0.1
SBCAPCD Significance Threshold	10.0	1.0
Exceed Threshold?	**No**	**No**

Source: LSA (January 2021).

As shown in Table D, the risk associated with the diesel fire pump at the maximally exposed individual resident (MEIR), would be 0.5 in one million and the risk at the maximally exposed individual worker (MEIW), would be 0.3 in one million, which would not exceed the SBCAPCD cancer risk of 10 in one million. The total chronic hazard index would be less than 0.1 for both the MEIR and MEIW, which would also not exceed the threshold of 1.0. Therefore, use of the diesel fire pump would not would not expose nearby sensitive receptors to substantial pollutant concentrations.

In addition, project's role as a shipping facility would increase heavy truck traffic in the immediate project vicinity and along regional hauling routes. The State Office of Environmental Health Hazard Assessment (OEHHA) has determined that long-term exposure to diesel exhaust particulates poses the highest cancer risk of any TAC it has evaluated. Exposure to diesel exhaust can also have immediate health effects. Diesel exhaust can irritate the eyes, nose, throat, and lungs, and it can cause coughs, headaches, lightheadedness, and nausea. In studies with human volunteers, DPM made people with allergies more susceptible to the materials to which they were allergic, such as dust and pollen. Exposure to DPM also causes inflammation in the lungs, which may aggravate chronic respiratory symptoms and increase the frequency or intensity of asthma attacks. For risk assessment procedures, the OEHHA specifies that the surrogate for whole diesel exhaust is DPM.

Improvements over the last 40 years to diesel fuel and diesel engines have resulted in lower emissions of some of these contaminants. These improvements have resulted in a 75 percent reduction in particle emissions from diesel-powered trucks and other equipment as compared to

2000 levels, and by 2020, when fully implemented, would result in an 85 percent reduction.[23] These improvements are anticipated to continue into the foreseeable future.

Project trucks would operate in two modes: stationary idling and moving on and off the site. The emissions from trucks while idling result in a much higher concentration of TACs compared to the emissions from moving trucks. This is due to the dispersion of emissions that occurs with distance and with travel of the vehicle. The proposed project is located more than 2,000 feet from the nearest sensitive receptors; therefore, the proposed project would not result in stationary idling emissions impacts at sensitive receptors. Based on the truck distribution percentage and estimated origin and designation, diesel exhaust associated with moving trucks at any one receptor location would occur for a limited duration. As such, the proposed project is not expected to be a source of substantial emissions.

With implementation of Mitigation Measure AQ-1, sensitive receptors would not be exposed to substantial pollutant concentrations during project construction, and as demonstrated in Table D, operational impacts would also be less than significant.

Objectionable Odors

According to the SBCAPCD, common types of facilities that are known producers of odors include fast food restaurants, bakeries, and coffee roasting facilities. The proposed project would not include any of these types of land uses. The proposed project would generate localized emissions of diesel exhaust during construction equipment operation and truck activity. These emissions may be noticeable from time to time near the project site; however, they would be localized and are not likely to adversely affect people off-site by resulting in confirmed odor complaints. In addition, all food waste would be stored in receptacles and the nearest sensitive receptors are located more than 2,000 feet from the project site. Therefore, the proposed project would not include any sources of significant odors that could cause complaints from surrounding uses. Therefore, the proposed project would not result in other emissions (such as those leading to odors) adversely affecting a substantial number of people.

Greenhouse Gas Impacts

Generate Greenhouse Gas Emissions

The following section describes the proposed project's construction and operational related GHG emissions and contribution to global climate change.

Construction GHG Emissions. Construction activities, such as site preparation, site grading, on-site heavy-duty construction vehicles, equipment hauling materials to and from the project site, and motor vehicles transporting the construction crew would produce combustion emissions from various sources. During construction of the proposed project, GHGs would be emitted through the operation of construction equipment and from worker and builder supply vendor vehicles, each of

[23] California Environmental Protection Agency (CalEPA) Office of Environmental Health Hazard Assessment (OEHHA), and the American Lung Association of California. 2001. *Health Effects of Diesel Exhaust*. May 21. Website: https://oehha.ca.gov/air/health-effects-diesel-exhaust (accessed October 2020).

which typically uses fossil-based fuels to operate. The combustion of fossil-based fuels creates GHGs such as CO_2, CH_4, and N_2O. Furthermore, CH_4 is emitted during the fueling of heavy equipment. Exhaust emissions from on-site construction activities would vary daily as construction activity levels change.

Construction GHG emissions associated with the proposed project were estimated using CalEEMod. CalEEMod output worksheets are included in Attachment B. Based on the CalEEMod results, construction of the proposed project would generate approximately 907.9 metric tons of CO_2e. Neither Santa Barbara County nor the SBCAPCD has developed or adopted a threshold of significance for construction GHG emissions.

Operational GHG Emissions. Long-term operation of the project would generate GHG emissions from mobile, area, off-road, waste, and water sources and indirect emissions from sources associated with energy consumption. Mobile-source GHG emissions would include project-generated vehicle trips to and from the project. Area-source emissions would be associated with activities such as landscaping and maintenance on the project site. Energy source emissions would be generated at off-site utility providers as a result of increased electricity demand generated by the project. Off-road sources include the use of forklifts. Waste source emissions generated by the proposed project include energy generated by land filling and other methods of disposal related to transporting and managing project generated waste. In addition, water source emissions associated with the proposed project are generated by water supply and conveyance, water treatment, water distribution, and wastewater treatment.

Operational emissions associated with area, energy, offroad, waste, and water sources were estimated using CalEEMod and the results are presented in Table E. CalEEMod output worksheets are included in Attachment B. Mobile source emissions were evaluated based on CARB's 2017 EMFAC web database using vehicle class-specific emissions factors and vehicle miles traveled. Calculation details are shown in Attachment C.

Table E: Greenhouse Gas Operational Emissions

Emission Source	Operational GHG Emissions (metric tons/year)			
	CO_2	CH_4	N_2O	CO_2e
Mobile Source Emissions	8,816.4	0.1	1.4	9,224.1
Area Source Emissions	<0.1	<0.1	0.0	<0.1
Energy Source Emissions	5,194.7	0.5	0.1	5,234.3
Offroad Source Emissions	294.1	0.1	0.0	296.5
Waste Source Emissions	87.7	4.3	0.0	196.4
Water Source Emissions	96.8	0.1	0.1	118.9
Total Operational CO_2e Emissions				**15,070.2**

Source: LSA (January 2021).
Notes:
CH_4 = methane
CO_2= carbon dioxide
CO_2e = gross climate change emissions
GHG = greenhouse gas
MT = metric tons

The proposed project would generate approximately 15,070.2 metric tons of CO_2e per year of emissions, as shown in Table E. The majority of the proposed project's GHG emissions are associated with energy and mobile sources. As identified above, neither Santa Barbara County nor SBCAPCD has developed or adopted GHG significance thresholds for development projects. In addition, the State's CEQA Guidelines leaves the determination of the significance of GHG emissions up to the lead agency and authorizes the lead agency to consider thresholds of significance previously adopted or recommended by other public agencies or recommended by experts, provided the decision of the lead agency to adopt such thresholds is supported by substantial evidence (State CEQA Guidelines Sections 15064.4(a) and 15064.7(c)). The State CEQA Guidelines emphasize the lead agency's discretion to determine the appropriate methodologies and thresholds of significance consistent with the manner in which other impact areas are handled in CEQA.[24]

The Governor's Office of Planning and Research's Technical Advisory titled "CEQA and Climate Change: Addressing Climate Change through California Environmental Quality Act Review" states that "public agencies are encouraged but not required to adopt thresholds of significance for environmental impacts. Even in the absence of clearly defined thresholds for GHG emissions, the law requires that such emissions from CEQA projects must be disclosed and mitigated to the extent feasible whenever the lead agency determines that the project contributes to a significant, cumulative climate change impact".[25] Furthermore, the advisory document indicates that "in the absence of regulatory standards for GHG emissions or other scientific data to clearly define what constitutes a 'significant impact,' individual lead agencies may undertake a project-by-project analysis, consistent with available guidance and current CEQA practice."

Because neither Santa Barbara County nor SBCAPCD has developed or adopted numeric or qualitative thresholds of significance for evaluating GHG emissions, this analysis has evaluated the proposed project's GHG emissions using a sector-by-sector (e.g., mobile, area, energy, offroad, waste, and water) basis to determine whether the proposed project's emissions would conflict with applicable sector-specific reduction targets and strategies developed to achieve the State's 2030 target. This methodology is discussed in greater detail below.

Mobile Source Emissions. The California Supreme Court decision on the Newhall Ranch Specific Plan Environmental Impact Report (Center for Biological Diversity v. California Department of Fish and Wildlife, Case # S217763) determined that quantitative goals within regulatory frameworks for the reduction of GHG emissions could be used. The California Supreme Court gave an example of using the per-capita GHG goals of an MPO's SCS in compliance with Senate Bill 375 to determine if a project's on-road vehicle emissions are significant.

The MPO with jurisdiction over the project site is the SBCAG. The SBCAG 2040 RTP/SCS identifies that GHG emissions per capita from passenger vehicles are expected to decrease to 16.28 pounds per day in 2020 and 15.44 pounds per day in 2035 from 2005 base year per capita

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24 California Natural Resources Agency. 2009. California Environmental Quality Act (CEQA) Guidelines Update.

25 California Governor's Office of Planning and Research. 2008. Technical Advisory CEQA and Climate Change: Addressing Climate Change through California Environmental Quality Act Review.

emissions of 18.77 pounds per day, a reduction of 13.3 percent in 2020 and 17.7 percent in 2035. That equates to an emissions rate of 0.007 metric tons of CO_2e per vehicle per day and 2.555 metric tons of CO_2e per vehicle per year in 2035.

During the peak harvest season (May through September), the proposed project would generate approximately 1,380 average daily trips, with 1,168 employee trips and 212 truck trips. During the non-harvest season, the proposed project is expected to generate approximately 384 average daily trips, with 284 employee trips and 100 truck trips. Based on the total annual harvest and non-harvest trips, this analysis assumes an average daily trip rate of 962 average daily trips, resulting in a total of 2,457.9 metric tons of CO_2e annually allowed by the proposed project for passenger cars and light-duty trucks. As shown in Table E, total mobile source emissions for the total operational mobile source emissions would be 9,224.1 metric tons of CO_2e per year. Therefore, the proposed project emissions would exceed the sector-based GHG threshold for on-road vehicle emissions. Implementation of Mitigation Measure AQ-2 would reduce mobile source GHG emissions to the extent feasible. However, as the processor operations would consist of receiving produce from local growers and other regions throughout California and Baja, the Project Applicant would not be able to require truck fleets incorporate zero or near-zero emissions technologies. In addition, the Project Applicant would be required to comply with CARB's air pollution emission reduction measures for warehouses and distribution centers, including providing infrastructure for zero-emission trucks and TRU's. Therefore, mobile source GHG emissions would continue to exceed the sector-based GHG threshold for on-road vehicle emissions.

Area Source Emissions. As identified in Table E, the proposed project would generate minimal area source emissions and would not exceed sector-based GHG thresholds for area emissions.

Energy Source Emissions. The County's ECAP includes measures related to energy use with the goal of increasing energy efficiency and renewable energy. The proposed project would be provided electricity through PG&E. Over 85 percent of PG&E's electricity comes from renewable and GHG-free resources.[26] In addition, consistent with the 2030 Renewable Portfolio Standard mandate set forth by SB 100, PG&E will meet the 60 percent renewable energy goal by 2030. Therefore, the proposed project would meet the sector-based GHG threshold for energy emissions.

Offroad Source Emissions. The SBCAPCD's 2020 Clean Air Grants for Off-Road Equipment Replacement program includes off-road heavy-duty equipment replacement, off-road heavy-duty engine re-power, marine engine repower, and agricultural stationary engine re-power. The replacement of these heavy diesel engines aids in the reduction of air pollution. The proposed project would utilize four propane forklifts. As such, the proposed project would not utilize diesel-powered forklifts and would meet the sector-based GHG threshold for offroad source emissions.

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[26] PG&E, 2020. *Delivering Low-Emission Energy.* Website: https://www.pge.com/en_US/about-pge/environment/what-we-are-doing/clean-energy-solutions/clean-energy-solutions.page?WT.mc_id=Vanity_cleanenergy (accessed October 2020).

Waste Source Emissions. The Santa Barbara County Municipal Code (Chapter 17, Article I, Section 17-12) and AB 939 require the diversion of at least 50 percent of all waste generated, and the County requires 50 percent of all construction and demolition waste to be recycled. The proposed project would comply with the recycling ordinance. Therefore, the proposed project would meet the sector-based GHG threshold for solid waste generation.

Water Source Emissions. The Santa Barbara County 2019 Integrated Regional Water Management (IRWM) Plan[27] includes objectives and strategies to protect and conserve water supplies. Therefore, the water sector threshold is based on the water conservation objectives of the IRWM Plan. The proposed project would be required to comply with the latest Title 24 standards of the California Code of Regulations, which includes a variety of different measures, including reduction of wastewater and water use. In addition, the proposed project would be required to comply with the California Model Water Efficient Landscape Ordinance and would include stormwater retention areas and basins. The proposed project would also result in the removal of approximately 40 acres of agricultural crop production and would therefore result in decreased water demand. Therefore, the proposed project would be below the sector-based GHG threshold for water consumption.

Conclusion. As discussed above, the proposed project would meet the sector-based GHG thresholds for area, energy, offroad, waste, and water source emissions. However, even with implementation of Mitigation Measure AQ-2, mobile source GHG emissions would continue to exceed the sector-based GHG threshold for on-road vehicle emissions. Therefore, operation of the proposed project would result in a significant and unavoidable impact.

Stationary Source GHG Emissions. The proposed project would utilize a diesel fire pump and five boilers to heat water for pasteurizers and evaporators for pasteurized products and puree concentrates. The diesel fire pump was evaluated in the CalEEMod analysis and assumes the 351 hp diesel fire pump would be used 2 hours per day and up to 50 hours per year for maintenance and testing, consistent with the default operation limits for SBCAPCD permitting. Emissions associated with the five boilers were also calculated and are included in Attachment D. The five boilers would include four 100 hp Miura low-NO_x boilers and one 300 hp Miura low-NO_x boiler. All five boilers would be fueled by natural gas and would have a low NO_x rating as low as 9 parts per million. The four 100 hp Miura low-NO_x boilers would each have a heat input rating of 3,939,000 BTU and the 300 hp Miura low-NO_x boiler would have a heat input rating of 11,544,000 BTU. The boilers would be used for 24 hours/6 days a week during the peak season (April through October) and 24 hours/5 days a week during the off-season (January through April).

Emissions associated with the diesel fire pump and five boilers were are shown in Table F below.

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27 Santa Barbara County, 2019. *Integrated Regional Water Management Plan Update 2019*. Website: http://www.countyofsb.org/uploadedFiles/pwd/Content/Water/IRWMP/IRWM-PLAN-UPDATE-Final_MASTER.pdf (accessed October 2020).

Table F: Stationary Source Greenhouse Gas Emissions

Emission Source	Operational GHG Emissions (metric tons/year)
	CO_2e
Diesel Fire Pump Emissions	6.7
Boiler Emissions	12,756.9
Total Stationary Source CO_2e Emissions	**12,763.6**

Source: LSA (January 2021).
Notes:
CH_4 = methane
CO_2= carbon dioxide
CO_2e = gross climate change emissions
GHG = greenhouse gas
MT = metric tons

As discussed above, Santa Barbara County has developed a GHG threshold of 1,000 metric tons of CO_2e per year for stationary projects, which include equipment, processes, and operations that require an SBCAPCD permit to operate. Emissions associated with the diesel fire pump and five boilers would generate approximately 12,763.6 metric tons of CO_2e per year, which would exceed the County's stationary source threshold, resulting in a significant impact. The proposed fire pumps would utilize the newest available technology and would be more efficient than older equipment. In addition, the five boilers would be fueled by natural gas, which is more efficient and would result in fewer emissions than liquefied petroleum gas. Given this equipment would use the latest and cleanest technology available, there are no mitigation measures to reduce this impact. Therefore, stationary source GHG emissions associated with the project would be significant and unavoidable.

Consistency with Greenhouse Gas Reduction Plans

As identified above, the County's ECAP is intended to streamline environmental review of projects within the unincorporated County consistent with the State *CEQA Guidelines*; however the County's ECAP has a 2020 horizon and is based on Statewide emission reduction targets under AB 32 and Executive Order S-3-05. As the proposed project would be operational in 2022, the County's ECAP would not be applicable. The County is currently preparing a 2030 Climate Action Plan consistent with updated Statewide emission reduction targets under SB 32. In addition, neither Santa Barbara County nor SBCAPCD has developed or adopted GHG significance thresholds for commercial or industrial projects.

The SBCAG has incorporated a sustainable community strategy into its 2040 RTP/SCS plan, which is designed to help the region achieve its SB 375 GHG emissions reduction target. The SBCAG 2040 RTP/SCS demonstrates that the SBCAG region would achieve its regional emissions reduction targets for the 2020 and 2035 target years. The RTP/SCS sets forth goals and objectives related to mixed-use development and the jobs-housing balance. The RTP/SCS seeks to address the jobs/housing balance directly by allotting more jobs to the North County. The proposed project would not include residential units and therefore would not increase population projections. In addition, the proposed project would create job opportunities within the County to increase the jobs-housing ratio. Therefore, the proposed project would be consistent with the goals of the SBCAG 2040 RTP/SCS.

Absent any other local or regional climate action plan, the proposed project was analyzed for consistency with the CARB Scoping Plan measures, including the following. The following discussion evaluates the proposed project according to the goals of AB 32, the AB 32 Scoping Plan, Executive Order B-30-15, SB 32, and AB 197.

AB 32 is aimed at reducing GHG emissions to 1990 levels by 2020. AB 32 requires the CARB to prepare a Scoping Plan that outlines the main State strategies for meeting the 2020 deadline and to reduce GHGs that contribute to global climate change. The AB 32 Scoping Plan has a range of GHG reduction actions, which include direct regulations, alternative compliance mechanisms, monetary and non-monetary incentives, voluntary actions, market-based mechanisms such as a cap-and-trade system, and an AB 32 implementation fee to fund the program.

Executive Order Executive Order B-30-15 added the immediate target of reducing GHG emissions to 40 percent below 1990 levels by 2030. CARB released a second update to the Scoping Plan, the 2017 Scoping Plan,[28] to reflect the 2030 target set by Executive Order B-30-15 and codified by SB 32. SB 32 affirms the importance of addressing climate change by codifying into statute the GHG emissions reductions target of at least 40 percent below 1990 levels by 2030 contained in Executive Order B-30-15. SB 32 builds on AB 32 and keeps us on the path toward achieving the State's 2050 objective of reducing emissions to 80 percent below 1990 levels. The companion bill to SB 32, AB 197, provides additional direction to the CARB related to the adoption of strategies to reduce GHG emissions. Additional direction in AB 197 intended to provide easier public access to air emissions data that are collected by CARB was posted in December 2016.

As identified above, the AB 32 Scoping Plan contains GHG reduction measures that work towards reducing GHG emissions, consistent with the targets set by AB 32, Executive Order B-30-15 and codified by SB 32 and AB 197. The measures applicable to the proposed project include energy efficiency measures, water conservation and efficiency measures, and transportation and motor vehicle measures, as discussed below.

Energy efficient measures are intended to maximize energy efficiency building and appliance standards, pursue additional efficiency efforts including new technologies and new policy and implementation mechanisms, and pursue comparable investment in energy efficiency from all retail providers of electricity in California. In addition, these measures are designed to expand the use of green building practices to reduce the carbon footprint of California's new and existing inventory of buildings. As identified above, the proposed project would comply with the latest Title 24 standards of the California Code of Regulations, regarding energy conservation and green building standards. Therefore, the proposed project would comply with applicable energy measures.

Water conservation and efficiency measures are intended to continue efficiency programs and use cleaner energy sources to move and treat water. Increasing the efficiency of water transport and reducing water use would reduce GHG emissions. As noted above, the project would be required to comply with the latest Title 24 standards of the California Code of Regulations, which includes a variety of different measures, including reduction of wastewater and water use. In addition, the proposed project would be required to comply with the California Model Water Efficient Landscape

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[28] California Air Resources Board. 2017. *California's 2017 Climate Change Scoping Plan*. November.

Ordinance and would include stormwater retention areas and basins. Therefore, the proposed project would not conflict with any of the water conservation and efficiency measures.

The goal of transportation and motor vehicle measures is to develop regional GHG emissions reduction targets for passenger vehicles. Specific regional emission targets for transportation emissions would not directly apply to the proposed project. However, vehicles traveling to the project site would comply with the Pavley II (LEV III) Advanced Clean Cars Program. The second phase of Pavley standards will reduce GHG emissions from new cars by 34 percent from 2016 levels by 2025, resulting in a 3 percent decrease in average vehicle emissions for all vehicles by 2020. Vehicles traveling to the project site would comply with the Pavley II (LEV III) Advanced Clean Cars Program. Therefore, the proposed project would not conflict with the identified transportation and motor vehicle measures.

The proposed project would comply with existing State regulations adopted to achieve the overall GHG emissions reduction goals identified in AB 32, the AB 32 Scoping Plan, Executive Order B-30-15, SB 32, and AB 197 and would be consistent with applicable State plans and programs designed to reduce GHG emissions. Therefore, the proposed project would not conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of GHGs.

CONCLUSION

Based on the analysis presented above, construction of the proposed project would not result in the generation of criteria air pollutants that would exceed Santa Barbara County thresholds of significance. Implementation of Mitigation Measure AQ-1 would further reduce construction dust impacts. As discussed above, the proposed project's construction emissions of criteria pollutants are estimated to be well below the emissions threshold established for the region. Operational emissions associated with the proposed project would not exceed Santa Barbara County established significance thresholds for daily ROC, or PM_{10} emissions; however, NO_x emissions would be above the SPCAPCD threshold. Implementation of Mitigation Measure AQ-2 would reduce mobile source NO_x emissions to the extent feasible; however, NO_x emissions would continue to exceed the Santa Barbara County thresholds. The Santa Barbara County does not have significance thresholds for CO, SO_x, or $PM_{2.5}$, however as indicated above, the proposed project is not expected to generate substantial CO, SO_x, or $PM_{2.5}$ emissions. The proposed project is not expected to produce significant emissions that would affect nearby sensitive receptors. The proposed project would also not result in objectionable odors affecting a substantial number of people. The proposed project would result in significant and unavoidable operational GHG impacts and stationary source GHG impacts. Additionally, the proposed project would be consistent with the SBCAG's RTP/SCS and the goals of the AB 32 Scoping Plan.

Attachments: A: Figures
B: CalEEMod Output Sheets
C: Mobile Source Emissions Estimates
D: Boiler Emissions Calculations
E: HRA Model Snapshots
F: DICE Screening Tool
G: Receptor Locations
H: Manufacturer Specification Sheets for the Fire Pump and Boilers

ATTACHMENT A

FIGURES

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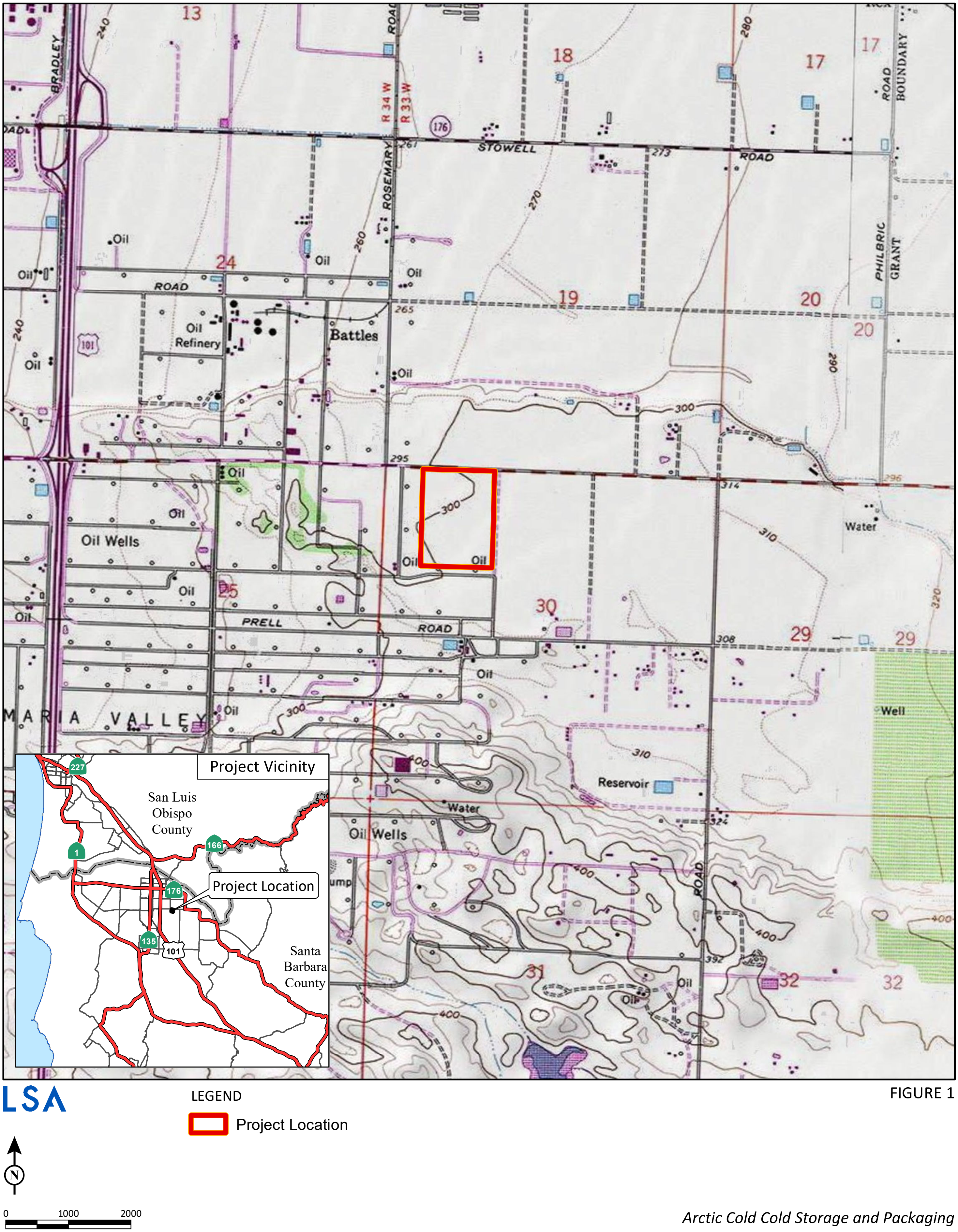


LSA

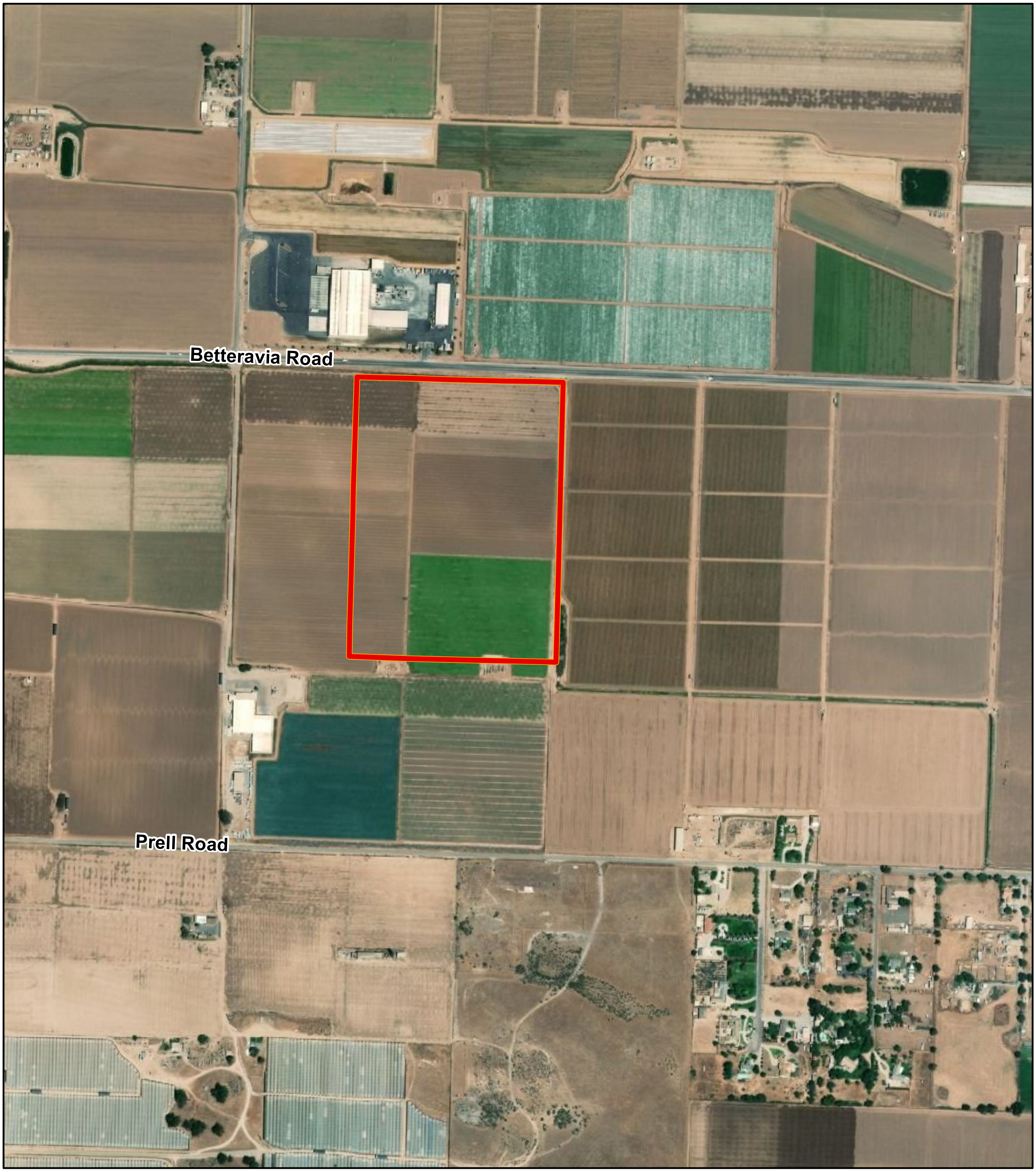
FIGURE 1

Arctic Cold Cold Storage and Packaging

Project Location and Vicinity

SOURCE: USGS 7.5' Quad., *Santa Maria, CA* (1982), *Twitchelle Dam, CA* (1982)

I:\FIC2001\GIS\MXD\ProjectLocation.mxd (3/3/2020)



LSA

LEGEND

Project Location

FIGURE 2

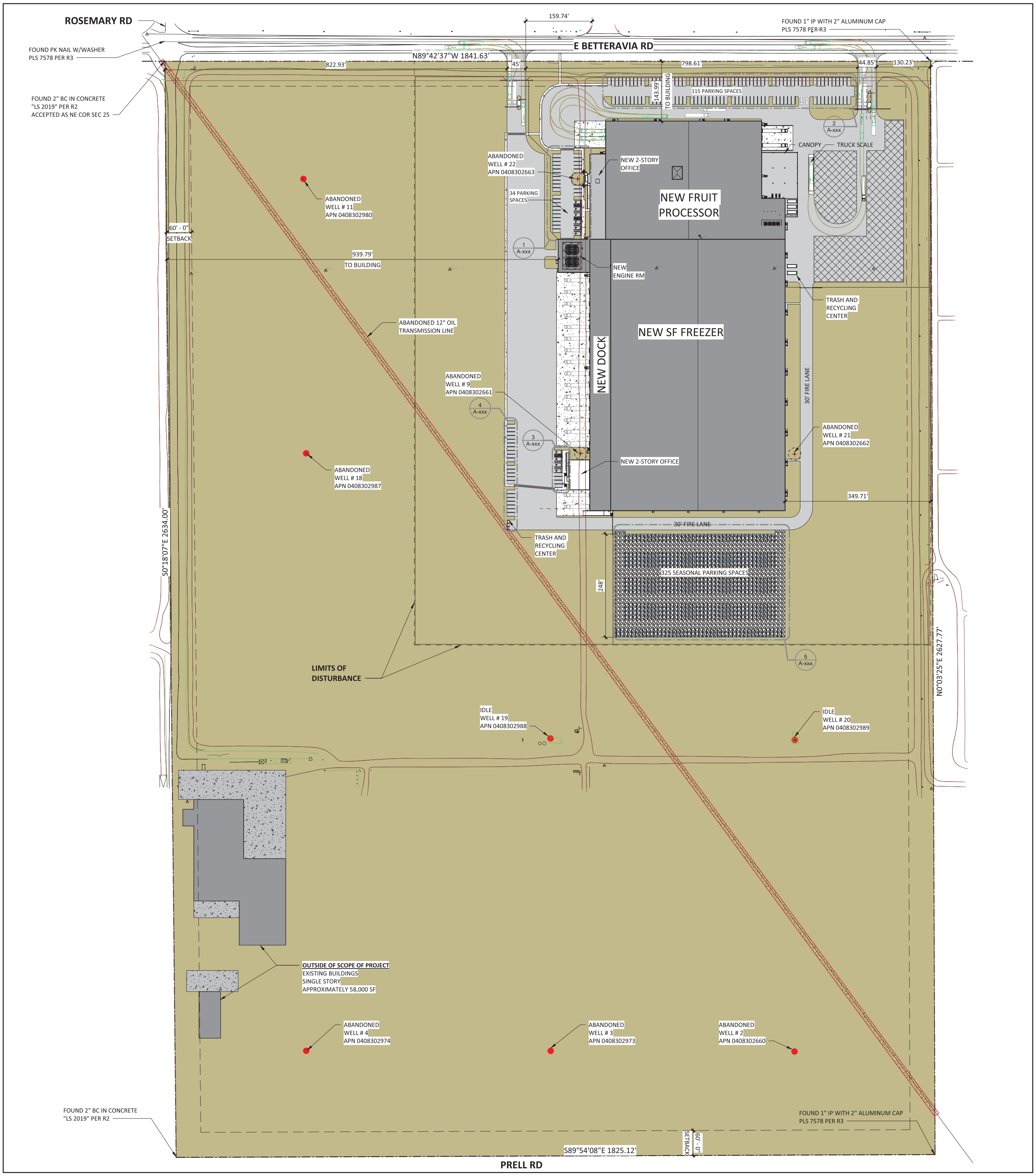
0 375 750
FEET

Arctic Cold Cold Storage and Packaging

Project Site

SOURCE: USGS 7.5' Quad., *Santa Maria, CA* (1982), *Twitchelle Dam, CA* (1982)

I:\FIC2001\GIS\MXD\ProjectSite.mxd (3/3/2020)



LSA

FIGURE 3

N

NOT TO SCALE

Artic Cold Cold Storage and Packaging

Site Plan

SOURCES: FISHER CONSTRUCTION; ARTIC COLD, 2020.

LSA

ATTACHMENT B

CALEEMOD OUTPUT SHEETS

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Arctic Cold Storage and Packing Project

Santa Barbara-North of Santa Ynez County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Refrigerated Warehouse-No Rail	449.25	1000sqft	10.31	449,248.00	0
Parking Lot	496.00	Space	9.41	198,400.00	0

1.2 Other Project Characteristics

Urbanization	Rural	**Wind Speed (m/s)**	3.1	**Precipitation Freq (Days)**	37
Climate Zone	4			**Operational Year**	2022
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	328.8	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics - CO2 intensity per 5-year average (PG&E 2015)

Land Use - Approximately 19.72 acres of the project area will consist of impervious surface (structures and paving).

Construction Phase - Construction is expected to begin January 18, 2021 and end February 2, 2022.

Grading - The proposed would include 64,876 cubic yards of cut and 50,311 cubic yards of fill, and would result in approximately 14,565 cubic yards of net cut.

Vehicle Trips - Based on trip generation and vehicle miles traveled prepared for the proposed project

Energy Use - Based on project's estimated energy usage

Water And Wastewater - Indoor and outdoor water use based on project's estimated water usage

Construction Off-road Equipment Mitigation - Compliance with SBCAPCD standard dust control measures

Energy Mitigation - Assuming compliance with 2019 Title 24 standards and use of LED lighting throughout facility

Waste Mitigation -

Operational Off-Road Equipment - The project would utilize four propane forklifts. CNG was chosen as the closest representative fuel type.

Fleet Mix - Fleet trip percentages based on 1,168 employee trips and 212 truck trips

Stationary Sources - Emergency Generators and Fire Pumps - The project would have a diesel fire pump system

Stationary Sources - Process Boilers -

Table Name	Column Name	Default Value	New Value
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	0	15
tblConstructionPhase	NumDays	300.00	228.00
tblConstructionPhase	NumDays	30.00	35.00
tblEnergyUse	LightingElect	1.62	13.14
tblEnergyUse	NT24E	7.99	64.82
tblEnergyUse	T24E	0.14	1.14
tblFleetMix	HHD	0.02	0.04
tblFleetMix	LDA	0.56	0.42
tblFleetMix	LDT1	0.03	0.21
tblFleetMix	LDT2	0.21	0.21
tblFleetMix	LHD1	0.02	0.00

tblFleetMix	LHD2	5.5720e-003	0.00
tblFleetMix	MCY	6.8860e-003	0.00
tblFleetMix	MDV	0.12	0.08
tblFleetMix	MH	1.0030e-003	0.00
tblFleetMix	MHD	0.02	0.03
tblFleetMix	OBUS	2.7860e-003	0.00
tblFleetMix	SBUS	2.6470e-003	0.00
tblFleetMix	UBUS	2.2650e-003	0.00
tblGrading	AcresOfGrading	87.50	19.72
tblGrading	MaterialExported	0.00	14,565.00
tblLandUse	LandUseSquareFeet	449,250.00	449,248.00
tblLandUse	LotAcreage	4.46	9.41
tblOperationalOffRoadEquipment	OperDaysPerYear	260.00	365.00
tblOperationalOffRoadEquipment	OperFuelType	Diesel	CNG
tblOperationalOffRoadEquipment	OperHoursPerDay	8.00	24.00
tblOperationalOffRoadEquipment	OperOffRoadEquipmentNumber	0.00	4.00
tblProjectCharacteristics	CO2IntensityFactor	641.35	328.8
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblStationaryGeneratorsPumpsEF	CH4_EF	0.07	0.07
tblStationaryGeneratorsPumpsEF	ROG_EF	2.2480e-003	2.2477e-003
tblStationaryGeneratorsPumpsUse	HorsePowerValue	0.00	351.00
tblStationaryGeneratorsPumpsUse	HoursPerDay	0.00	2.00
tblStationaryGeneratorsPumpsUse	HoursPerYear	0.00	50.00
tblStationaryGeneratorsPumpsUse	NumberOfEquipment	0.00	1.00
tblVehicleTrips	CC_TL	5.50	0.00
tblVehicleTrips	CNW_TL	6.40	0.00
tblVehicleTrips	CNW_TTP	41.00	0.00

tblVehicleTrips	CW_TL	6.60	25.00
tblVehicleTrips	CW_TTP	59.00	100.00
tblVehicleTrips	DV_TP	5.00	0.00
tblVehicleTrips	PB_TP	3.00	0.00
tblVehicleTrips	PR_TP	92.00	100.00
tblVehicleTrips	ST_TR	1.68	3.07
tblVehicleTrips	SU_TR	1.68	3.07
tblVehicleTrips	WD_TR	1.68	3.07
tblWater	IndoorWaterUseRate	103,889,062.50	82,968,167.10
tblWater	OutdoorWaterUseRate	0.00	1,013,396.00

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2021	0.4150	4.2308	3.4061	8.8000e-003	0.4611	0.1486	0.6097	0.1779	0.1389	0.3167	0.0000	809.2328	809.2328	0.1237	0.0000	812.3260
2022	5.3340	0.4308	0.4655	1.0500e-003	0.0307	0.0163	0.0469	8.3100e-003	0.0152	0.0236	0.0000	95.1320	95.1320	0.0157	0.0000	95.5250
Maximum	**5.3340**	**4.2308**	**3.4061**	**8.8000e-003**	**0.4611**	**0.1486**	**0.6097**	**0.1779**	**0.1389**	**0.3167**	**0.0000**	**809.2328**	**809.2328**	**0.1237**	**0.0000**	**812.3260**

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					
2021	0.4150	4.2308	3.4061	8.8000e-003	0.3470	0.1486	0.4956	0.1180	0.1389	0.2568	0.0000	809.2323	809.2323	0.1237	0.0000	812.3256
2022	5.3340	0.4308	0.4655	1.0500e-003	0.0307	0.0163	0.0469	8.3100e-003	0.0152	0.0236	0.0000	95.1319	95.1319	0.0157	0.0000	95.5249
Maximum	**5.3340**	**4.2308**	**3.4061**	**8.8000e-003**	**0.3470**	**0.1486**	**0.4956**	**0.1180**	**0.1389**	**0.2568**	**0.0000**	**809.2323**	**809.2323**	**0.1237**	**0.0000**	**812.3256**

	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**	**23.20**	**0.00**	**17.38**	**32.17**	**0.00**	**17.60**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	1-18-2021	4-17-2021	1.6433	1.6433
2	4-18-2021	7-17-2021	1.0307	1.0307
3	7-18-2021	10-17-2021	1.0430	1.0430
4	10-18-2021	1-17-2022	3.3576	3.3576
5	1-18-2022	4-17-2022	3.2689	3.2689
		Highest	3.3576	3.3576

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	2.2956	8.0000e-005	8.7000e-003	0.0000		3.0000e-005	3.0000e-005		3.0000e-005	3.0000e-005	0.0000	0.0169	0.0169	4.0000e-005	0.0000	0.0180
Energy	9.1800e-003	0.0835	0.0701	5.0000e-004		6.3400e-003	6.3400e-003		6.3400e-003	6.3400e-003	0.0000	5,401.0248	5,401.0248	0.4701	0.0986	5,442.1501
Mobile	0.6354	5.8619	13.3808	0.0525	4.7387	0.0416	4.7803	1.2676	0.0390	1.3065	0.0000	4,885.5176	4,885.5176	0.1956	0.0000	4,890.4071
Offroad	0.2488	2.3102	2.5267	3.3500e-003		0.1530	0.1530		0.1408	0.1408	0.0000	294.0980	294.0980	0.0951	0.0000	296.4759
Stationary	0.0144	0.0403	0.0367	7.0000e-005		2.1200e-003	2.1200e-003		2.1200e-003	2.1200e-003	0.0000	6.6830	6.6830	9.4000e-004	0.0000	6.7064
Waste						0.0000	0.0000		0.0000	0.0000	87.6942	0.0000	87.6942	4.3485	0.0000	196.4060
Water						0.0000	0.0000		0.0000	0.0000	29.3543	67.4845	96.8388	0.1070	0.0651	118.9036
Total	**3.2034**	**8.2959**	**16.0231**	**0.0564**	**4.7387**	**0.2031**	**4.9418**	**1.2676**	**0.1883**	**1.4558**	**117.0484**	**10,654.8248**	**10,771.8732**	**5.2172**	**0.1636**	**10,951.0670**

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	2.2956	8.0000e-005	8.7000e-003	0.0000		3.0000e-005	3.0000e-005		3.0000e-005	3.0000e-005	0.0000	0.0169	0.0169	4.0000e-005	0.0000	0.0180
Energy	8.6500e-003	0.0786	0.0661	4.7000e-004		5.9800e-003	5.9800e-003		5.9800e-003	5.9800e-003	0.0000	5,194.7093	5,194.7093	0.4523	0.0948	5,234.2666
Mobile	0.6354	5.8619	13.3808	0.0525	4.7387	0.0416	4.7803	1.2676	0.0390	1.3065	0.0000	4,885.5176	4,885.5176	0.1956	0.0000	4,890.4071
Offroad	0.2488	2.3102	2.5267	3.3500e-003		0.1530	0.1530		0.1408	0.1408	0.0000	294.0980	294.0980	0.0951	0.0000	296.4759
Stationary	0.0144	0.0403	0.0367	7.0000e-005		2.1200e-003	2.1200e-003		2.1200e-003	2.1200e-003	0.0000	6.6830	6.6830	9.4000e-004	0.0000	6.7064
Waste						0.0000	0.0000		0.0000	0.0000	87.6942	0.0000	87.6942	4.3485	0.0000	196.4060
Water						0.0000	0.0000		0.0000	0.0000	29.3543	67.4845	96.8388	0.1070	0.0651	118.9036
Total	**3.2029**	**8.2911**	**16.0190**	**0.0564**	**4.7387**	**0.2028**	**4.9415**	**1.2676**	**0.1879**	**1.4555**	**117.0484**	**10,448.5092**	**10,565.5577**	**5.1994**	**0.1599**	**10,743.1835**

	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	**0.02**	**0.06**	**0.03**	**0.05**	**0.00**	**0.18**	**0.01**	**0.00**	**0.19**	**0.02**	**0.00**	**1.94**	**1.92**	**0.34**	**2.30**	**1.90**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site Preparation	Site Preparation	1/18/2021	1/29/2021	5	10	
2	Grading	Grading	1/30/2021	3/19/2021	5	35	
3	Building Construction	Building Construction	3/22/2021	2/2/2022	5	228	
4	Paving	Paving	1/6/2022	2/2/2022	5	20	
5	Architectural Coating	Architectural Coating	1/6/2022	2/2/2022	5	20	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 19.72

Acres of Paving: 9.41

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 673,872; Non-Residential Outdoor: 224,624; Striped Parking Area: 11,904 (Architectural Coating – sqft)

<u>OffRoad Equipment</u>

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Site Preparation	Rubber Tired Dozers	3	8.00	247	0.40
Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Grading	Excavators	2	8.00	158	0.38
Grading	Graders	1	8.00	187	0.41
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Grading	Scrapers	2	8.00	367	0.48
Grading	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Building Construction	Cranes	1	7.00	231	0.29
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Building Construction	Welders	1	8.00	46	0.45
Paving	Pavers	2	8.00	130	0.42
Paving	Paving Equipment	2	8.00	132	0.36
Paving	Rollers	2	8.00	80	0.38
Architectural Coating	Air Compressors	1	6.00	78	0.48

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Site Preparation	7	18.00	0.00	0.00	8.30	6.40	20.00	LD_Mix	HDT_Mix	HHDT
Grading	8	20.00	0.00	1,821.00	8.30	6.40	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	272.00	106.00	0.00	8.30	6.40	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	8.30	6.40	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	54.00	0.00	0.00	8.30	6.40	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Water Exposed Area

Reduce Vehicle Speed on Unpaved Roads

3.2 Site Preparation - 2021

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					0.0903	0.0000	0.0903	0.0497	0.0000	0.0497	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0194	0.2025	0.1058	1.9000e-004		0.0102	0.0102		9.4000e-003	9.4000e-003	0.0000	16.7179	16.7179	5.4100e-003	0.0000	16.8530
Total	**0.0194**	**0.2025**	**0.1058**	**1.9000e-004**	**0.0903**	**0.0102**	**0.1006**	**0.0497**	**9.4000e-003**	**0.0591**	**0.0000**	**16.7179**	**16.7179**	**5.4100e-003**	**0.0000**	**16.8530**

3.2 Site Preparation - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.7000e-004	2.2000e-004	1.9300e-003	0.0000	5.6000e-004	0.0000	5.6000e-004	1.5000e-004	0.0000	1.5000e-004	0.0000	0.4386	0.4386	1.0000e-005	0.0000	0.4389
Total	**2.7000e-004**	**2.2000e-004**	**1.9300e-003**	**0.0000**	**5.6000e-004**	**0.0000**	**5.6000e-004**	**1.5000e-004**	**0.0000**	**1.5000e-004**	**0.0000**	**0.4386**	**0.4386**	**1.0000e-005**	**0.0000**	**0.4389**

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					0.0407	0.0000	0.0407	0.0223	0.0000	0.0223	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0194	0.2025	0.1058	1.9000e-004		0.0102	0.0102		9.4000e-003	9.4000e-003	0.0000	16.7178	16.7178	5.4100e-003	0.0000	16.8530
Total	**0.0194**	**0.2025**	**0.1058**	**1.9000e-004**	**0.0407**	**0.0102**	**0.0509**	**0.0223**	**9.4000e-003**	**0.0317**	**0.0000**	**16.7178**	**16.7178**	**5.4100e-003**	**0.0000**	**16.8530**

3.2 Site Preparation - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.7000e-004	2.2000e-004	1.9300e-003	0.0000	5.6000e-004	0.0000	5.6000e-004	1.5000e-004	0.0000	1.5000e-004	0.0000	0.4386	0.4386	1.0000e-005	0.0000	0.4389
Total	**2.7000e-004**	**2.2000e-004**	**1.9300e-003**	**0.0000**	**5.6000e-004**	**0.0000**	**5.6000e-004**	**1.5000e-004**	**0.0000**	**1.5000e-004**	**0.0000**	**0.4386**	**0.4386**	**1.0000e-005**	**0.0000**	**0.4389**

3.3 Grading - 2021

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					0.1171	0.0000	0.1171	0.0593	0.0000	0.0593	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0734	0.8120	0.5404	1.0900e-003		0.0347	0.0347		0.0320	0.0320	0.0000	95.3662	95.3662	0.0308	0.0000	96.1373
Total	**0.0734**	**0.8120**	**0.5404**	**1.0900e-003**	**0.1171**	**0.0347**	**0.1519**	**0.0593**	**0.0320**	**0.0912**	**0.0000**	**95.3662**	**95.3662**	**0.0308**	**0.0000**	**96.1373**

3.3 Grading - 2021

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	6.9700e-003	0.2559	0.0776	6.9000e-004	0.0155	9.9000e-004	0.0165	4.2500e-003	9.5000e-004	5.2000e-003	0.0000	70.3722	70.3722	6.7600e-003	0.0000	70.5411
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.0400e-003	8.5000e-004	7.5200e-003	2.0000e-005	2.1600e-003	1.0000e-005	2.1800e-003	5.7000e-004	1.0000e-005	5.9000e-004	0.0000	1.7056	1.7056	5.0000e-005	0.0000	1.7069
Total	**8.0100e-003**	**0.2567**	**0.0851**	**7.1000e-004**	**0.0177**	**1.0000e-003**	**0.0187**	**4.8200e-003**	**9.6000e-004**	**5.7900e-003**	**0.0000**	**72.0778**	**72.0778**	**6.8100e-003**	**0.0000**	**72.2480**

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					0.0527	0.0000	0.0527	0.0267	0.0000	0.0267	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0734	0.8120	0.5404	1.0900e-003		0.0347	0.0347		0.0320	0.0320	0.0000	95.3661	95.3661	0.0308	0.0000	96.1372
Total	**0.0734**	**0.8120**	**0.5404**	**1.0900e-003**	**0.0527**	**0.0347**	**0.0875**	**0.0267**	**0.0320**	**0.0586**	**0.0000**	**95.3661**	**95.3661**	**0.0308**	**0.0000**	**96.1372**

3.3 Grading - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	6.9700e-003	0.2559	0.0776	6.9000e-004	0.0155	9.9000e-004	0.0165	4.2500e-003	9.5000e-004	5.2000e-003	0.0000	70.3722	70.3722	6.7600e-003	0.0000	70.5411
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.0400e-003	8.5000e-004	7.5200e-003	2.0000e-005	2.1600e-003	1.0000e-005	2.1800e-003	5.7000e-004	1.0000e-005	5.9000e-004	0.0000	1.7056	1.7056	5.0000e-005	0.0000	1.7069
Total	**8.0100e-003**	**0.2567**	**0.0851**	**7.1000e-004**	**0.0177**	**1.0000e-003**	**0.0187**	**4.8200e-003**	**9.6000e-004**	**5.7900e-003**	**0.0000**	**72.0778**	**72.0778**	**6.8100e-003**	**0.0000**	**72.2480**

3.4 Building Construction - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1948	1.7868	1.6990	2.7600e-003		0.0983	0.0983		0.0924	0.0924	0.0000	237.4282	237.4282	0.0573	0.0000	238.8602
Total	**0.1948**	**1.7868**	**1.6990**	**2.7600e-003**		**0.0983**	**0.0983**		**0.0924**	**0.0924**	**0.0000**	**237.4282**	**237.4282**	**0.0573**	**0.0000**	**238.8602**

3.4 Building Construction - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0361	1.1052	0.3754	2.5400e-003	0.0632	3.2800e-003	0.0665	0.0182	3.1400e-003	0.0214	0.0000	251.3428	251.3428	0.0191	0.0000	251.8210
Worker	0.0830	0.0673	0.5987	1.5000e-003	0.1722	1.0900e-003	0.1733	0.0458	1.0000e-003	0.0468	0.0000	135.8613	135.8613	4.2500e-003	0.0000	135.9676
Total	**0.1191**	**1.1726**	**0.9740**	**4.0400e-003**	**0.2354**	**4.3700e-003**	**0.2397**	**0.0640**	**4.1400e-003**	**0.0681**	**0.0000**	**387.2041**	**387.2041**	**0.0234**	**0.0000**	**387.7885**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1948	1.7868	1.6990	2.7600e-003		0.0983	0.0983		0.0924	0.0924	0.0000	237.4279	237.4279	0.0573	0.0000	238.8600
Total	**0.1948**	**1.7868**	**1.6990**	**2.7600e-003**		**0.0983**	**0.0983**		**0.0924**	**0.0924**	**0.0000**	**237.4279**	**237.4279**	**0.0573**	**0.0000**	**238.8600**

3.4 Building Construction - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0361	1.1052	0.3754	2.5400e-003	0.0632	3.2800e-003	0.0665	0.0182	3.1400e-003	0.0214	0.0000	251.3428	251.3428	0.0191	0.0000	251.8210
Worker	0.0830	0.0673	0.5987	1.5000e-003	0.1722	1.0900e-003	0.1733	0.0458	1.0000e-003	0.0468	0.0000	135.8613	135.8613	4.2500e-003	0.0000	135.9676
Total	**0.1191**	**1.1726**	**0.9740**	**4.0400e-003**	**0.2354**	**4.3700e-003**	**0.2397**	**0.0640**	**4.1400e-003**	**0.0681**	**0.0000**	**387.2041**	**387.2041**	**0.0234**	**0.0000**	**387.7885**

3.4 Building Construction - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0196	0.1796	0.1882	3.1000e-004		9.3000e-003	9.3000e-003		8.7500e-003	8.7500e-003	0.0000	26.6484	26.6484	6.3800e-003	0.0000	26.8080
Total	**0.0196**	**0.1796**	**0.1882**	**3.1000e-004**		**9.3000e-003**	**9.3000e-003**		**8.7500e-003**	**8.7500e-003**	**0.0000**	**26.6484**	**26.6484**	**6.3800e-003**	**0.0000**	**26.8080**

3.4 Building Construction - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	3.7300e-003	0.1176	0.0388	2.8000e-004	7.0900e-003	3.2000e-004	7.4100e-003	2.0400e-003	3.1000e-004	2.3500e-003	0.0000	27.9609	27.9609	2.1700e-003	0.0000	28.0153
Worker	8.6700e-003	6.7500e-003	0.0611	1.6000e-004	0.0193	1.2000e-004	0.0194	5.1300e-003	1.1000e-004	5.2400e-003	0.0000	14.6994	14.6994	4.2000e-004	0.0000	14.7100
Total	**0.0124**	**0.1244**	**0.0999**	**4.4000e-004**	**0.0264**	**4.4000e-004**	**0.0269**	**7.1700e-003**	**4.2000e-004**	**7.5900e-003**	**0.0000**	**42.6603**	**42.6603**	**2.5900e-003**	**0.0000**	**42.7252**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0196	0.1796	0.1882	3.1000e-004		9.3000e-003	9.3000e-003		8.7500e-003	8.7500e-003	0.0000	26.6484	26.6484	6.3800e-003	0.0000	26.8080
Total	**0.0196**	**0.1796**	**0.1882**	**3.1000e-004**		**9.3000e-003**	**9.3000e-003**		**8.7500e-003**	**8.7500e-003**	**0.0000**	**26.6484**	**26.6484**	**6.3800e-003**	**0.0000**	**26.8080**

3.4 Building Construction - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	3.7300e-003	0.1176	0.0388	2.8000e-004	7.0900e-003	3.2000e-004	7.4100e-003	2.0400e-003	3.1000e-004	2.3500e-003	0.0000	27.9609	27.9609	2.1700e-003	0.0000	28.0153
Worker	8.6700e-003	6.7500e-003	0.0611	1.6000e-004	0.0193	1.2000e-004	0.0194	5.1300e-003	1.1000e-004	5.2400e-003	0.0000	14.6994	14.6994	4.2000e-004	0.0000	14.7100
Total	**0.0124**	**0.1244**	**0.0999**	**4.4000e-004**	**0.0264**	**4.4000e-004**	**0.0269**	**7.1700e-003**	**4.2000e-004**	**7.5900e-003**	**0.0000**	**42.6603**	**42.6603**	**2.5900e-003**	**0.0000**	**42.7252**

3.5 Paving - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0110	0.1113	0.1458	2.3000e-004		5.6800e-003	5.6800e-003		5.2200e-003	5.2200e-003	0.0000	20.0276	20.0276	6.4800e-003	0.0000	20.1895
Paving	0.0123					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0234**	**0.1113**	**0.1458**	**2.3000e-004**		**5.6800e-003**	**5.6800e-003**		**5.2200e-003**	**5.2200e-003**	**0.0000**	**20.0276**	**20.0276**	**6.4800e-003**	**0.0000**	**20.1895**

3.5 Paving - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.2000e-004	3.2000e-004	2.9300e-003	1.0000e-005	9.3000e-004	1.0000e-005	9.3000e-004	2.5000e-004	1.0000e-005	2.5000e-004	0.0000	0.7049	0.7049	2.0000e-005	0.0000	0.7054
Total	**4.2000e-004**	**3.2000e-004**	**2.9300e-003**	**1.0000e-005**	**9.3000e-004**	**1.0000e-005**	**9.3000e-004**	**2.5000e-004**	**1.0000e-005**	**2.5000e-004**	**0.0000**	**0.7049**	**0.7049**	**2.0000e-005**	**0.0000**	**0.7054**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0110	0.1113	0.1458	2.3000e-004		5.6800e-003	5.6800e-003		5.2200e-003	5.2200e-003	0.0000	20.0275	20.0275	6.4800e-003	0.0000	20.1895
Paving	0.0123					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0234**	**0.1113**	**0.1458**	**2.3000e-004**		**5.6800e-003**	**5.6800e-003**		**5.2200e-003**	**5.2200e-003**	**0.0000**	**20.0275**	**20.0275**	**6.4800e-003**	**0.0000**	**20.1895**

3.5 Paving - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.2000e-004	3.2000e-004	2.9300e-003	1.0000e-005	9.3000e-004	1.0000e-005	9.3000e-004	2.5000e-004	1.0000e-005	2.5000e-004	0.0000	0.7049	0.7049	2.0000e-005	0.0000	0.7054
Total	**4.2000e-004**	**3.2000e-004**	**2.9300e-003**	**1.0000e-005**	**9.3000e-004**	**1.0000e-005**	**9.3000e-004**	**2.5000e-004**	**1.0000e-005**	**2.5000e-004**	**0.0000**	**0.7049**	**0.7049**	**2.0000e-005**	**0.0000**	**0.7054**

3.6 Architectural Coating - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	5.2746					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.0500e-003	0.0141	0.0181	3.0000e-005		8.2000e-004	8.2000e-004		8.2000e-004	8.2000e-004	0.0000	2.5533	2.5533	1.7000e-004	0.0000	2.5574
Total	**5.2767**	**0.0141**	**0.0181**	**3.0000e-005**		**8.2000e-004**	**8.2000e-004**		**8.2000e-004**	**8.2000e-004**	**0.0000**	**2.5533**	**2.5533**	**1.7000e-004**	**0.0000**	**2.5574**

3.6 Architectural Coating - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.5000e-003	1.1700e-003	0.0106	3.0000e-005	3.3400e-003	2.0000e-005	3.3600e-003	8.9000e-004	2.0000e-005	9.1000e-004	0.0000	2.5376	2.5376	7.0000e-005	0.0000	2.5394
Total	**1.5000e-003**	**1.1700e-003**	**0.0106**	**3.0000e-005**	**3.3400e-003**	**2.0000e-005**	**3.3600e-003**	**8.9000e-004**	**2.0000e-005**	**9.1000e-004**	**0.0000**	**2.5376**	**2.5376**	**7.0000e-005**	**0.0000**	**2.5394**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	5.2746					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.0500e-003	0.0141	0.0181	3.0000e-005		8.2000e-004	8.2000e-004		8.2000e-004	8.2000e-004	0.0000	2.5533	2.5533	1.7000e-004	0.0000	2.5574
Total	**5.2767**	**0.0141**	**0.0181**	**3.0000e-005**		**8.2000e-004**	**8.2000e-004**		**8.2000e-004**	**8.2000e-004**	**0.0000**	**2.5533**	**2.5533**	**1.7000e-004**	**0.0000**	**2.5574**

3.6 Architectural Coating - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.5000e-003	1.1700e-003	0.0106	3.0000e-005	3.3400e-003	2.0000e-005	3.3600e-003	8.9000e-004	2.0000e-005	9.1000e-004	0.0000	2.5376	2.5376	7.0000e-005	0.0000	2.5394
Total	**1.5000e-003**	**1.1700e-003**	**0.0106**	**3.0000e-005**	**3.3400e-003**	**2.0000e-005**	**3.3600e-003**	**8.9000e-004**	**2.0000e-005**	**9.1000e-004**	**0.0000**	**2.5376**	**2.5376**	**7.0000e-005**	**0.0000**	**2.5394**

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	0.6354	5.8619	13.3808	0.0525	4.7387	0.0416	4.7803	1.2676	0.0390	1.3065	0.0000	4,885.517 6	4,885.517 6	0.1956	0.0000	4,890.407 1
Unmitigated	0.6354	5.8619	13.3808	0.0525	4.7387	0.0416	4.7803	1.2676	0.0390	1.3065	0.0000	4,885.517 6	4,885.517 6	0.1956	0.0000	4,890.407 1

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Parking Lot	0.00	0.00	0.00		
Refrigerated Warehouse-No Rail	1,379.20	1,379.20	1379.20	12,550,697	12,550,697
Total	1,379.20	1,379.20	1,379.20	12,550,697	12,550,697

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
Parking Lot	6.60	5.50	6.40	0.00	0.00	0.00	0	0	0
Refrigerated Warehouse-No Rail	25.00	0.00	0.00	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
Parking Lot	0.563532	0.028682	0.205515	0.123285	0.020921	0.005572	0.017481	0.019425	0.002786	0.002265	0.006886	0.002647	0.001003
Refrigerated Warehouse-No Rail	0.423188	0.211594	0.211594	0.075362	0.000000	0.000000	0.034783	0.043478	0.000000	0.000000	0.000000	0.000000	0.000000

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

Exceed Title 24

Install High Efficiency Lighting

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	5,109.0996	5,109.0996	0.4506	0.0932	5,148.1482
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	5,310.1650	5,310.1650	0.4684	0.0969	5,350.7503
NaturalGas Mitigated	8.6500e-003	0.0786	0.0661	4.7000e-004		5.9800e-003	5.9800e-003		5.9800e-003	5.9800e-003	0.0000	85.6097	85.6097	1.6400e-003	1.5700e-003	86.1184
NaturalGas Unmitigated	9.1800e-003	0.0835	0.0701	5.0000e-004		6.3400e-003	6.3400e-003		6.3400e-003	6.3400e-003	0.0000	90.8599	90.8599	1.7400e-003	1.6700e-003	91.3998

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					
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Refrigerated Warehouse-No Rail	1.70265e+006	9.1800e-003	0.0835	0.0701	5.0000e-004		6.3400e-003	6.3400e-003		6.3400e-003	6.3400e-003	0.0000	90.8599	90.8599	1.7400e-003	1.6700e-003	91.3998
Total		**9.1800e-003**	**0.0835**	**0.0701**	**5.0000e-004**		**6.3400e-003**	**6.3400e-003**		**6.3400e-003**	**6.3400e-003**	**0.0000**	**90.8599**	**90.8599**	**1.7400e-003**	**1.6700e-003**	**91.3998**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Refrigerated Warehouse-No Rail	1.60426e+006	8.6500e-003	0.0786	0.0661	4.7000e-004		5.9800e-003	5.9800e-003		5.9800e-003	5.9800e-003	0.0000	85.6097	85.6097	1.6400e-003	1.5700e-003	86.1184
Total		**8.6500e-003**	**0.0786**	**0.0661**	**4.7000e-004**		**5.9800e-003**	**5.9800e-003**		**5.9800e-003**	**5.9800e-003**	**0.0000**	**85.6097**	**85.6097**	**1.6400e-003**	**1.5700e-003**	**86.1184**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Parking Lot	69440	10.3564	9.1000e-004	1.9000e-004	10.4355
Refrigerated Warehouse-No Rail	3.55355e+007	5,299.8086	0.4674	0.0967	5,340.3147
Total		**5,310.1650**	**0.4684**	**0.0969**	**5,350.7503**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Parking Lot	55552	8.2851	7.3000e-004	1.5000e-004	8.3484
Refrigerated Warehouse-No Rail	3.42013e+007	5,100.8145	0.4499	0.0931	5,139.7998
Total		**5,109.0996**	**0.4506**	**0.0932**	**5,148.1482**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	2.2956	8.0000e-005	8.7000e-003	0.0000		3.0000e-005	3.0000e-005		3.0000e-005	3.0000e-005	0.0000	0.0169	0.0169	4.0000e-005	0.0000	0.0180
Unmitigated	2.2956	8.0000e-005	8.7000e-003	0.0000		3.0000e-005	3.0000e-005		3.0000e-005	3.0000e-005	0.0000	0.0169	0.0169	4.0000e-005	0.0000	0.0180

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	0.5275					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	1.7674					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	8.1000e-004	8.0000e-005	8.7000e-003	0.0000		3.0000e-005	3.0000e-005		3.0000e-005	3.0000e-005	0.0000	0.0169	0.0169	4.0000e-005	0.0000	0.0180
Total	**2.2956**	**8.0000e-005**	**8.7000e-003**	**0.0000**		**3.0000e-005**	**3.0000e-005**		**3.0000e-005**	**3.0000e-005**	**0.0000**	**0.0169**	**0.0169**	**4.0000e-005**	**0.0000**	**0.0180**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.5275					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	1.7674					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	8.1000e-004	8.0000e-005	8.7000e-003	0.0000		3.0000e-005	3.0000e-005		3.0000e-005	3.0000e-005	0.0000	0.0169	0.0169	4.0000e-005	0.0000	0.0180
Total	**2.2956**	**8.0000e-005**	**8.7000e-003**	**0.0000**		**3.0000e-005**	**3.0000e-005**		**3.0000e-005**	**3.0000e-005**	**0.0000**	**0.0169**	**0.0169**	**4.0000e-005**	**0.0000**	**0.0180**

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	96.8388	0.1070	0.0651	118.9036
Unmitigated	96.8388	0.1070	0.0651	118.9036

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000
Refrigerated Warehouse-No Rail	82.9682 / 1.0134	96.8388	0.1070	0.0651	118.9036
Total		**96.8388**	**0.1070**	**0.0651**	**118.9036**

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000
Refrigerated Warehouse-No Rail	82.9682 / 1.0134	96.8388	0.1070	0.0651	118.9036
Total		**96.8388**	**0.1070**	**0.0651**	**118.9036**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	87.6942	4.3485	0.0000	196.4060
Unmitigated	87.6942	4.3485	0.0000	196.4060

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Refrigerated Warehouse-No Rail	422.29	87.6942	4.3485	0.0000	196.4060
Total		**87.6942**	**4.3485**	**0.0000**	**196.4060**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Refrigerated Warehouse-No Rail	422.29	87.6942	4.3485	0.0000	196.4060
Total		**87.6942**	**4.3485**	**0.0000**	**196.4060**

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type
Forklifts	4	24.00	365	89	0.20	CNG

UnMitigated/Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Equipment Type	tons/yr										MT/yr					
Forklifts	0.2488	2.3102	2.5267	3.3500e-003		0.1530	0.1530		0.1408	0.1408	0.0000	294.0980	294.0980	0.0951	0.0000	296.4759
Total	**0.2488**	**2.3102**	**2.5267**	**3.3500e-003**		**0.1530**	**0.1530**		**0.1408**	**0.1408**	**0.0000**	**294.0980**	**294.0980**	**0.0951**	**0.0000**	**296.4759**

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type
Fire Pump	1	2	50	351	0.73	Diesel

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

10.1 Stationary Sources

Unmitigated/Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Equipment Type	tons/yr										MT/yr					
Fire Pump - Diesel (300 - 600 HP)	0.0144	0.0403	0.0367	7.0000e-005		2.1200e-003	2.1200e-003		2.1200e-003	2.1200e-003	0.0000	6.6830	6.6830	9.4000e-004	0.0000	6.7064
Total	**0.0144**	**0.0403**	**0.0367**	**7.0000e-005**		**2.1200e-003**	**2.1200e-003**		**2.1200e-003**	**2.1200e-003**	**0.0000**	**6.6830**	**6.6830**	**9.4000e-004**	**0.0000**	**6.7064**

11.0 Vegetation

Arctic Cold Storage and Packing Project

Santa Barbara-North of Santa Ynez County, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Refrigerated Warehouse-No Rail	449.25	1000sqft	10.31	449,248.00	0
Parking Lot	496.00	Space	9.41	198,400.00	0

1.2 Other Project Characteristics

Urbanization	Rural	**Wind Speed (m/s)**	3.1	**Precipitation Freq (Days)**	37
Climate Zone	4			**Operational Year**	2022
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	328.8	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics - CO2 intensity per 5-year average (PG&E 2015)

Land Use - Approximately 19.72 acres of the project area will consist of impervious surface (structures and paving).

Construction Phase - Construction is expected to begin January 18, 2021 and end February 2, 2022.

Grading - The proposed would include 64,876 cubic yards of cut and 50,311 cubic yards of fill, and would result in approximately 14,565 cubic yards of net cut.

Vehicle Trips - Based on trip generation and vehicle miles traveled prepared for the proposed project

Energy Use - Based on project's estimated energy usage

Water And Wastewater - Indoor and outdoor water use based on project's estimated water usage

Construction Off-road Equipment Mitigation - Compliance with SBCAPCD standard dust control measures

Energy Mitigation - Assuming compliance with 2019 Title 24 standards and use of LED lighting throughout facility

Waste Mitigation -

Operational Off-Road Equipment - The project would utilize four propane forklifts. CNG was chosen as the closest representative fuel type.

Fleet Mix - Fleet trip percentages based on 1,168 employee trips and 212 truck trips

Stationary Sources - Emergency Generators and Fire Pumps - The project would have a diesel fire pump system

Stationary Sources - Process Boilers -

Table Name	Column Name	Default Value	New Value
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	0	15
tblConstructionPhase	NumDays	300.00	228.00
tblConstructionPhase	NumDays	30.00	35.00
tblEnergyUse	LightingElect	1.62	13.14
tblEnergyUse	NT24E	7.99	64.82
tblEnergyUse	T24E	0.14	1.14
tblFleetMix	HHD	0.02	0.04
tblFleetMix	LDA	0.56	0.42
tblFleetMix	LDT1	0.03	0.21
tblFleetMix	LDT2	0.21	0.21
tblFleetMix	LHD1	0.02	0.00

tblFleetMix	LHD2	5.5720e-003	0.00
tblFleetMix	MCY	6.8860e-003	0.00
tblFleetMix	MDV	0.12	0.08
tblFleetMix	MH	1.0030e-003	0.00
tblFleetMix	MHD	0.02	0.03
tblFleetMix	OBUS	2.7860e-003	0.00
tblFleetMix	SBUS	2.6470e-003	0.00
tblFleetMix	UBUS	2.2650e-003	0.00
tblGrading	AcresOfGrading	87.50	19.72
tblGrading	MaterialExported	0.00	14,565.00
tblLandUse	LandUseSquareFeet	449,250.00	449,248.00
tblLandUse	LotAcreage	4.46	9.41
tblOperationalOffRoadEquipment	OperDaysPerYear	260.00	365.00
tblOperationalOffRoadEquipment	OperFuelType	Diesel	CNG
tblOperationalOffRoadEquipment	OperHoursPerDay	8.00	24.00
tblOperationalOffRoadEquipment	OperOffRoadEquipmentNumber	0.00	4.00
tblProjectCharacteristics	CO2IntensityFactor	641.35	328.8
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblStationaryGeneratorsPumpsEF	CH4_EF	0.07	0.07
tblStationaryGeneratorsPumpsEF	ROG_EF	2.2480e-003	2.2477e-003
tblStationaryGeneratorsPumpsUse	HorsePowerValue	0.00	351.00
tblStationaryGeneratorsPumpsUse	HoursPerDay	0.00	2.00
tblStationaryGeneratorsPumpsUse	HoursPerYear	0.00	50.00
tblStationaryGeneratorsPumpsUse	NumberOfEquipment	0.00	1.00
tblVehicleTrips	CC_TL	5.50	0.00
tblVehicleTrips	CNW_TL	6.40	0.00
tblVehicleTrips	CNW_TTP	41.00	0.00

tblVehicleTrips	CW_TL	6.60	25.00
tblVehicleTrips	CW_TTP	59.00	100.00
tblVehicleTrips	DV_TP	5.00	0.00
tblVehicleTrips	PB_TP	3.00	0.00
tblVehicleTrips	PR_TP	92.00	100.00
tblVehicleTrips	ST_TR	1.68	3.07
tblVehicleTrips	SU_TR	1.68	3.07
tblVehicleTrips	WD_TR	1.68	3.07
tblWater	IndoorWaterUseRate	103,889,062.50	82,968,167.10
tblWater	OutdoorWaterUseRate	0.00	1,013,396.00

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2021	4.6433	60.7558	35.6566	0.1029	18.1799	2.0452	20.2251	9.9608	1.8816	11.8424	0.0000	10,575.1630	10,575.1630	2.3681	0.0000	10,634.3663
2022	532.9450	38.9300	42.5613	0.0956	2.7813	1.4990	4.2803	0.7519	1.4035	2.1555	0.0000	9,556.5435	9,556.5435	1.5996	0.0000	9,596.5338
Maximum	**532.9450**	**60.7558**	**42.5613**	**0.1029**	**18.1799**	**2.0452**	**20.2251**	**9.9608**	**1.8816**	**11.8424**	**0.0000**	**10,575.1630**	**10,575.1630**	**2.3681**	**0.0000**	**10,634.3663**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2021	4.6433	60.7558	35.6566	0.1029	8.2435	2.0452	10.2887	4.4990	1.8816	6.3805	0.0000	10,575.1630	10,575.1630	2.3681	0.0000	10,634.3663
2022	532.9450	38.9300	42.5613	0.0956	2.7813	1.4990	4.2803	0.7519	1.4035	2.1555	0.0000	9,556.5435	9,556.5435	1.5996	0.0000	9,596.5338
Maximum	**532.9450**	**60.7558**	**42.5613**	**0.1029**	**8.2435**	**2.0452**	**10.2887**	**4.4990**	**1.8816**	**6.3805**	**0.0000**	**10,575.1630**	**10,575.1630**	**2.3681**	**0.0000**	**10,634.3663**

	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**	**47.40**	**0.00**	**40.55**	**50.98**	**0.00**	**39.02**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	12.5834	8.8000e-004	0.0967	1.0000e-005		3.5000e-004	3.5000e-004		3.5000e-004	3.5000e-004		0.2069	0.2069	5.5000e-004		0.2205
Energy	0.0503	0.4573	0.3842	2.7400e-003		0.0348	0.0348		0.0348	0.0348		548.7993	548.7993	0.0105	0.0101	552.0606
Mobile	3.5933	30.7674	74.7497	0.2937	26.6145	0.2282	26.8427	7.1064	0.2138	7.3201		30,113.5432	30,113.5432	1.1933		30,143.3767
Offroad	1.3632	12.6588	13.8450	0.0183		0.8386	0.8386		0.7715	0.7715		1,776.3700	1,776.3700	0.5745		1,790.7328
Stationary	1.1519	3.2199	2.9374	5.5400e-003		0.1695	0.1695		0.1695	0.1695		589.3389	589.3389	0.0826		591.4046
Total	**18.7421**	**47.1043**	**92.0129**	**0.3204**	**26.6145**	**1.2713**	**27.8858**	**7.1064**	**1.1898**	**8.2962**		**33,028.2583**	**33,028.2583**	**1.8616**	**0.0101**	**33,077.7952**

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	12.5834	8.8000e-004	0.0967	1.0000e-005		3.5000e-004	3.5000e-004		3.5000e-004	3.5000e-004		0.2069	0.2069	5.5000e-004		0.2205
Energy	0.0474	0.4309	0.3620	2.5900e-003		0.0328	0.0328		0.0328	0.0328		517.0877	517.0877	9.9100e-003	9.4800e-003	520.1605
Mobile	3.5933	30.7674	74.7497	0.2937	26.6145	0.2282	26.8427	7.1064	0.2138	7.3201		30,113.5432	30,113.5432	1.1933		30,143.3767
Offroad	1.3632	12.6588	13.8450	0.0183		0.8386	0.8386		0.7715	0.7715		1,776.3700	1,776.3700	0.5745		1,790.7328
Stationary	1.1519	3.2199	2.9374	5.5400e-003		0.1695	0.1695		0.1695	0.1695		589.3389	589.3389	0.0826		591.4046
Total	**18.7392**	**47.0778**	**91.9907**	**0.3202**	**26.6145**	**1.2693**	**27.8838**	**7.1064**	**1.1878**	**8.2942**		**32,996.5467**	**32,996.5467**	**1.8609**	**9.4800e-003**	**33,045.8951**

	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	**0.02**	**0.06**	**0.02**	**0.05**	**0.00**	**0.16**	**0.01**	**0.00**	**0.17**	**0.02**	**0.00**	**0.10**	**0.10**	**0.03**	**5.77**	**0.10**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site Preparation	Site Preparation	1/18/2021	1/29/2021	5	10	
2	Grading	Grading	1/30/2021	3/19/2021	5	35	
3	Building Construction	Building Construction	3/22/2021	2/2/2022	5	228	
4	Paving	Paving	1/6/2022	2/2/2022	5	20	
5	Architectural Coating	Architectural Coating	1/6/2022	2/2/2022	5	20	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 19.72

Acres of Paving: 9.41

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 673,872; Non-Residential Outdoor: 224,624; Striped Parking Area: 11,904 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Site Preparation	Rubber Tired Dozers	3	8.00	247	0.40
Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Grading	Excavators	2	8.00	158	0.38
Grading	Graders	1	8.00	187	0.41
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Grading	Scrapers	2	8.00	367	0.48
Grading	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Building Construction	Cranes	1	7.00	231	0.29
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Building Construction	Welders	1	8.00	46	0.45
Paving	Pavers	2	8.00	130	0.42
Paving	Paving Equipment	2	8.00	132	0.36
Paving	Rollers	2	8.00	80	0.38
Architectural Coating	Air Compressors	1	6.00	78	0.48

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Site Preparation	7	18.00	0.00	0.00	8.30	6.40	20.00	LD_Mix	HDT_Mix	HHDT
Grading	8	20.00	0.00	1,821.00	8.30	6.40	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	272.00	106.00	0.00	8.30	6.40	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	8.30	6.40	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	54.00	0.00	0.00	8.30	6.40	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Water Exposed Area

Reduce Vehicle Speed on Unpaved Roads

3.2 Site Preparation - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					18.0663	0.0000	18.0663	9.9307	0.0000	9.9307			0.0000			0.0000
Off-Road	3.8882	40.4971	21.1543	0.0380		2.0445	2.0445		1.8809	1.8809		3,685.656 9	3,685.656 9	1.1920		3,715.457 3
Total	**3.8882**	**40.4971**	**21.1543**	**0.0380**	**18.0663**	**2.0445**	**20.1107**	**9.9307**	**1.8809**	**11.8116**		**3,685.656 9**	**3,685.656 9**	**1.1920**		**3,715.457 3**

3.2 Site Preparation - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
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
Worker	0.0522	0.0389	0.3822	9.9000e-004	0.1137	7.0000e-004	0.1144	0.0302	6.5000e-004	0.0308		98.8423	98.8423	3.0400e-003		98.9183
Total	**0.0522**	**0.0389**	**0.3822**	**9.9000e-004**	**0.1137**	**7.0000e-004**	**0.1144**	**0.0302**	**6.5000e-004**	**0.0308**		**98.8423**	**98.8423**	**3.0400e-003**		**98.9183**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					8.1298	0.0000	8.1298	4.4688	0.0000	4.4688			0.0000			0.0000
Off-Road	3.8882	40.4971	21.1543	0.0380		2.0445	2.0445		1.8809	1.8809	0.0000	3,685.6569	3,685.6569	1.1920		3,715.4573
Total	**3.8882**	**40.4971**	**21.1543**	**0.0380**	**8.1298**	**2.0445**	**10.1743**	**4.4688**	**1.8809**	**6.3497**	**0.0000**	**3,685.6569**	**3,685.6569**	**1.1920**		**3,715.4573**

3.2 Site Preparation - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
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
Worker	0.0522	0.0389	0.3822	9.9000e-004	0.1137	7.0000e-004	0.1144	0.0302	6.5000e-004	0.0308		98.8423	98.8423	3.0400e-003		98.9183
Total	**0.0522**	**0.0389**	**0.3822**	**9.9000e-004**	**0.1137**	**7.0000e-004**	**0.1144**	**0.0302**	**6.5000e-004**	**0.0308**		**98.8423**	**98.8423**	**3.0400e-003**		**98.9183**

3.3 Grading - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					6.6931	0.0000	6.6931	3.3859	0.0000	3.3859			0.0000			0.0000
Off-Road	4.1912	46.3998	30.8785	0.0620		1.9853	1.9853		1.8265	1.8265		6,007.0434	6,007.0434	1.9428		6,055.6134
Total	**4.1912**	**46.3998**	**30.8785**	**0.0620**	**6.6931**	**1.9853**	**8.6784**	**3.3859**	**1.8265**	**5.2124**		**6,007.0434**	**6,007.0434**	**1.9428**		**6,055.6134**

3.3 Grading - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category						lb/day								lb/day		
Hauling	0.3942	14.3128	4.3534	0.0398	0.9038	0.0561	0.9599	0.2473	0.0536	0.3009		4,458.2948	4,458.2948	0.4220		4,468.8437
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
Worker	0.0580	0.0432	0.4247	1.1000e-003	0.1263	7.8000e-004	0.1271	0.0335	7.2000e-004	0.0342		109.8248	109.8248	3.3800e-003		109.9092
Total	**0.4521**	**14.3560**	**4.7782**	**0.0409**	**1.0301**	**0.0568**	**1.0870**	**0.2808**	**0.0543**	**0.3351**		**4,568.1195**	**4,568.1195**	**0.4253**		**4,578.7529**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category						lb/day								lb/day		
Fugitive Dust					3.0119	0.0000	3.0119	1.5236	0.0000	1.5236			0.0000			0.0000
Off-Road	4.1912	46.3998	30.8785	0.0620		1.9853	1.9853		1.8265	1.8265	0.0000	6,007.0434	6,007.0434	1.9428		6,055.6134
Total	**4.1912**	**46.3998**	**30.8785**	**0.0620**	**3.0119**	**1.9853**	**4.9972**	**1.5236**	**1.8265**	**3.3502**	**0.0000**	**6,007.0434**	**6,007.0434**	**1.9428**		**6,055.6134**

3.3 Grading - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.3942	14.3128	4.3534	0.0398	0.9038	0.0561	0.9599	0.2473	0.0536	0.3009		4,458.2948	4,458.2948	0.4220		4,468.8437
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
Worker	0.0580	0.0432	0.4247	1.1000e-003	0.1263	7.8000e-004	0.1271	0.0335	7.2000e-004	0.0342		109.8248	109.8248	3.3800e-003		109.9092
Total	**0.4521**	**14.3560**	**4.7782**	**0.0409**	**1.0301**	**0.0568**	**1.0870**	**0.2808**	**0.0543**	**0.3351**		**4,568.1195**	**4,568.1195**	**0.4253**		**4,578.7529**

3.4 Building Construction - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.9009	17.4321	16.5752	0.0269		0.9586	0.9586		0.9013	0.9013		2,553.3639	2,553.3639	0.6160		2,568.7643
Total	**1.9009**	**17.4321**	**16.5752**	**0.0269**		**0.9586**	**0.9586**		**0.9013**	**0.9013**		**2,553.3639**	**2,553.3639**	**0.6160**		**2,568.7643**

3.4 Building Construction - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.3432	10.6623	3.4821	0.0251	0.6277	0.0313	0.6590	0.1806	0.0300	0.2106		2,730.102 7	2,730.102 7	0.2015		2,735.139 0
Worker	0.7881	0.5871	5.7761	0.0150	1.7178	0.0106	1.7284	0.4557	9.7600e-003	0.4655		1,493.617 1	1,493.617 1	0.0459		1,494.765 0
Total	**1.1313**	**11.2494**	**9.2582**	**0.0401**	**2.3455**	**0.0419**	**2.3874**	**0.6363**	**0.0397**	**0.6761**		**4,223.719 8**	**4,223.719 8**	**0.2474**		**4,229.904 0**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.9009	17.4321	16.5752	0.0269		0.9586	0.9586		0.9013	0.9013	0.0000	2,553.363 9	2,553.363 9	0.6160		2,568.764 3
Total	**1.9009**	**17.4321**	**16.5752**	**0.0269**		**0.9586**	**0.9586**		**0.9013**	**0.9013**	**0.0000**	**2,553.363 9**	**2,553.363 9**	**0.6160**		**2,568.764 3**

3.4 Building Construction - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.3432	10.6623	3.4821	0.0251	0.6277	0.0313	0.6590	0.1806	0.0300	0.2106		2,730.1027	2,730.1027	0.2015		2,735.1390
Worker	0.7881	0.5871	5.7761	0.0150	1.7178	0.0106	1.7284	0.4557	9.7600e-003	0.4655		1,493.6171	1,493.6171	0.0459		1,494.7650
Total	**1.1313**	**11.2494**	**9.2582**	**0.0401**	**2.3455**	**0.0419**	**2.3874**	**0.6363**	**0.0397**	**0.6761**		**4,223.7198**	**4,223.7198**	**0.2474**		**4,229.9040**

3.4 Building Construction - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.7062	15.6156	16.3634	0.0269		0.8090	0.8090		0.7612	0.7612		2,554.3336	2,554.3336	0.6120		2,569.6322
Total	**1.7062**	**15.6156**	**16.3634**	**0.0269**		**0.8090**	**0.8090**		**0.7612**	**0.7612**		**2,554.3336**	**2,554.3336**	**0.6120**		**2,569.6322**

3.4 Building Construction - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.3157	10.1233	3.2058	0.0248	0.6277	0.0275	0.6552	0.1806	0.0263	0.2069		2,707.387 0	2,707.387 0	0.2041		2,712.488 8
Worker	0.7338	0.5246	5.2629	0.0145	1.7178	0.0103	1.7281	0.4557	9.4800e-003	0.4652		1,440.335 4	1,440.335 4	0.0409		1,441.357 8
Total	**1.0495**	**10.6479**	**8.4687**	**0.0392**	**2.3455**	**0.0378**	**2.3833**	**0.6363**	**0.0358**	**0.6721**		**4,147.722 4**	**4,147.722 4**	**0.2450**		**4,153.846 6**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.7062	15.6156	16.3634	0.0269		0.8090	0.8090		0.7612	0.7612	0.0000	2,554.333 6	2,554.333 6	0.6120		2,569.632 2
Total	**1.7062**	**15.6156**	**16.3634**	**0.0269**		**0.8090**	**0.8090**		**0.7612**	**0.7612**	**0.0000**	**2,554.333 6**	**2,554.333 6**	**0.6120**		**2,569.632 2**

3.4 Building Construction - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.3157	10.1233	3.2058	0.0248	0.6277	0.0275	0.6552	0.1806	0.0263	0.2069		2,707.3870	2,707.3870	0.2041		2,712.4888
Worker	0.7338	0.5246	5.2629	0.0145	1.7178	0.0103	1.7281	0.4557	9.4800e-003	0.4652		1,440.3354	1,440.3354	0.0409		1,441.3578
Total	**1.0495**	**10.6479**	**8.4687**	**0.0392**	**2.3455**	**0.0378**	**2.3833**	**0.6363**	**0.0358**	**0.6721**		**4,147.7224**	**4,147.7224**	**0.2450**		**4,153.8466**

3.5 Paving - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.1028	11.1249	14.5805	0.0228		0.5679	0.5679		0.5225	0.5225		2,207.6603	2,207.6603	0.7140		2,225.5104
Paving	1.2327					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**2.3355**	**11.1249**	**14.5805**	**0.0228**		**0.5679**	**0.5679**		**0.5225**	**0.5225**		**2,207.6603**	**2,207.6603**	**0.7140**		**2,225.5104**

3.5 Paving - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
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
Worker	0.0405	0.0289	0.2902	8.0000e-004	0.0947	5.7000e-004	0.0953	0.0251	5.2000e-004	0.0257		79.4303	79.4303	2.2600e-003		79.4866
Total	**0.0405**	**0.0289**	**0.2902**	**8.0000e-004**	**0.0947**	**5.7000e-004**	**0.0953**	**0.0251**	**5.2000e-004**	**0.0257**		**79.4303**	**79.4303**	**2.2600e-003**		**79.4866**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.1028	11.1249	14.5805	0.0228		0.5679	0.5679		0.5225	0.5225	0.0000	2,207.6603	2,207.6603	0.7140		2,225.5104
Paving	1.2327					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**2.3355**	**11.1249**	**14.5805**	**0.0228**		**0.5679**	**0.5679**		**0.5225**	**0.5225**	**0.0000**	**2,207.6603**	**2,207.6603**	**0.7140**		**2,225.5104**

3.5 Paving - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
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
Worker	0.0405	0.0289	0.2902	8.0000e-004	0.0947	5.7000e-004	0.0953	0.0251	5.2000e-004	0.0257		79.4303	79.4303	2.2600e-003		79.4866
Total	**0.0405**	**0.0289**	**0.2902**	**8.0000e-004**	**0.0947**	**5.7000e-004**	**0.0953**	**0.0251**	**5.2000e-004**	**0.0257**		**79.4303**	**79.4303**	**2.2600e-003**		**79.4866**

3.6 Architectural Coating - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	527.4630					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2045	1.4085	1.8136	2.9700e-003		0.0817	0.0817		0.0817	0.0817		281.4481	281.4481	0.0183		281.9062
Total	**527.6675**	**1.4085**	**1.8136**	**2.9700e-003**		**0.0817**	**0.0817**		**0.0817**	**0.0817**		**281.4481**	**281.4481**	**0.0183**		**281.9062**

3.6 Architectural Coating - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
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
Worker	0.1457	0.1042	1.0449	2.8700e-003	0.3410	2.0400e-003	0.3431	0.0905	1.8800e-003	0.0924		285.9489	285.9489	8.1200e-003		286.1519
Total	**0.1457**	**0.1042**	**1.0449**	**2.8700e-003**	**0.3410**	**2.0400e-003**	**0.3431**	**0.0905**	**1.8800e-003**	**0.0924**		**285.9489**	**285.9489**	**8.1200e-003**		**286.1519**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	527.4630					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2045	1.4085	1.8136	2.9700e-003		0.0817	0.0817		0.0817	0.0817	0.0000	281.4481	281.4481	0.0183		281.9062
Total	**527.6675**	**1.4085**	**1.8136**	**2.9700e-003**		**0.0817**	**0.0817**		**0.0817**	**0.0817**	**0.0000**	**281.4481**	**281.4481**	**0.0183**		**281.9062**

3.6 Architectural Coating - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
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
Worker	0.1457	0.1042	1.0449	2.8700e-003	0.3410	2.0400e-003	0.3431	0.0905	1.8800e-003	0.0924		285.9489	285.9489	8.1200e-003		286.1519
Total	**0.1457**	**0.1042**	**1.0449**	**2.8700e-003**	**0.3410**	**2.0400e-003**	**0.3431**	**0.0905**	**1.8800e-003**	**0.0924**		**285.9489**	**285.9489**	**8.1200e-003**		**286.1519**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	3.5933	30.7674	74.7497	0.2937	26.6145	0.2282	26.8427	7.1064	0.2138	7.3201		30,113.543 2	30,113.543 2	1.1933		30,143.37 67
Unmitigated	3.5933	30.7674	74.7497	0.2937	26.6145	0.2282	26.8427	7.1064	0.2138	7.3201		30,113.543 2	30,113.543 2	1.1933		30,143.37 67

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Parking Lot	0.00	0.00	0.00		
Refrigerated Warehouse-No Rail	1,379.20	1,379.20	1379.20	12,550,697	12,550,697
Total	1,379.20	1,379.20	1,379.20	12,550,697	12,550,697

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
Parking Lot	6.60	5.50	6.40	0.00	0.00	0.00	0	0	0
Refrigerated Warehouse-No Rail	25.00	0.00	0.00	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
Parking Lot	0.563532	0.028682	0.205515	0.123285	0.020921	0.005572	0.017481	0.019425	0.002786	0.002265	0.006886	0.002647	0.001003
Refrigerated Warehouse-No Rail	0.423188	0.211594	0.211594	0.075362	0.000000	0.000000	0.034783	0.043478	0.000000	0.000000	0.000000	0.000000	0.000000

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

Exceed Title 24

Install High Efficiency Lighting

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.0474	0.4309	0.3620	2.5900e-003		0.0328	0.0328		0.0328	0.0328		517.0877	517.0877	9.9100e-003	9.4800e-003	520.1605
NaturalGas Unmitigated	0.0503	0.4573	0.3842	2.7400e-003		0.0348	0.0348		0.0348	0.0348		548.7993	548.7993	0.0105	0.0101	552.0606

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Refrigerated Warehouse-No Rail	4664.79	0.0503	0.4573	0.3842	2.7400e-003		0.0348	0.0348		0.0348	0.0348		548.7993	548.7993	0.0105	0.0101	552.0606
Total		**0.0503**	**0.4573**	**0.3842**	**2.7400e-003**		**0.0348**	**0.0348**		**0.0348**	**0.0348**		**548.7993**	**548.7993**	**0.0105**	**0.0101**	**552.0606**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Refrigerated Warehouse-No Rail	4.39525	0.0474	0.4309	0.3620	2.5900e-003		0.0328	0.0328		0.0328	0.0328		517.0877	517.0877	9.9100e-003	9.4800e-003	520.1605
Total		**0.0474**	**0.4309**	**0.3620**	**2.5900e-003**		**0.0328**	**0.0328**		**0.0328**	**0.0328**		**517.0877**	**517.0877**	**9.9100e-003**	**9.4800e-003**	**520.1605**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	12.5834	8.8000e-004	0.0967	1.0000e-005		3.5000e-004	3.5000e-004		3.5000e-004	3.5000e-004		0.2069	0.2069	5.5000e-004		0.2205
Unmitigated	12.5834	8.8000e-004	0.0967	1.0000e-005		3.5000e-004	3.5000e-004		3.5000e-004	3.5000e-004		0.2069	0.2069	5.5000e-004		0.2205

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	2.8902					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	9.6842					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	8.9900e-003	8.8000e-004	0.0967	1.0000e-005		3.5000e-004	3.5000e-004		3.5000e-004	3.5000e-004		0.2069	0.2069	5.5000e-004		0.2205
Total	**12.5834**	**8.8000e-004**	**0.0967**	**1.0000e-005**		**3.5000e-004**	**3.5000e-004**		**3.5000e-004**	**3.5000e-004**		**0.2069**	**0.2069**	**5.5000e-004**		**0.2205**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	2.8902					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	9.6842					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	8.9900e-003	8.8000e-004	0.0967	1.0000e-005		3.5000e-004	3.5000e-004		3.5000e-004	3.5000e-004		0.2069	0.2069	5.5000e-004		0.2205
Total	**12.5834**	**8.8000e-004**	**0.0967**	**1.0000e-005**		**3.5000e-004**	**3.5000e-004**		**3.5000e-004**	**3.5000e-004**		**0.2069**	**0.2069**	**5.5000e-004**		**0.2205**

7.0 Water Detail

7.1 Mitigation Measures Water

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type
Forklifts	4	24.00	365	89	0.20	CNG

UnMitigated/Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Equipment Type	lb/day										lb/day					
Forklifts	1.3632	12.6588	13.8450	0.0183		0.8386	0.8386		0.7715	0.7715		1,776.370 0	1,776.370 0	0.5745		1,790.732 8
Total	**1.3632**	**12.6588**	**13.8450**	**0.0183**		**0.8386**	**0.8386**		**0.7715**	**0.7715**		**1,776.370 0**	**1,776.370 0**	**0.5745**		**1,790.732 8**

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type
Fire Pump	1	2	50	351	0.73	Diesel

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

10.1 Stationary Sources

Unmitigated/Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Equipment Type	lb/day										lb/day					
Fire Pump - Diesel (300 - 600 HP)	1.1519	3.2199	2.9374	5.5400e-003		0.1695	0.1695		0.1695	0.1695		589.3389	589.3389	0.0826		591.4046
Total	**1.1519**	**3.2199**	**2.9374**	**5.5400e-003**		**0.1695**	**0.1695**		**0.1695**	**0.1695**		**589.3389**	**589.3389**	**0.0826**		**591.4046**

11.0 Vegetation

Arctic Cold Storage and Packing Project

Santa Barbara-North of Santa Ynez County, Winter

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Refrigerated Warehouse-No Rail	449.25	1000sqft	10.31	449,248.00	0
Parking Lot	496.00	Space	9.41	198,400.00	0

1.2 Other Project Characteristics

Urbanization	Rural	**Wind Speed (m/s)**	3.1	**Precipitation Freq (Days)**	37
Climate Zone	4			**Operational Year**	2022
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	328.8	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics - CO2 intensity per 5-year average (PG&E 2015)

Land Use - Approximately 19.72 acres of the project area will consist of impervious surface (structures and paving).

Construction Phase - Construction is expected to begin January 18, 2021 and end February 2, 2022.

Grading - The proposed would include 64,876 cubic yards of cut and 50,311 cubic yards of fill, and would result in approximately 14,565 cubic yards of net cut.

Vehicle Trips - Based on trip generation and vehicle miles traveled prepared for the proposed project

Energy Use - Based on project's estimated energy usage

Water And Wastewater - Indoor and outdoor water use based on project's estimated water usage

Construction Off-road Equipment Mitigation - Compliance with SBCAPCD standard dust control measures

Energy Mitigation - Assuming compliance with 2019 Title 24 standards and use of LED lighting throughout facility

Waste Mitigation -

Operational Off-Road Equipment - The project would utilize four propane forklifts. CNG was chosen as the closest representative fuel type.

Fleet Mix - Fleet trip percentages based on 1,168 employee trips and 212 truck trips

Stationary Sources - Emergency Generators and Fire Pumps - The project would have a diesel fire pump system

Stationary Sources - Process Boilers -

Table Name	Column Name	Default Value	New Value
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	0	15
tblConstructionPhase	NumDays	300.00	228.00
tblConstructionPhase	NumDays	30.00	35.00
tblEnergyUse	LightingElect	1.62	13.14
tblEnergyUse	NT24E	7.99	64.82
tblEnergyUse	T24E	0.14	1.14
tblFleetMix	HHD	0.02	0.04
tblFleetMix	LDA	0.56	0.42
tblFleetMix	LDT1	0.03	0.21
tblFleetMix	LDT2	0.21	0.21
tblFleetMix	LHD1	0.02	0.00

tblFleetMix	LHD2	5.5720e-003	0.00
tblFleetMix	MCY	6.8860e-003	0.00
tblFleetMix	MDV	0.12	0.08
tblFleetMix	MH	1.0030e-003	0.00
tblFleetMix	MHD	0.02	0.03
tblFleetMix	OBUS	2.7860e-003	0.00
tblFleetMix	SBUS	2.6470e-003	0.00
tblFleetMix	UBUS	2.2650e-003	0.00
tblGrading	AcresOfGrading	87.50	19.72
tblGrading	MaterialExported	0.00	14,565.00
tblLandUse	LandUseSquareFeet	449,250.00	449,248.00
tblLandUse	LotAcreage	4.46	9.41
tblOperationalOffRoadEquipment	OperDaysPerYear	260.00	365.00
tblOperationalOffRoadEquipment	OperFuelType	Diesel	CNG
tblOperationalOffRoadEquipment	OperHoursPerDay	8.00	24.00
tblOperationalOffRoadEquipment	OperOffRoadEquipmentNumber	0.00	4.00
tblProjectCharacteristics	CO2IntensityFactor	641.35	328.8
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblStationaryGeneratorsPumpsEF	CH4_EF	0.07	0.07
tblStationaryGeneratorsPumpsEF	ROG_EF	2.2480e-003	2.2477e-003
tblStationaryGeneratorsPumpsUse	HorsePowerValue	0.00	351.00
tblStationaryGeneratorsPumpsUse	HoursPerDay	0.00	2.00
tblStationaryGeneratorsPumpsUse	HoursPerYear	0.00	50.00
tblStationaryGeneratorsPumpsUse	NumberOfEquipment	0.00	1.00
tblVehicleTrips	CC_TL	5.50	0.00
tblVehicleTrips	CNW_TL	6.40	0.00
tblVehicleTrips	CNW_TTP	41.00	0.00

tblVehicleTrips	CW_TL	6.60	25.00
tblVehicleTrips	CW_TTP	59.00	100.00
tblVehicleTrips	DV_TP	5.00	0.00
tblVehicleTrips	PB_TP	3.00	0.00
tblVehicleTrips	PR_TP	92.00	100.00
tblVehicleTrips	ST_TR	1.68	3.07
tblVehicleTrips	SU_TR	1.68	3.07
tblVehicleTrips	WD_TR	1.68	3.07
tblWater	IndoorWaterUseRate	103,889,062.50	82,968,167.10
tblWater	OutdoorWaterUseRate	0.00	1,013,396.00

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2021	4.6608	60.8406	35.8550	0.1024	18.1799	2.0452	20.2251	9.9608	1.8822	11.8424	0.0000	10,511.6620	10,511.6620	2.3764	0.0000	10,571.0714
2022	533.0841	38.9770	43.1115	0.0946	2.7813	1.5005	4.2818	0.7519	1.4049	2.1569	0.0000	9,450.0235	9,450.0235	1.6091	0.0000	9,490.2517
Maximum	**533.0841**	**60.8406**	**43.1115**	**0.1024**	**18.1799**	**2.0452**	**20.2251**	**9.9608**	**1.8822**	**11.8424**	**0.0000**	**10,511.6620**	**10,511.6620**	**2.3764**	**0.0000**	**10,571.0714**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2021	4.6608	60.8406	35.8550	0.1024	8.2435	2.0452	10.2887	4.4990	1.8822	6.3805	0.0000	10,511.6620	10,511.6620	2.3764	0.0000	10,571.0714
2022	533.0841	38.9770	43.1115	0.0946	2.7813	1.5005	4.2818	0.7519	1.4049	2.1569	0.0000	9,450.0235	9,450.0235	1.6091	0.0000	9,490.2517
Maximum	**533.0841**	**60.8406**	**43.1115**	**0.1024**	**8.2435**	**2.0452**	**10.2887**	**4.4990**	**1.8822**	**6.3805**	**0.0000**	**10,511.6620**	**10,511.6620**	**2.3764**	**0.0000**	**10,571.0714**

	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**	**47.40**	**0.00**	**40.55**	**50.98**	**0.00**	**39.02**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	12.5834	8.8000e-004	0.0967	1.0000e-005		3.5000e-004	3.5000e-004		3.5000e-004	3.5000e-004		0.2069	0.2069	5.5000e-004		0.2205
Energy	0.0503	0.4573	0.3842	2.7400e-003		0.0348	0.0348		0.0348	0.0348		548.7993	548.7993	0.0105	0.0101	552.0606
Mobile	3.5171	32.0474	74.4398	0.2882	26.6145	0.2298	26.8443	7.1064	0.2154	7.3217		29,554.6877	29,554.6877	1.1906		29,584.4534
Offroad	1.3632	12.6588	13.8450	0.0183		0.8386	0.8386		0.7715	0.7715		1,776.3700	1,776.3700	0.5745		1,790.7328
Stationary	1.1519	3.2199	2.9374	5.5400e-003		0.1695	0.1695		0.1695	0.1695		589.3389	589.3389	0.0826		591.4046
Total	**18.6658**	**48.3843**	**91.7030**	**0.3148**	**26.6145**	**1.2730**	**27.8874**	**7.1064**	**1.1914**	**8.2978**		**32,469.4028**	**32,469.4028**	**1.8588**	**0.0101**	**32,518.8719**

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	12.5834	8.8000e-004	0.0967	1.0000e-005		3.5000e-004	3.5000e-004		3.5000e-004	3.5000e-004		0.2069	0.2069	5.5000e-004		0.2205
Energy	0.0474	0.4309	0.3620	2.5900e-003		0.0328	0.0328		0.0328	0.0328		517.0877	517.0877	9.9100e-003	9.4800e-003	520.1605
Mobile	3.5171	32.0474	74.4398	0.2882	26.6145	0.2298	26.8443	7.1064	0.2154	7.3217		29,554.6877	29,554.6877	1.1906		29,584.4534
Offroad	1.3632	12.6588	13.8450	0.0183		0.8386	0.8386		0.7715	0.7715		1,776.3700	1,776.3700	0.5745		1,790.7328
Stationary	1.1519	3.2199	2.9374	5.5400e-003		0.1695	0.1695		0.1695	0.1695		589.3389	589.3389	0.0826		591.4046
Total	**18.6629**	**48.3579**	**91.6808**	**0.3147**	**26.6145**	**1.2710**	**27.8854**	**7.1064**	**1.1894**	**8.2958**		**32,437.6912**	**32,437.6912**	**1.8582**	**9.4800e-003**	**32,486.9718**

	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	**0.02**	**0.05**	**0.02**	**0.05**	**0.00**	**0.16**	**0.01**	**0.00**	**0.17**	**0.02**	**0.00**	**0.10**	**0.10**	**0.03**	**5.77**	**0.10**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site Preparation	Site Preparation	1/18/2021	1/29/2021	5	10	
2	Grading	Grading	1/30/2021	3/19/2021	5	35	
3	Building Construction	Building Construction	3/22/2021	2/2/2022	5	228	
4	Paving	Paving	1/6/2022	2/2/2022	5	20	
5	Architectural Coating	Architectural Coating	1/6/2022	2/2/2022	5	20	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 19.72

Acres of Paving: 9.41

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 673,872; Non-Residential Outdoor: 224,624; Striped Parking Area: 11,904 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Site Preparation	Rubber Tired Dozers	3	8.00	247	0.40
Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Grading	Excavators	2	8.00	158	0.38
Grading	Graders	1	8.00	187	0.41
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Grading	Scrapers	2	8.00	367	0.48
Grading	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Building Construction	Cranes	1	7.00	231	0.29
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Building Construction	Welders	1	8.00	46	0.45
Paving	Pavers	2	8.00	130	0.42
Paving	Paving Equipment	2	8.00	132	0.36
Paving	Rollers	2	8.00	80	0.38
Architectural Coating	Air Compressors	1	6.00	78	0.48

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Site Preparation	7	18.00	0.00	0.00	8.30	6.40	20.00	LD_Mix	HDT_Mix	HHDT
Grading	8	20.00	0.00	1,821.00	8.30	6.40	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	272.00	106.00	0.00	8.30	6.40	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	8.30	6.40	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	54.00	0.00	0.00	8.30	6.40	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Water Exposed Area

Reduce Vehicle Speed on Unpaved Roads

3.2 Site Preparation - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					18.0663	0.0000	18.0663	9.9307	0.0000	9.9307			0.0000			0.0000
Off-Road	3.8882	40.4971	21.1543	0.0380		2.0445	2.0445		1.8809	1.8809		3,685.6569	3,685.6569	1.1920		3,715.4573
Total	**3.8882**	**40.4971**	**21.1543**	**0.0380**	**18.0663**	**2.0445**	**20.1107**	**9.9307**	**1.8809**	**11.8116**		**3,685.6569**	**3,685.6569**	**1.1920**		**3,715.4573**

3.2 Site Preparation - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
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
Worker	0.0589	0.0444	0.3961	9.7000e-004	0.1137	7.0000e-004	0.1144	0.0302	6.5000e-004	0.0308		96.5566	96.5566	3.0400e-003		96.6327
Total	**0.0589**	**0.0444**	**0.3961**	**9.7000e-004**	**0.1137**	**7.0000e-004**	**0.1144**	**0.0302**	**6.5000e-004**	**0.0308**		**96.5566**	**96.5566**	**3.0400e-003**		**96.6327**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					8.1298	0.0000	8.1298	4.4688	0.0000	4.4688			0.0000			0.0000
Off-Road	3.8882	40.4971	21.1543	0.0380		2.0445	2.0445		1.8809	1.8809	0.0000	3,685.656 9	3,685.656 9	1.1920		3,715.457 3
Total	**3.8882**	**40.4971**	**21.1543**	**0.0380**	**8.1298**	**2.0445**	**10.1743**	**4.4688**	**1.8809**	**6.3497**	**0.0000**	**3,685.656 9**	**3,685.656 9**	**1.1920**		**3,715.457 3**

3.2 Site Preparation - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
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
Worker	0.0589	0.0444	0.3961	9.7000e-004	0.1137	7.0000e-004	0.1144	0.0302	6.5000e-004	0.0308		96.5566	96.5566	3.0400e-003		96.6327
Total	**0.0589**	**0.0444**	**0.3961**	**9.7000e-004**	**0.1137**	**7.0000e-004**	**0.1144**	**0.0302**	**6.5000e-004**	**0.0308**		**96.5566**	**96.5566**	**3.0400e-003**		**96.6327**

3.3 Grading - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					6.6931	0.0000	6.6931	3.3859	0.0000	3.3859			0.0000			0.0000
Off-Road	4.1912	46.3998	30.8785	0.0620		1.9853	1.9853		1.8265	1.8265		6,007.0434	6,007.0434	1.9428		6,055.6134
Total	**4.1912**	**46.3998**	**30.8785**	**0.0620**	**6.6931**	**1.9853**	**8.6784**	**3.3859**	**1.8265**	**5.2124**		**6,007.0434**	**6,007.0434**	**1.9428**		**6,055.6134**

3.3 Grading - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.4043	14.3914	4.5364	0.0393	0.9038	0.0575	0.9613	0.2473	0.0550	0.3022		4,397.333 4	4,397.333 4	0.4302		4,408.088 3
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
Worker	0.0654	0.0494	0.4402	1.0800e-003	0.1263	7.8000e-004	0.1271	0.0335	7.2000e-004	0.0342		107.2851	107.2851	3.3800e-003		107.3697
Total	**0.4697**	**14.4408**	**4.9765**	**0.0404**	**1.0301**	**0.0583**	**1.0884**	**0.2808**	**0.0557**	**0.3365**		**4,504.618 5**	**4,504.618 5**	**0.4336**		**4,515.458 0**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					3.0119	0.0000	3.0119	1.5236	0.0000	1.5236			0.0000			0.0000
Off-Road	4.1912	46.3998	30.8785	0.0620		1.9853	1.9853		1.8265	1.8265	0.0000	6,007.043 4	6,007.043 4	1.9428		6,055.613 4
Total	**4.1912**	**46.3998**	**30.8785**	**0.0620**	**3.0119**	**1.9853**	**4.9972**	**1.5236**	**1.8265**	**3.3502**	**0.0000**	**6,007.043 4**	**6,007.043 4**	**1.9428**		**6,055.613 4**

3.3 Grading - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.4043	14.3914	4.5364	0.0393	0.9038	0.0575	0.9613	0.2473	0.0550	0.3022		4,397.333 4	4,397.333 4	0.4302		4,408.088 3
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
Worker	0.0654	0.0494	0.4402	1.0800e-003	0.1263	7.8000e-004	0.1271	0.0335	7.2000e-004	0.0342		107.2851	107.2851	3.3800e-003		107.3697
Total	**0.4697**	**14.4408**	**4.9765**	**0.0404**	**1.0301**	**0.0583**	**1.0884**	**0.2808**	**0.0557**	**0.3365**		**4,504.618 5**	**4,504.618 5**	**0.4336**		**4,515.458 0**

3.4 Building Construction - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.9009	17.4321	16.5752	0.0269		0.9586	0.9586		0.9013	0.9013		2,553.363 9	2,553.363 9	0.6160		2,568.764 3
Total	**1.9009**	**17.4321**	**16.5752**	**0.0269**		**0.9586**	**0.9586**		**0.9013**	**0.9013**		**2,553.363 9**	**2,553.363 9**	**0.6160**		**2,568.764 3**

3.4 Building Construction - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.3637	10.6201	3.8341	0.0245	0.6277	0.0329	0.6606	0.1806	0.0315	0.2121		2,665.6716	2,665.6716	0.2108		2,670.9412
Worker	0.8895	0.6716	5.9861	0.0147	1.7178	0.0106	1.7284	0.4557	9.7600e-003	0.4655		1,459.0777	1,459.0777	0.0460		1,460.2280
Total	**1.2532**	**11.2917**	**9.8202**	**0.0391**	**2.3455**	**0.0435**	**2.3890**	**0.6363**	**0.0413**	**0.6776**		**4,124.7493**	**4,124.7493**	**0.2568**		**4,131.1692**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.9009	17.4321	16.5752	0.0269		0.9586	0.9586		0.9013	0.9013	0.0000	2,553.3639	2,553.3639	0.6160		2,568.7643
Total	**1.9009**	**17.4321**	**16.5752**	**0.0269**		**0.9586**	**0.9586**		**0.9013**	**0.9013**	**0.0000**	**2,553.3639**	**2,553.3639**	**0.6160**		**2,568.7643**

3.4 Building Construction - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.3637	10.6201	3.8341	0.0245	0.6277	0.0329	0.6606	0.1806	0.0315	0.2121		2,665.671 6	2,665.671 6	0.2108		2,670.941 2
Worker	0.8895	0.6716	5.9861	0.0147	1.7178	0.0106	1.7284	0.4557	9.7600e-003	0.4655		1,459.077 7	1,459.077 7	0.0460		1,460.228 0
Total	**1.2532**	**11.2917**	**9.8202**	**0.0391**	**2.3455**	**0.0435**	**2.3890**	**0.6363**	**0.0413**	**0.6776**		**4,124.749 3**	**4,124.749 3**	**0.2568**		**4,131.169 2**

3.4 Building Construction - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.7062	15.6156	16.3634	0.0269		0.8090	0.8090		0.7612	0.7612		2,554.333 6	2,554.333 6	0.6120		2,569.632 2
Total	**1.7062**	**15.6156**	**16.3634**	**0.0269**		**0.8090**	**0.8090**		**0.7612**	**0.7612**		**2,554.333 6**	**2,554.333 6**	**0.6120**		**2,569.632 2**

3.4 Building Construction - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.3346	10.0758	3.5336	0.0242	0.6277	0.0290	0.6567	0.1806	0.0277	0.2083		2,642.606 5	2,642.606 5	0.2136		2,647.946 8
Worker	0.8296	0.6000	5.4403	0.0141	1.7178	0.0103	1.7281	0.4557	9.4800e-003	0.4652		1,407.041 6	1,407.041 6	0.0409		1,408.063 6
Total	**1.1643**	**10.6758**	**8.9739**	**0.0383**	**2.3455**	**0.0392**	**2.3847**	**0.6363**	**0.0372**	**0.6735**		**4,049.648 2**	**4,049.648 2**	**0.2545**		**4,056.010 4**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.7062	15.6156	16.3634	0.0269		0.8090	0.8090		0.7612	0.7612	0.0000	2,554.333 6	2,554.333 6	0.6120		2,569.632 2
Total	**1.7062**	**15.6156**	**16.3634**	**0.0269**		**0.8090**	**0.8090**		**0.7612**	**0.7612**	**0.0000**	**2,554.333 6**	**2,554.333 6**	**0.6120**		**2,569.632 2**

3.4 Building Construction - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.3346	10.0758	3.5336	0.0242	0.6277	0.0290	0.6567	0.1806	0.0277	0.2083		2,642.6065	2,642.6065	0.2136		2,647.9468
Worker	0.8296	0.6000	5.4403	0.0141	1.7178	0.0103	1.7281	0.4557	9.4800e-003	0.4652		1,407.0416	1,407.0416	0.0409		1,408.0636
Total	**1.1643**	**10.6758**	**8.9739**	**0.0383**	**2.3455**	**0.0392**	**2.3847**	**0.6363**	**0.0372**	**0.6735**		**4,049.6482**	**4,049.6482**	**0.2545**		**4,056.0104**

3.5 Paving - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.1028	11.1249	14.5805	0.0228		0.5679	0.5679		0.5225	0.5225		2,207.6603	2,207.6603	0.7140		2,225.5104
Paving	1.2327					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**2.3355**	**11.1249**	**14.5805**	**0.0228**		**0.5679**	**0.5679**		**0.5225**	**0.5225**		**2,207.6603**	**2,207.6603**	**0.7140**		**2,225.5104**

3.5 Paving - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
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
Worker	0.0458	0.0331	0.3000	7.8000e-004	0.0947	5.7000e-004	0.0953	0.0251	5.2000e-004	0.0257		77.5942	77.5942	2.2500e-003		77.6506
Total	**0.0458**	**0.0331**	**0.3000**	**7.8000e-004**	**0.0947**	**5.7000e-004**	**0.0953**	**0.0251**	**5.2000e-004**	**0.0257**		**77.5942**	**77.5942**	**2.2500e-003**		**77.6506**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.1028	11.1249	14.5805	0.0228		0.5679	0.5679		0.5225	0.5225	0.0000	2,207.660 3	2,207.660 3	0.7140		2,225.510 4
Paving	1.2327					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**2.3355**	**11.1249**	**14.5805**	**0.0228**		**0.5679**	**0.5679**		**0.5225**	**0.5225**	**0.0000**	**2,207.660 3**	**2,207.660 3**	**0.7140**		**2,225.510 4**

3.5 Paving - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
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
Worker	0.0458	0.0331	0.3000	7.8000e-004	0.0947	5.7000e-004	0.0953	0.0251	5.2000e-004	0.0257		77.5942	77.5942	2.2500e-003		77.6506
Total	**0.0458**	**0.0331**	**0.3000**	**7.8000e-004**	**0.0947**	**5.7000e-004**	**0.0953**	**0.0251**	**5.2000e-004**	**0.0257**		**77.5942**	**77.5942**	**2.2500e-003**		**77.6506**

3.6 Architectural Coating - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	527.4630					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2045	1.4085	1.8136	2.9700e-003		0.0817	0.0817		0.0817	0.0817		281.4481	281.4481	0.0183		281.9062
Total	**527.6675**	**1.4085**	**1.8136**	**2.9700e-003**		**0.0817**	**0.0817**		**0.0817**	**0.0817**		**281.4481**	**281.4481**	**0.0183**		**281.9062**

3.6 Architectural Coating - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
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
Worker	0.1647	0.1191	1.0801	2.8100e-003	0.3410	2.0400e-003	0.3431	0.0905	1.8800e-003	0.0924		279.3392	279.3392	8.1200e-003		279.5420
Total	**0.1647**	**0.1191**	**1.0801**	**2.8100e-003**	**0.3410**	**2.0400e-003**	**0.3431**	**0.0905**	**1.8800e-003**	**0.0924**		**279.3392**	**279.3392**	**8.1200e-003**		**279.5420**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	527.4630					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2045	1.4085	1.8136	2.9700e-003		0.0817	0.0817		0.0817	0.0817	0.0000	281.4481	281.4481	0.0183		281.9062
Total	**527.6675**	**1.4085**	**1.8136**	**2.9700e-003**		**0.0817**	**0.0817**		**0.0817**	**0.0817**	**0.0000**	**281.4481**	**281.4481**	**0.0183**		**281.9062**

3.6 Architectural Coating - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
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
Worker	0.1647	0.1191	1.0801	2.8100e-003	0.3410	2.0400e-003	0.3431	0.0905	1.8800e-003	0.0924		279.3392	279.3392	8.1200e-003		279.5420
Total	**0.1647**	**0.1191**	**1.0801**	**2.8100e-003**	**0.3410**	**2.0400e-003**	**0.3431**	**0.0905**	**1.8800e-003**	**0.0924**		**279.3392**	**279.3392**	**8.1200e-003**		**279.5420**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	3.5171	32.0474	74.4398	0.2882	26.6145	0.2298	26.8443	7.1064	0.2154	7.3217		29,554.6877	29,554.6877	1.1906		29,584.4534
Unmitigated	3.5171	32.0474	74.4398	0.2882	26.6145	0.2298	26.8443	7.1064	0.2154	7.3217		29,554.6877	29,554.6877	1.1906		29,584.4534

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Parking Lot	0.00	0.00	0.00		
Refrigerated Warehouse-No Rail	1,379.20	1,379.20	1379.20	12,550,697	12,550,697
Total	1,379.20	1,379.20	1,379.20	12,550,697	12,550,697

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
Parking Lot	6.60	5.50	6.40	0.00	0.00	0.00	0	0	0
Refrigerated Warehouse-No	25.00	0.00	0.00	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
Parking Lot	0.563532	0.028682	0.205515	0.123285	0.020921	0.005572	0.017481	0.019425	0.002786	0.002265	0.006886	0.002647	0.001003
Refrigerated Warehouse-No Rail	0.423188	0.211594	0.211594	0.075362	0.000000	0.000000	0.034783	0.043478	0.000000	0.000000	0.000000	0.000000	0.000000

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

Exceed Title 24

Install High Efficiency Lighting

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.0474	0.4309	0.3620	2.5900e-003		0.0328	0.0328		0.0328	0.0328		517.0877	517.0877	9.9100e-003	9.4800e-003	520.1605
NaturalGas Unmitigated	0.0503	0.4573	0.3842	2.7400e-003		0.0348	0.0348		0.0348	0.0348		548.7993	548.7993	0.0105	0.0101	552.0606

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Refrigerated Warehouse-No Rail	4664.79	0.0503	0.4573	0.3842	2.7400e-003		0.0348	0.0348		0.0348	0.0348		548.7993	548.7993	0.0105	0.0101	552.0606
Total		**0.0503**	**0.4573**	**0.3842**	**2.7400e-003**		**0.0348**	**0.0348**		**0.0348**	**0.0348**		**548.7993**	**548.7993**	**0.0105**	**0.0101**	**552.0606**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Refrigerated Warehouse-No Rail	4.39525	0.0474	0.4309	0.3620	2.5900e-003		0.0328	0.0328		0.0328	0.0328		517.0877	517.0877	9.9100e-003	9.4800e-003	520.1605
Total		**0.0474**	**0.4309**	**0.3620**	**2.5900e-003**		**0.0328**	**0.0328**		**0.0328**	**0.0328**		**517.0877**	**517.0877**	**9.9100e-003**	**9.4800e-003**	**520.1605**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	12.5834	8.8000e-004	0.0967	1.0000e-005		3.5000e-004	3.5000e-004		3.5000e-004	3.5000e-004		0.2069	0.2069	5.5000e-004		0.2205
Unmitigated	12.5834	8.8000e-004	0.0967	1.0000e-005		3.5000e-004	3.5000e-004		3.5000e-004	3.5000e-004		0.2069	0.2069	5.5000e-004		0.2205

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	2.8902					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	9.6842					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	8.9900e-003	8.8000e-004	0.0967	1.0000e-005		3.5000e-004	3.5000e-004		3.5000e-004	3.5000e-004		0.2069	0.2069	5.5000e-004		0.2205
Total	**12.5834**	**8.8000e-004**	**0.0967**	**1.0000e-005**		**3.5000e-004**	**3.5000e-004**		**3.5000e-004**	**3.5000e-004**		**0.2069**	**0.2069**	**5.5000e-004**		**0.2205**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	2.8902					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	9.6842					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	8.9900e-003	8.8000e-004	0.0967	1.0000e-005		3.5000e-004	3.5000e-004		3.5000e-004	3.5000e-004		0.2069	0.2069	5.5000e-004		0.2205
Total	**12.5834**	**8.8000e-004**	**0.0967**	**1.0000e-005**		**3.5000e-004**	**3.5000e-004**		**3.5000e-004**	**3.5000e-004**		**0.2069**	**0.2069**	**5.5000e-004**		**0.2205**

7.0 Water Detail

7.1 Mitigation Measures Water

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type
Forklifts	4	24.00	365	89	0.20	CNG

UnMitigated/Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Equipment Type	lb/day										lb/day					
Forklifts	1.3632	12.6588	13.8450	0.0183		0.8386	0.8386		0.7715	0.7715		1,776.370 0	1,776.370 0	0.5745		1,790.732 8
Total	**1.3632**	**12.6588**	**13.8450**	**0.0183**		**0.8386**	**0.8386**		**0.7715**	**0.7715**		**1,776.370 0**	**1,776.370 0**	**0.5745**		**1,790.732 8**

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type
Fire Pump	1	2	50	351	0.73	Diesel

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

10.1 Stationary Sources

Unmitigated/Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Equipment Type	lb/day										lb/day					
Fire Pump - Diesel (300 - 600 HP)	1.1519	3.2199	2.9374	5.5400e-003		0.1695	0.1695		0.1695	0.1695		589.3389	589.3389	0.0826		591.4046
Total	**1.1519**	**3.2199**	**2.9374**	**5.5400e-003**		**0.1695**	**0.1695**		**0.1695**	**0.1695**		**589.3389**	**589.3389**	**0.0826**		**591.4046**

11.0 Vegetation

ATTACHMENT C
MOBILE SOURCE EMISSIONS ESTIMATES

LSA

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Peak Harvest Season Trucks					
Building Area & Use	Truck Type	Trucks Per Day	ADT	AM Peak (6-7 AM)	PM Peak (5-6 PM)
Warehouse	Semi-Trucks(a)	30	60	3	4
Processing	40' Vans(a)	24	48	2	2
	Field Trucks(a)	52	104	10	10
Subtotal		76	152	12	12
Total Trucks		*106*	*212*	*15*	*16*

(a) ADT assumes 1 inbound + 1 outbound trip per truck. Peak hour trips based on operational data for arrival and departure times.

Field Truck/Vans Trip Distribution %			Estimated Origin/ Destination	Estimated Average One-Way Trip Length
US 101	North	50%	SLO & Monterey Counties (a)	150 Miles
	South	25%	SB County	40 Miles
Betteravia Rd	East	10%	Local	10 Miles
	West	15%	Local	5 Miles
Warehouse Truck Trip Distribution %			**Estimated Origin/Destination**	**Estimated Average One-Way Trip Length**
US 101	North	50%	Northern California (b)	300 Miles
	South	50%	Southern California/Baja (c)	150 Miles

(a) Assumes 20% from SLO County and 30% from Monterey County

(b) Assumes median trip length between Project site and Crescent City

(c) Assumes median trip length between Project site and Tijuana

Total VMT		**ADT**	% Distrubution		Miles	Total VMT	
Warehouse	Semi-Trucks	60	North	50%	300	9000	150
			South	50%	150	4500	75
Processing	Vans and Field Trucks	152	North	50%	150	11400	75
			South	25%	40	1520	10
			East	10%	10	152	1
			West	15%	5	114	0.75
Employees	Cars	1168		100%	6.6	7708.8	6.6
Total Miles						34395	
Average Trip Length (total miles/ADT)						24.92376812	

Fleet Mix		**Vehicle Class**	**ADT**	**% of ADT**		
Employees	Cars	LDA	1168	50%	584	0.423188406
		LDT1		25%	292	0.211594203
		LDT2		25%	292	0.211594203
Warehouse	Semi-Trucks	T7 Tractor Construction	60	100%	60	0.043478261
Processing	Vans	MDV	48	100%	48	0.034782609
	Field Trucks	T6 Ag	104	100%	104	0.075362319
Total Trips					1380	

Non-Harvest Season Trucks					
Building Area & Use	Truck Type	Trucks Per Day	ADT	AM Peak (6-7 AM)	PM Peak (5-6 PM)
Warehouse	Semi-Trucks(a)	30	60	3	4
Processing	40' Vans(a)	10	20	2	2
	Field Trucks(a)	10	20	2	2
Subtotal		20	40	4	4
Total Trucks			*384*	*27*	*72*

(a) ADT assumes 1 inbound + 1 outbound trip per truck. Peak hour trips based on operational data for arrival and departure times

Field Truck/Vans Trip Distribution %			Estimated Origin/ Destination	Estimated Average One-Way Trip Length
US 101	North	50%	SLO & Monterey Counties (a)	150 Miles
	South	25%	SB County	40 Miles
Betteravia Rd	East	10%	Local	10 Miles
	West	15%	Local	5 Miles

Warehouse Truck Trip Distribution %			Estimated Origin/Destination	Estimated Average One-Way Trip Length
US 101	North	50%	Northern California (b)	300 Miles
	South	50%	Southern California/Baja (c)	150 Miles

(a) Assumes 20% from SLO County and 30% from Monterey County

(b) Assumes median trip length between Project site and Crescent City

(c) Assumes median trip length between Project site and Tijuana

Total VMT		**ADT**	% Distrubution		Miles	Total VMT
Warehouse	Semi-Trucks	60	North	50%	300	9000
			South	50%	150	4500
Processing	Vans and Field Trucks	40	North	50%	150	3000
			South	25%	40	400
			East	10%	10	40
			West	15%	5	30
Employees	Cars	284		100%	6.6	1874.4
Total Miles						18844
Average Trip Length (total miles/ADT)						13.65536

Fleet Mix		**Vehicle Class**	**ADT**	**% of ADT**		
Employees	Cars	LDA	284	50%	142	0.369792
		LDT1		25%	71	0.184896
		LDT2		25%	71	0.184896
Warehouse	Semi-Trucks	T7 Tractor Construction	60	100%	60	0.15625
Processing	Vans	MDV	20	100%	20	0.052083
	Field Trucks	T6 Ag	20	100%	20	0.052083
Total Trips					384	

Non-Harvest

Fleet Mix		Vehicle Class	ADT	% of ADT			ADT	% of ADT				
Employees	Cars	LDA	284	0.5	142	0.369792	652.3333	0.5	326.1667	0.408219	13.65536	18.35053
		LDT1		0.25	71	0.184896		0.25	163.0833	0.204109	24.92377	
		LDT2		0.25	71	0.184896		0.25	163.0833	0.204109		
Warehouse	Semi-Trucks	T7 Tractor Construction	60	1	60	0.15625	60	1	60	0.075094		
Processing	Vans	MDV	20	1	20	0.052083	31.66667	1	31.66667	0.039633		
	Field Trucks	T6 Ag	20	1	20	0.052083	55	1	55	0.068836		
Total Trips					384							
							799		799		1.77852	

Harvest

Fleet Mix		Vehicle Class	ADT	% of ADT		
Employees	Cars	LDA	1168	0.5	584	0.423188
		LDT1		0.25	292	0.211594
		LDT2		0.25	292	0.211594
Warehouse	Semi-Trucks	T7 Tractor Construction	60	1	60	0.043478
Processing	Vans	MDV	48	1	48	0.075362
	Field Trucks	T6 Ag	104	1	104	0.034783
Total Trips					1380	

										Lbs/Day									MT/Day		
Process	Vehicle Type	Miles/Trip	# Vehicles	EMFAC 2011	ADT	% by Type	Fuel Type	% by Fuel Type	Total Miles	NOx	PM2.5	PM2.5 (TW/BW)	PM10	PM10 (TW/BW)	ROG	TOG	CO	SOx	CO_2	CH_4	N_2O
Warehouse	Semi-Trucks	225.0	30	T7 Tractor Construction	60	100%	GAS	0%	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00E+00	0.00
							DSL	100%	13,500	173.91	1.35	1.06	1.42	2.91	6.41	7.30	26.61	0.52	24.76	1.35E-04	0.00
							NG	0%	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00E+00	0.00
							ELEC														
Processing	Vans and Field Trucks	86.8	24	MDV	48	100%	GAS	0%	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00E+00	0.00
							DSL	100%	4,164	0.52	0.05	0.16	0.05	0.41	0.10	0.11	1.68	0.03	1.50	2.09E-06	0.00
							NG														
							ELEC	0%	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00E+00	0.00
			52	T6 Ag	104	100%	GAS	0%	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00E+00	0.00
							DSL	100%	9,022	179.49	6.20	1.17	6.48	2.83	11.89	13.53	29.13	0.20	9.76	2.50E-04	0.00
							NG	0%	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00E+00	0.00
							ELEC														
Employees	Cars	6.6	584	LDA	1168	50%	GAS	50%	1,927	0.49	0.01	0.08	0.01	0.19	1.05	1.11	5.97	0.01	0.53	4.12E-05	0.00
							DSL	25%	964	0.22	0.02	0.04	0.02	0.10	0.03	0.04	0.44	0.00	0.19	6.61E-07	0.00
							NG														
							ELEC	25%	964	0.00	0.00	0.04	0.00	0.10	0.01	0.01	0.00	0.00	0.00	0.00E+00	0.00
				LDT1		25%	GAS	50%	964	0.51	0.01	0.04	0.01	0.10	1.58	1.64	5.23	0.01	0.33	4.48E-05	0.00
							DSL	25%	482	1.59	0.17	0.02	0.18	0.05	0.22	0.29	1.44	0.00	0.20	4.71E-06	0.00
							NG														
							ELEC	0%	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00E+00	0.00
				LDT2		25%	GAS	50%	964	0.84	0.01	0.04	0.01	0.10	1.99	2.07	6.63	0.01	0.36	6.18E-05	0.00
							DSL	25%	482	0.06	0.01	0.02	0.01	0.05	0.01	0.02	0.13	0.00	0.13	3.11E-07	0.00
							NG														
							ELEC	25%	482	0.00	0.00	0.02	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00E+00	0.00
									Total	357.63	7.81	2.67	8.17	6.86	23.30	26.12	77.27	0.79	37.76	5.41E-04	0.01
											PM 2.5 Total	10.48	PM 10 Total	15.03						0.013528	1.73656
																			8816.385	2.66E+00	405.0059
																			CO2e Total	9224.048	

										Lbs/Day									MT/Day		
Process	Vehicle Type	Miles/Trip	# Vehicles	EMFAC 2011	ADT	% by Type	Fuel Type	% by Fuel Type	Total Miles	NOx	PM2.5	PM2.5 (TW/BW)	PM10	PM10 (TW/BW)	ROG	TOG	CO	SOx	CO_2	CH_4	N_2O
Warehouse	Semi-Trucks	225.0	30	T7 Tractor Construction	60	100%	GAS	0%	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00E+00	0.00
							DSL	100%	13,500	173.91	1.35	1.06	1.42	2.91	6.41	7.30	26.61	0.52	24.76	1.35E-04	0.00
							NG	0%	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00E+00	0.00
							ELEC														
Processing	Vans and Field Trucks	86.8	10	MDV	20	100%	GAS	0%	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00E+00	0.00
							DSL	100%	1,735	0.22	0.02	0.07	0.02	0.17	0.04	0.05	0.70	0.01	0.62	8.72E-07	0.00
							NG														
							ELEC	0%	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00E+00	0.00
			10	T6 Ag	20	100%	GAS	0%	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00E+00	0.00
							DSL	100%	1,735	34.52	1.19	0.23	1.25	0.54	2.29	2.60	5.60	0.04	1.88	4.82E-05	0.00
							NG	0%	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00E+00	0.00
							ELEC														
Employees	Cars	6.6	142	LDA	284	50%	GAS	50%	469	0.12	0.00	0.02	0.00	0.05	0.26	0.27	1.45	0.00	0.13	1.00E-05	0.00
							DSL	25%	234	0.05	0.00	0.01	0.00	0.02	0.01	0.01	0.11	0.00	0.05	1.61E-07	0.00
							NG														
							ELEC	25%	234	0.00	0.00	0.01	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00E+00	0.00
				LDT1		25%	GAS	50%	234	0.12	0.00	0.01	0.00	0.02	0.38	0.40	1.27	0.00	0.08	1.09E-05	0.00
							DSL	25%	117	0.39	0.04	0.00	0.04	0.01	0.05	0.07	0.35	0.00	0.05	1.14E-06	0.00
							NG														
							ELEC	25%	117	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00E+00	0.00
				LDT2		25%	GAS	50%	234	0.20	0.00	0.01	0.00	0.02	0.48	0.50	1.61	0.00	0.09	1.50E-05	0.00
							DSL	25%	117	0.01	0.00	0.00	0.00	0.01	0.00	0.00	0.03	0.00	0.03	7.56E-08	0.00
							NG														
							ELEC	25%	117	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00E+00	0.00
									Total	209.55	2.62	1.42	2.74	3.81	9.93	11.21	37.74	0.58	27.69	2.21E-04	0.00
											PM 2.5 Total	4.04	PM 10 Total	6.55						5.54E-03	1.289044

Source: EMFAC2017 (v1.0.3) Emission Rates
Region Type: County
Region: Santa Barbara
Calendar Year: 2022
Season: Annual
Vehicle Classification: EMFAC2011 Categories
Units: miles/day for VMT, trips/day for Trips, g/mile for RUNEX, PMBW and PMTW, g/trip for STREX, HOTSOAK and RUNLOSS, g/vehicle/day for IDLEX, RESTLOSS and DIURN

Region	Calendar	Vehicle Category	Model Ye	Speed	Fuel	Populatio	VMT	Trips	NOx_RUNEX	NOx_IDLEX	NOx_STREX	PM2.5_RUNEX	PM2.5_IDLEX	PM2.5_STREX	PM2.5_PMTW	PM2.5_PMBW	PM10_RUNEX	PM10_IDLEX	PM10_STREX	PM10_PMTW	PM10_PMBW	CO2_RUNEX	CO2_IDLEX	CO2_STREX	CH4_RUNEX	CH4_IDLEX	CH4_STREX	N2O_RUNEX	N2O_IDLEX	N2O_STREX	ROG_RUNEX	ROG_IDLEX	ROG_STREX	ROG_HOTSOAK	ROG_RUNLOSS	ROG_RESTLOSS	ROG_DIURN	TOG_RUNEX	TOG_IDLEX	TOG_STREX	TOG_HOTSOAK	TOG_RUNLOSS	TOG_RESTLOSS	TOG_DIURN	CO_RUNEX	CO_IDLEX	CO_STREX	SOx_RUNEX	SOx_IDLEX	SOx_STREX
SANTA BARBARA	2020	HHDT	Aggregate	Aggregate	GAS																																													
Santa Barbara	2022	T7 tractor construct	Aggregate	Aggregate	Diesel	103.9243	7168.959	469.8376	5.777789187	21.80301479	3.87150825	0.045505225	0.010064356	0	0.009000003	0.026460008	0.04756277	0.010519421	0	0.03600001	0.061740018	1824.97875	4185.390728	0	0.009846335	0.073939328	0	0.286861245	0.657885137	0	0.211988886	1.591893451	0	0	0	0	0	0.24133321	1.812249517	0	0	0	0	0	0.84703857	21.21152301	0	0.017241494	0.039541496	0
SANTA BARBARA	2020	HHDT	Aggregate	Aggregate	NG																																													
Santa Barbara	2022	T6 Ag	Aggregate	Aggregate	Diesel	23.80174	255.0726	104.7277	8.959867195	9.835399693	0.668613654	0.310937813	0.137159435	0	0.003000001	0.055860016	0.324997042	0.143361176	0	0.012000003	0.130340037	1078.427653	663.5833262	0	0.027646953	0.019774635	0	0.169513809	0.104306058	0	0.595231325	0.425742468	0	0	0	0	0	0.677625553	0.484675392	0	0	0	0	0	1.44426552	3.480855771	0	0.01018845	0.006269206	0
Santa Barbara	2022	LDA	Aggregate	Aggregate	Gasoline	156319.5	5603761	727641.1	0.047727167	0	0.220704899	0.001218173	0	0.001869196	0.002000001	0.015750005	0.001324852	0	0.002032816	0.008000002	0.036750011	255.5781023	0	56.65191605	0.002612815	0	0.061907236	0.005011793	0	0.028262172	0.010475591	0	0.289299868	0.127875792	0.25376001	0.221392842	0.229641893	0.015279095	0	0.31674503	0.127875792	0.25376001	0.221392842	0.229641893	0.661404662	0	2.457309691	0.002529153	0	0.000560617
Santa Barbara	2022	LDA	Aggregate	Aggregate	Diesel	2193.939	78720.03	10173.29	0.102715837	0	0	0.007866554	0	0	0.002000001	0.015750005	0.008222245	0	0	0.008000002	0.036750011	201.1239969	0	0	0.000685755	0	0	0.031613891	0	0	0.014763898	0	0	0	0	0	0	0.016807717	0	0	0	0	0	0	0.208473354	0	0	0.001901345	0	0
Santa Barbara	2022	LDA	Aggregate	Aggregate	Electricity	2756.14	112939.8	13707.6	0	0	0	0	0	0	0.002000001	0.015750005	0	0	0	0.008000002	0.036750011	0	0	0	0	0	0	0	0	0	0	0	0	0.004888026	0	0.003124904	0.012334728	0	0	0	0.004888026	0	0.003124904	0.012334728	0	0	0	0	0	0
Santa Barbara	2022	LDT1	Aggregate	Aggregate	Gasoline	17029.6	591852.1	78355.28	0.081675373	0	0.259598885	0.001482849	0	0.002156779	0.002000001	0.015750005	0.00161267	0	0.002345562	0.008000002	0.036750011	297.3743929	0	65.88092347	0.003844521	0	0.070286891	0.006800738	0	0.030097715	0.016195442	0	0.338064044	0.170087961	0.610020958	0.313406972	0.335666514	0.023618944	0	0.370135978	0.170087961	0.610020958	0.313406972	0.335666514	0.900301269	0	2.57925585	0.002942761	0	0.000651945
Santa Barbara	2022	LDT1	Aggregate	Aggregate	Diesel	20.08755	316.4537	64.16141	1.498354416	0	0	0.158685573	0	0	0.002000001	0.015750005	0.165860631	0	0	0.008000002	0.036750011	411.3794019	0	0	0.009768788	0	0	0.064663113	0	0	0.210316248	0	0	0	0	0	0	0.239431066	0	0	0	0	0	0	1.353058131	0	0	0.003889015	0	0
Santa Barbara	2022	LDT1	Aggregate	Aggregate	Electricity	107.6368	4277.413	526.7953	0	0	0	0	0	0	0.002000001	0.015750005	0	0	0	0.008000002	0.036750011	0	0	0	0	0	0	0	0	0	0	0	0	0.004888026	0	0.003124904	0.012334728	0	0	0	0.004888026	0	0.003124904	0.012334728	0	0	0	0	0	0
Santa Barbara	2022	LDT2	Aggregate	Aggregate	Gasoline	67983.46	2269109	308336.2	0.143282816	0	0.418333752	0.001429219	0	0.002064629	0.002000001	0.015750005	0.001554332	0	0.00224532	0.008000002	0.036750011	332.8423283	0	75.5744531	0.005582782	0	0.096609504	0.009832942	0	0.039360638	0.024458216	0	0.488533955	0.203737987	0.709452151	0.400982461	0.410101267	0.035670803	0	0.534881037	0.203737987	0.709452151	0.400982461	0.410101267	1.168587973	0	3.224007337	0.003293745	0	0.00074787
Santa Barbara	2022	LDT2	Aggregate	Aggregate	Diesel	463.905	18212.01	2244.188	0.053709765	0	0	0.005722319	0	0	0.002000001	0.015750005	0.005981057	0	0	0.008000002	0.036750011	272.2647886	0	0	0.000645045	0	0	0.042796233	0	0	0.01388744	0	0	0	0	0	0	0.015809927	0	0	0	0	0	0	0.121887781	0	0	0.002573881	0	0
Santa Barbara	2022	LDT2	Aggregate	Aggregate	Electricity	468.5996	15414.64	2361.987	0	0	0	0	0	0	0.002000001	0.015750005	0	0	0	0.008000002	0.036750011	0	0	0	0	0	0	0	0	0	0	0	0	0.004888026	0	0.003124904	0.012334728	0	0	0	0.004888026	0	0.003124904	0.012334728	0	0	0	0	0	0
Santa Barbara	2022	MDV	Aggregate	Aggregate	Gasoline	49925.91	1649802	225363.9	0.127443886	0	0.4492665	0.001303143	0	0.002025083	0.002000001	0.015750005	0.001417098	0	0.002202001	0.008000002	0.036750011	403.9389627	0	91.65994316	0.005224583	0	0.10497869	0.009550627	0	0.041199232	0.022383297	0	0.536290307	0.188378207	0.59840535	0.394091083	0.367184391	0.03259824	0	0.587161888	0.188378207	0.59840535	0.394091083	0.367184391	1.065774588	0	3.80532595	0.003997303	0	0.000907049
Santa Barbara	2022	MDV	Aggregate	Aggregate	Diesel	1160.091	45204.32	5569.082	0.057065976	0	0	0.005048978	0	0	0.002000001	0.015750005	0.00527727	0	0	0.008000002	0.036750011	359.4228466	0	0	0.000502682	0	0	0.056496266	0	0	0.010822445	0	0	0	0	0	0	0.012320634	0	0	0	0	0	0	0.183509811	0	0	0.003397838	0	0
Santa Barbara	2022	MDV	Aggregate	Aggregate	Electricity	228.9779	7747.384	1163.262	0	0	0	0	0	0	0.002000001	0.015750005	0	0	0	0.008000002	0.036750011	0	0	0	0	0	0	0	0	0	0	0	0	0.004888026	0	0.003124904	0.012334728	0	0	0	0.004888026	0	0.003124904	0.012334728	0	0	0	0	0	0
Santa Barbara	2022	MH	Aggregate	Aggregate	Gasoline	1115.529	9093.687	111.5975	0.602774654	0	0.334927093	0.001882	0	0.000397014	0.003000001	0.055860016	0.002046846	0	0.000431789	0.012000003	0.130340037	1803.992488	0	26.71967083	0.022320277	0	0.033519855	0.033202107	0	0.033304285	0.104066526	0	0.146681058	0.10945034	2.912396881	0.048486416	0.114926857	0.151853631	0	0.160597295	0.10945034	2.912396881	0.048486416	0.114926857	2.840713442	0	3.241571422	0.017851968	0	0.000264413
Santa Barbara	2022	MH	Aggregate	Aggregate	Diesel	374.7128	3361.328	37.47128	4.705957747	0	0	0.114627621	0	0	0.004000001	0.055860016	0.119810573	0	0	0.016000005	0.130340037	1037.879131	0	0	0.005570016	0	0	0.163140146	0	0	0.119919165	0	0	0	0	0	0	0.136519997	0	0	0	0	0	0	0.438488874	0	0	0.00981169	0	0

ATTACHMENT D

BOILER EMISSIONS CALCULATIONS

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Hours/Year	8760	
Heat Input (Hourly)	3.939	MMBTU/hr
Heat Input (Annual)	34,505.64	MMBTU/Yr

Standard							
Emission Factors (lbs/MMBTU)	NOx	CO	ROC	SO_2	PM	CO_2	CO_2 (metric Tons)
NG	0.01	0.30	0.01	0.01	0.01	117.60	0.05
LPG	0.02	0.30	0.01	0.02	0.01	136.60	0.06
Emissions (Lb/Hour)							
NG	0.04	1.17	0.02	0.05	0.03	463.23	0.21
LPG	0.10	1.17	0.02	0.07	0.03	538.07	0.24
Emissions (Lb/Day)							
NG	1.04	28.08	0.51	1.30	0.71	11,117.43	5.04
LPG	2.31	28.08	0.51	1.61	0.71	12,913.62	5.86
Emissions (Lb/Year)							
NG	380	10,248	186	473	259	4,057,863	1840.63
LPG	842	10,248	186	587	259	4,713,470	2138.02

GHG EF from Mfg, Other other emissions factors based on District Rule 361

PM = PM10 = PM2.5

Hours/Year	8760	
Heat Input (Hourly)	11.54	MMBTU/hr
Heat Input (Annual)	101,125	MMBTU/Yr

Standard							
(lbs/MMBTU)	NOx	CO	ROC	SO_2	PM	CO_2	CO_2 (metric Tons)
NG	0.01	0.30	0.01	0.01	0.01	117.60	0.05
LPG	0.01	0.30	0.01	0.02	0.01	136.60	0.06
Emissions (Lb/Hour)							
NG	0.13	3.43	0.06	0.16	0.09	1,357.57	0.62
LPG	0.13	3.43	0.06	0.20	0.09	1,576.91	0.72
Emissions (Lb/Day)							
NG	3.05	82.29	1.50	3.80	2.08	32,581.79	14.78
LPG	3.05	82.29	1.50	4.71	2.08	37,845.85	17.17
Emissions (Lb/Year)							
NG	1,112	30,034	546	1,385	758	11,892,352	5394.34
LPG	1,112	30,034	546	1,719	758	13,813,735	6265.87

GHG EF from Mfg, Other other emissions factors based on District Rule 342

PM = PM10 = PM2.5

ATTACHMENT E

HRA MODEL SNAPSHOTS

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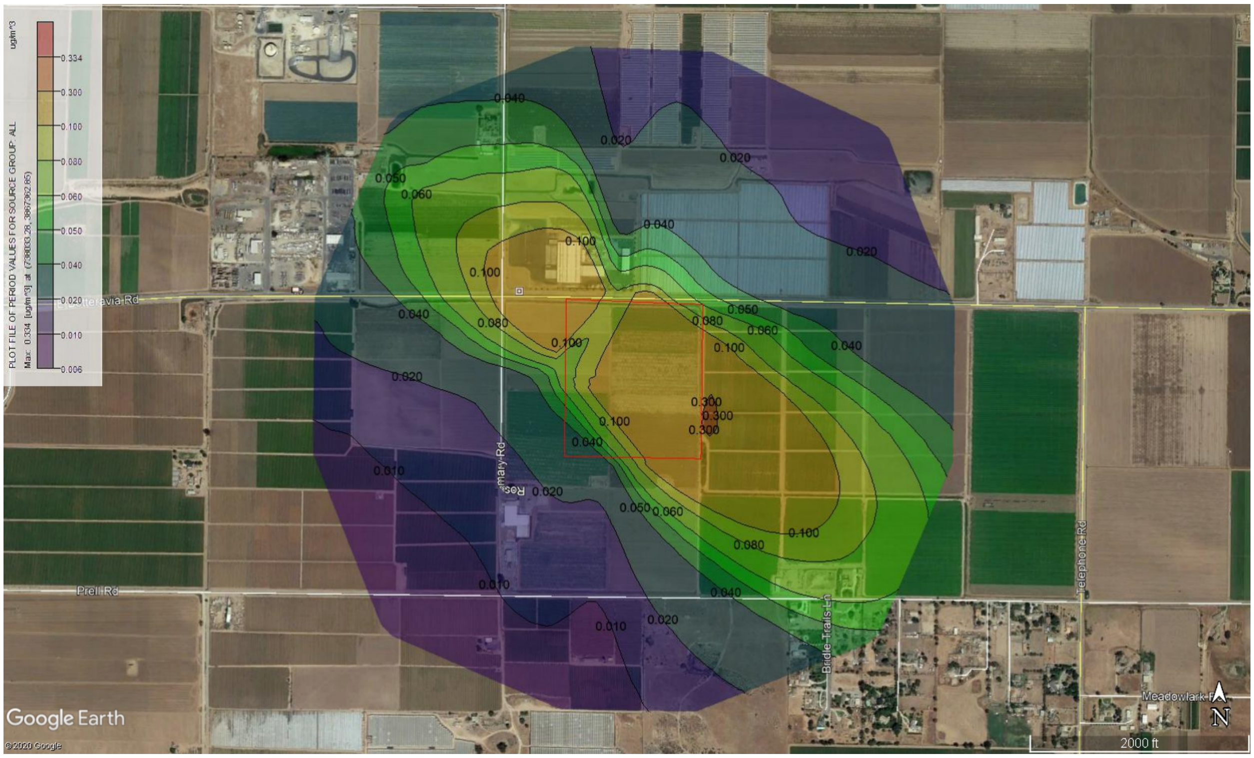
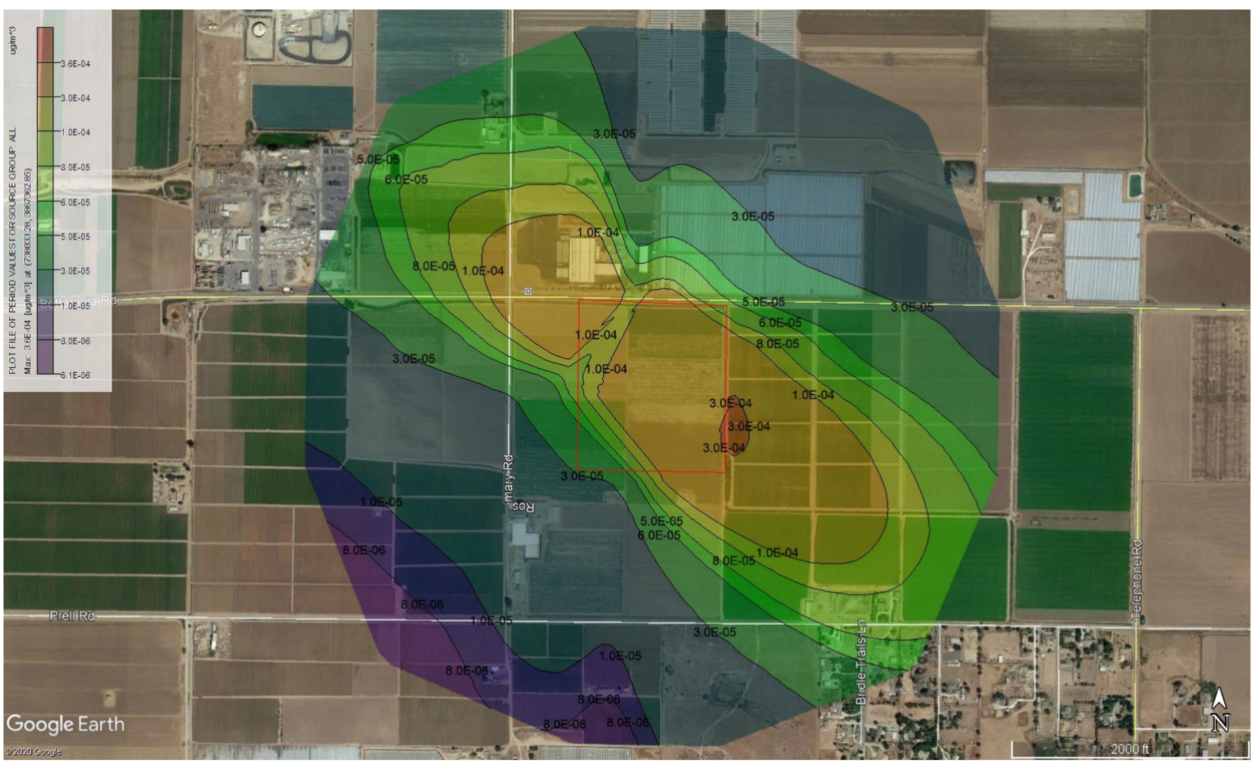
Agricultural Worker Cancer Risk



Agricultural Worker Chronic Hazard Index



$$WAF_{cancer} = \frac{H_{residential}}{H_{source}} * \frac{D_{residential}}{D_{source}} * DF$$

WAF8-hour = 3

where:

	WAF8-hour =	the worker adjustment factor for the 8-hour HI (although it is called the worker adjustment factor, the WAF should also be applied when calculating the 8-hour HI for residential and sensitive receptors, for a non-continuous facility)
24	Hresidential =	the number of hours per day on which the long-term residential concentration is based = 24 hours
1	Hsource =	the number of hours per day that the source operates
7	Dresidential =	the number of days per week on which the long-term residential concentration is based = 7 days
1	Dsource =	the number of days per week that the source operates
0.018	DF =	the discount factor

$$DF = \frac{H_{coincident}}{H_{worker}} * \frac{D_{coincident}}{D_{worker}}$$

DF = **0.017857143**

	DF =	the discount factor
1	Hcoincident =	the number of hours per day that the offsite worker's schedule and the source's emission schedule overlap
8	Hworker =	the number of hours per day that the offsite worker works
1	Dcoincident =	the number of days per week that the offsite worker's schedule and source's emission schedule overlap
7	Dworker =	the number of days per week that the offsite worker works

ATTACHMENT F

DICE SCREENING TOOL

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Santa Barbara County Air Pollution Control District
DICE Screening Tool — August 2018

Engine Data User Inputs

Dispersion
- ○ Urban
- ● Rural

Meteorological Data Set
- ● Santa Maria Airport
- ○ Santa Barbara Airport

Building Downwash
- ● Include Building Downwash
- ○ No Building Downwash

Engine Size
351 bhp

Distance from Source to
Nearest Resident:
734 meters
Nearest Worker:
36 meters

Diesel PM Emission Factor
0.15 g/bhp-hr

Permitted Hours
50 hr/yr

0.07457

DICE Screening Health Risk Outputs		SBCAPCD Board-Approved Significance Thresholds
Cancer Risk at the MEIW:	28.1 / million	≥10.0 / million
Chronic HI at the MEIW:	<0.1	>1.0

HI stands for "hazard index."
MEIR stands for "maximally exposed individual resident."
MEIW stands for "maximally exposed individual worker."

Number	Met Set Name	Year	Met Set Abbrev.
1	Santa Maria Airport	2014	SM
2	Santa Barbara Airport	2014	SB

Engine Data Outputs		
Downwash Radio Button:	1	
Downwash Output:	BDW	
Engine Size Bin Output:	bhp3	
Dispersion Radio Button:	2	
Dispersion Output:	R	
Met Data Radio Button:	1	
Met Data Output:	SM	
Distance Outputs:	Resident	Worker
	734	36
Location of AERSCREEN Concentrations		
	Resident	Worker
Column:	41	9
Row:	9	9

AERSCREEN Results: No Building Downwash		
Max Hourly Concentration:	at MEIR	at MEIW
	72.75	1522

AERSCREEN Results: Building Downwash		
Max Hourly Concentration:	at MEIR	at MEIW
	72.75	54440

AERSCREEN Concentrations With No Building Downwash

Match Input	Engine Size Bin	Dispersion	Met Data Set	Max Hourly Concentration	Distance from source (m)	1	5	10	15	20	25	30	40	50	60	70	80
bhp1RSM	bhp1	Rural	SM	16130	4	1737	15690	9285	5939	4257	3358	2752	1997	1657	1393	1173	1003
bhp1RSB	bhp1	Rural	SB	17360	4	5172	14970	8277	5232	3712	2852	2467	1884	1464	1212	1046	919.3
bhp1USM	bhp1	Urban	SM	15300	4	1668	14900	8276	5349	3583	2848	2339	1710	1321	1083	944.8	829.3
bhp1USB	bhp1	Urban	SB	16560	4	4973	14300	7534	4519	3221	2478	2003	1517	1209	980.4	808.2	701.5
bhp2RSM	bhp2	Rural	SM	9362	4	238.8	9332	6199	4538	3320	2523	2184	1694	1337	1081	938.9	826.2
bhp2RSB	bhp2	Rural	SB	9362	4	255.6	9332	6071	3926	2959	2401	2000	1475	1216	994.3	824.6	711.9
bhp2USM	bhp2	Urban	SM	8953	4	258.6	8932	5876	4045	2985	2273	1826	1423	1146	938.0	778.5	655.0
bhp2USB	bhp2	Urban	SB	8953	4	278.8	8932	5494	3579	2536	2064	1726	1262	966.0	819.0	696.2	596.1
bhp3RSM	bhp3	Rural	SM	5138	5	107.4	5138	3804	2809	2070	1756	1522	1170	915.5	783.2	676.6	582.1
bhp3RSB	bhp3	Rural	SB	5130	5	113.8	5130	3687	2538	2028	1644	1366	1069	862.3	692.5	567.9	484.5
bhp3USM	bhp3	Urban	SM	4938	5	115.2	4938	3617	2664	1857	1560	1352	1046	828.8	666.1	569.7	503.4
bhp3USB	bhp3	Urban	SB	4931	5	124.0	4931	3521	2301	1838	1492	1243	907.8	747.7	614.1	507.9	424.9
bhp4RSM	bhp4	Rural	SM	11550	4	4592	10660	6189	3548	2257	1846	1580	1199	931.7	734.9	612.9	542.0
bhp4RSB	bhp4	Rural	SB	11510	4	7725	10660	5065	2864	2190	1740	1429	1007	812.5	661.8	541.1	447.6
bhp4USM	bhp4	Urban	SM	11050	4	4414	10200	5869	3374	2149	1652	1407	1075	845.2	676.1	549.7	454.1
bhp4USB	bhp4	Urban	SB	11130	4	7432	10200	4847	2601	1989	1583	1302	925.8	699.0	582.4	486.5	409.9
bhp5RSM	bhp5	Rural	SM	1748	9	36.84	1161	1740	1463	1258	1063	937.4	781.3	671.5	574.2	485.7	410.9
bhp5RSB	bhp5	Rural	SB	1782	9	39.84	1671	1746	1458	1181	1045	937.8	761.8	604.2	500.7	442.3	388.1
bhp5USM	bhp5	Urban	SM	1674	9	38.51	1112	1667	1392	1188	1006	852.1	695.7	590.4	511.9	440.2	378.2
bhp5USB	bhp5	Urban	SB	1710	9	44.18	1605	1675	1390	1099	946.9	845.0	688.8	552.9	443.7	377.3	336.2
bhp6RSM	bhp6	Rural	SM	1321	9	37.19	499.2	1304	1078	915.0	798.7	712.8	574.9	461.0	370.3	321.9	287.8
bhp6RSB	bhp6	Rural	SB	1341	9	38.56	922.2	1307	1078	915.0	781.5	668.9	494.9	420.3	365.3	318.2	274.3
bhp6USM	bhp6	Urban	SM	1268	9	37.19	477.9	1252	1032	871.9	758.0	672.8	543.7	437.9	353.6	289.8	257.7
bhp6USB	bhp6	Urban	SB	1287	9	38.56	885.1	1256	1032	871.9	745.3	638.5	473.9	381.6	330.0	289.4	252.8

AERSCREEN Concentrations With Building Downwash

Match Input	Engine Size Bin	Dispersion	Met Data Set	Max Hourly Concentration	Distance from source (m)	1	5	10	15	20	25	30	40	50	60	70	80
bhp1RSM	bhp1	Rural	SM	31770	1	31770	27180	12280	8469	6543	5398	4706	4367	4032	3606	3111	2614
bhp1RSB	bhp1	Rural	SB	31450	1	31450	27230	12580	7925	6381	5299	4470	4343	4048	3606	3102	2601
bhp1USM	bhp1	Urban	SM	31790	1	31790	26600	12230	8469	6342	4895	4108	3451	2985	2511	2221	1941
bhp1USB	bhp1	Urban	SB	26890	1	26890	26460	12220	7226	5679	4579	3802	3106	2593	2315	2070	1798
bhp2RSM	bhp2	Rural	SM	201300	1	201300	25070	15400	11840	8593	7020	5839	4663	3923	3405	3092	2973
bhp2RSB	bhp2	Rural	SB	218800	1	218800	25070	15200	11770	8463	6767	5751	4489	3859	3450	3121	2893
bhp2USM	bhp2	Urban	SM	225200	1	225200	27250	16080	13340	11200	9569	8322	6561	5338	4457	3799	3341
bhp2USB	bhp2	Urban	SB	233200	1	233200	25070	15010	12220	10130	8558	7351	5642	4518	3740	3178	2775
bhp3RSM	bhp3	Rural	SM	185000	2	185000	127600	103000	85250	72210	62250	54440	43080	35290	29670	25450	22190
bhp3RSB	bhp3	Rural	SB	189800	2	189800	132100	101900	81730	68040	57860	50060	39000	31620	26380	22510	19530
bhp3USM	bhp3	Urban	SM	110300	1	110300	26660	15620	12960	10870	9266	8032	6323	5131	4265	3688	3333
bhp3USB	bhp3	Urban	SB	123100	1	123100	24000	14510	11800	9772	8247	7076	5415	4312	3537	2980	2595
bhp4RSM	bhp4	Rural	SM	185200	2	185200	127900	103200	85430	72360	62370	54550	43170	35370	29730	25510	22230
bhp4RSB	bhp4	Rural	SB	190200	2	190200	132400	102100	81890	68180	57970	50170	39080	31680	26440	22550	19670
bhp4USM	bhp4	Urban	SM	193700	1	193700	21520	11830	8917	7269	6304	5521	4351	3533	3001	2606	2290
bhp4USB	bhp4	Urban	SB	203300	1	203300	20490	11980	9348	7547	6285	5314	3950	3063	2455	2020	1698
bhp5RSM	bhp5	Rural	SM	184600	1	184600	127100	102200	84370	71300	61350	53580	42310	34610	29070	24910	21700
bhp5RSB	bhp5	Rural	SB	189000	1	189000	131300	101300	81310	67690	57560	49810	38800	31460	26250	22390	19430
bhp5USM	bhp5	Urban	SM	67260	1	67260	57290	49960	44280	39100	34570	30690	24650	20420	17210	14730	12770
bhp5USB	bhp5	Urban	SB	51770	1	51770	43350	38130	33070	28730	25160	22290	17840	14620	12240	10420	9009
bhp6RSM	bhp6	Rural	SM	195800	3	195800	146700	102300	83720	70340	60260	52550	41490	33930	28500	24430	21280
bhp6RSB	bhp6	Rural	SB	202100	3	202100	153000	107300	85390	70720	60120	52010	40520	32840	27410	23380	20290
bhp6USM	bhp6	Urban	SM	66980	1	66980	56440	49190	43540	38390	33880	30030	24130	19950	16780	14330	12410
bhp6USB	bhp6	Urban	SB	62180	4	62180	60990	44630	38480	33330	28990	25390	19890	16030	13230	11140	9542

Max Hourly Concentration at __ meters from the source

3300	3325	3350	3375	3400	3425	3450	3475	3500	3525	3550	3575	3600	3625	3650	3675	3700	3725	3750	3775	3800	3825	3850	3875	3900	3925	3950	3975
72.06	71.53	71.00	70.48	69.96	69.45	68.94	68.44	67.95	67.46	66.98	66.50	66.04	65.72	65.40	65.08	64.77	64.45	64.14	63.83	63.52	63.22	62.91	62.61	62.31	62.01	61.71	61.42
63.20	62.85	62.49	62.14	61.79	61.44	61.10	60.75	60.41	60.07	59.74	59.40	59.07	58.74	58.42	58.09	57.77	57.45	57.14	56.82	56.51	56.20	55.89	55.58	55.28	54.98	54.68	54.38
21.01	20.79	20.58	20.38	20.18	19.98	19.78	19.59	19.40	19.21	19.03	18.85	18.67	18.50	18.32	18.15	17.99	17.82	17.66	17.50	17.35	17.19	17.04	16.89	16.74	16.60	16.45	16.31
17.54	17.36	17.19	17.01	16.85	16.68	16.51	16.35	16.20	16.04	15.89	15.74	15.59	15.44	15.30	15.16	15.02	14.88	14.74	14.61	14.48	14.35	14.22	14.10	13.97	13.85	13.73	13.62
56.64	56.22	55.81	55.44	55.17	54.90	54.63	54.37	54.10	53.84	53.58	53.31	53.05	52.79	52.54	52.28	52.02	51.77	51.52	51.27	51.02	50.77	50.52	50.28	50.03	49.79	49.55	49.31
50.41	50.22	50.02	49.83	49.65	49.46	49.28	49.09	48.91	48.72	48.54	48.35	48.17	47.98	47.80	47.61	47.43	47.24	47.06	46.88	46.69	46.51	46.33	46.14	45.96	45.78	45.60	45.42
19.53	19.34	19.15	18.96	18.78	18.60	18.42	18.25	18.08	17.91	17.74	17.58	17.42	17.26	17.10	16.95	16.80	16.65	16.50	16.36	16.21	16.07	15.93	15.80	15.66	15.53	15.40	15.27
16.84	16.68	16.51	16.35	16.19	16.04	15.89	15.74	15.59	15.44	15.30	15.16	15.02	14.88	14.75	14.62	14.49	14.36	14.23	14.11	13.98	13.86	13.74	13.62	13.51	13.39	13.28	13.17
36.80	36.67	36.54	36.40	36.27	36.14	36.01	35.88	35.75	35.62	35.49	35.36	35.23	35.10	34.97	34.84	34.71	34.58	34.45	34.32	34.20	34.07	33.94	33.81	33.68	33.55	33.42	33.29
34.50	34.31	34.11	33.92	33.73	33.54	33.36	33.17	32.99	32.80	32.67	32.55	32.43	32.32	32.20	32.08	31.96	31.85	31.73	31.61	31.49	31.38	31.26	31.14	31.03	30.91	30.79	30.68
16.30	16.16	16.01	15.87	15.74	15.60	15.46	15.33	15.20	15.07	14.95	14.82	14.70	14.58	14.46	14.34	14.22	14.11	13.99	13.88	13.77	13.66	13.56	13.45	13.34	13.24	13.14	13.04
13.95	13.82	13.70	13.58	13.46	13.34	13.23	13.11	13.00	12.89	12.78	12.67	12.57	12.46	12.36	12.26	12.16	12.06	11.96	11.86	11.77	11.67	11.58	11.49	11.40	11.31	11.22	11.14
30.57	30.48	30.39	30.29	30.19	30.10	30.00	29.91	29.81	29.71	29.61	29.51	29.42	29.32	29.22	29.12	29.02	28.92	28.82	28.72	28.62	28.52	28.42	28.32	28.22	28.13	28.05	27.97
29.78	29.65	29.52	29.39	29.26	29.13	29.00	28.87	28.74	28.61	28.48	28.36	28.23	28.10	27.98	27.85	27.72	27.60	27.47	27.35	27.23	27.10	26.98	26.86	26.74	26.62	26.50	26.38
13.92	13.81	13.69	13.58	13.47	13.37	13.26	13.15	13.05	12.95	12.85	12.75	12.65	12.55	12.46	12.36	12.27	12.18	12.09	12.00	11.91	11.82	11.73	11.65	11.56	11.48	11.40	11.31
12.13	12.03	11.93	11.83	11.74	11.64	11.55	11.46	11.37	11.28	11.19	11.10	11.01	10.93	10.85	10.76	10.68	10.60	10.52	10.44	10.36	10.29	10.21	10.14	10.06	9.989	9.916	9.845
24.49	24.41	24.33	24.24	24.16	24.08	24.02	23.96	23.90	23.84	23.78	23.72	23.65	23.59	23.53	23.46	23.40	23.34	23.27	23.21	23.14	23.08	23.01	22.94	22.88	22.81	22.74	22.68
24.45	24.35	24.26	24.18	24.10	24.02	23.94	23.86	23.78	23.70	23.62	23.54	23.46	23.38	23.30	23.21	23.13	23.05	22.97	22.89	22.81	22.72	22.64	22.56	22.48	22.40	22.32	22.23
12.48	12.38	12.29	12.19	12.10	12.01	11.91	11.82	11.73	11.65	11.56	11.47	11.39	11.30	11.22	11.14	11.06	10.98	10.90	10.82	10.74	10.67	10.59	10.52	10.44	10.37	10.30	10.23
10.98	10.89	10.81	10.72	10.64	10.56	10.48	10.40	10.32	10.25	10.17	10.09	10.02	9.945	9.872	9.800	9.729	9.659	9.590	9.521	9.453	9.387	9.320	9.255	9.190	9.126	9.063	9.001
11.67	11.67	11.67	11.66	11.66	11.66	11.66	11.66	11.65	11.65	11.65	11.64	11.64	11.63	11.62	11.62	11.61	11.60	11.59	11.59	11.58	11.57	11.56	11.55	11.55	11.54	11.54	11.53
11.73	11.72	11.71	11.70	11.69	11.68	11.67	11.66	11.65	11.65	11.65	11.64	11.64	11.63	11.62	11.62	11.61	11.60	11.59	11.59	11.58	11.57	11.56	11.54	11.53	11.52	11.51	11.50
6.568	6.534	6.500	6.467	6.433	6.400	6.367	6.334	6.302	6.270	6.237	6.205	6.174	6.142	6.111	6.079	6.048	6.018	5.987	5.957	5.926	5.896	5.867	5.837	5.808	5.778	5.749	5.721
5.816	5.785	5.753	5.722	5.690	5.659	5.629	5.598	5.568	5.538	5.508	5.478	5.448	5.419	5.390	5.361	5.332	5.304	5.276	5.248	5.220	5.192	5.165	5.137	5.110	5.083	5.057	5.030

4000	4025	4050	4075	4100	4125	4150	4175	4200	4225	4250	4275	4300	4325	4350	4375	4400	4425	4450	4475	4500	4525	4550
61.12	60.83	60.57	60.33	60.08	59.84	59.59	59.35	59.11	58.87	58.63	58.39	58.15	57.92	57.68	57.45	57.21	56.98	56.75	56.52	56.29	56.06	55.83
54.09	53.80	53.51	53.22	52.93	52.65	52.37	52.09	51.81	51.54	51.26	50.99	50.72	50.46	50.19	49.93	49.67	49.41	49.15	48.90	48.65	48.40	48.15
16.17	16.03	15.90	15.77	15.63	15.50	15.38	15.25	15.13	15.00	14.88	14.76	14.65	14.53	14.41	14.30	14.19	14.08	13.97	13.86	13.76	13.65	13.55
13.50	13.38	13.27	13.16	13.05	12.94	12.83	12.73	12.63	12.52	12.42	12.32	12.22	12.13	12.03	11.94	11.84	11.75	11.66	11.57	11.48	11.40	11.31
49.07	48.83	48.59	48.36	48.12	47.89	47.66	47.43	47.21	46.98	46.75	46.53	46.31	46.09	45.87	45.65	45.43	45.22	45.00	44.79	44.58	44.37	44.19
45.24	45.06	44.88	44.70	44.52	44.35	44.17	43.99	43.82	43.64	43.47	43.29	43.12	42.95	42.78	42.61	42.43	42.26	42.10	41.93	41.76	41.59	41.43
15.14	15.02	14.90	14.77	14.65	14.53	14.42	14.30	14.19	14.08	13.97	13.86	13.75	13.64	13.54	13.43	13.33	13.23	13.13	13.03	12.93	12.84	12.74
13.06	12.95	12.85	12.74	12.64	12.54	12.43	12.34	12.24	12.14	12.04	11.95	11.86	11.77	11.68	11.59	11.50	11.41	11.32	11.24	11.16	11.07	10.99
33.17	33.04	32.91	32.78	32.66	32.53	32.40	32.28	32.15	32.03	31.90	31.78	31.65	31.53	31.41	31.28	31.16	31.04	30.92	30.80	30.68	30.56	30.44
30.56	30.44	30.33	30.21	30.10	29.98	29.87	29.75	29.64	29.52	29.41	29.30	29.19	29.07	28.96	28.85	28.74	28.63	28.52	28.41	28.30	28.19	28.08
12.94	12.84	12.74	12.65	12.55	12.46	12.37	12.28	12.19	12.10	12.01	11.93	11.84	11.76	11.67	11.59	11.51	11.43	11.35	11.27	11.19	11.11	11.04
11.05	10.97	10.88	10.80	10.72	10.64	10.56	10.48	10.41	10.33	10.25	10.18	10.11	10.03	9.962	9.891	9.821	9.752	9.684	9.616	9.550	9.484	9.418
27.89	27.81	27.73	27.65	27.56	27.48	27.40	27.32	27.24	27.16	27.08	27.00	26.92	26.84	26.76	26.68	26.61	26.53	26.45	26.37	26.29	26.21	26.13
26.26	26.14	26.02	25.90	25.78	25.67	25.55	25.44	25.32	25.21	25.09	24.98	24.87	24.76	24.64	24.53	24.42	24.31	24.21	24.10	23.99	23.91	23.84
11.23	11.15	11.08	11.00	10.92	10.84	10.77	10.69	10.62	10.55	10.48	10.41	10.34	10.27	10.20	10.13	10.06	9.997	9.931	9.867	9.802	9.739	9.676
9.774	9.705	9.636	9.568	9.500	9.434	9.368	9.303	9.239	9.176	9.113	9.051	8.990	8.929	8.869	8.810	8.751	8.693	8.636	8.579	8.523	8.468	8.413
22.61	22.54	22.47	22.41	22.34	22.27	22.22	22.17	22.12	22.07	22.01	21.96	21.91	21.86	21.80	21.75	21.69	21.64	21.59	21.53	21.48	21.42	21.37
22.16	22.08	22.00	21.93	21.86	21.78	21.71	21.64	21.56	21.49	21.42	21.34	21.27	21.20	21.12	21.05	20.98	20.91	20.83	20.76	20.69	20.62	20.54
10.16	10.09	10.02	9.955	9.888	9.822	9.757	9.692	9.628	9.565	9.502	9.441	9.379	9.319	9.259	9.200	9.141	9.083	9.026	8.969	8.913	8.857	8.802
8.939	8.878	8.818	8.758	8.699	8.641	8.583	8.526	8.469	8.414	8.358	8.304	8.250	8.196	8.143	8.091	8.039	7.988	7.938	7.887	7.838	7.789	7.740
11.52	11.51	11.50	11.49	11.48	11.47	11.47	11.46	11.45	11.44	11.42	11.41	11.40	11.39	11.38	11.36	11.35	11.34	11.32	11.31	11.30	11.28	11.27
11.48	11.47	11.46	11.45	11.44	11.43	11.42	11.42	11.41	11.40	11.39	11.38	11.37	11.35	11.34	11.33	11.32	11.31	11.30	11.29	11.28	11.26	11.25
5.692	5.663	5.635	5.607	5.579	5.552	5.524	5.497	5.470	5.443	5.416	5.390	5.363	5.337	5.311	5.286	5.260	5.235	5.209	5.184	5.159	5.135	5.110
5.004	4.978	4.952	4.926	4.901	4.876	4.851	4.826	4.801	4.776	4.752	4.728	4.704	4.680	4.656	4.633	4.610	4.587	4.564	4.541	4.518	4.496	4.474

Max Hourly Concentration at __ meters from the source

3300	3325	3350	3375	3400	3425	3450	3475	3500	3525	3550	3575	3600	3625	3650	3675	3700	3725	3750	3775	3800	3825	3850	3875	3900	3925	3950	3975
72.06	71.53	71.00	70.48	69.96	69.45	68.94	68.44	67.95	67.46	66.98	66.50	66.04	65.72	65.40	65.08	64.77	64.45	64.14	63.83	63.52	63.22	62.91	62.61	62.31	62.01	61.71	61.42
63.20	62.85	62.49	62.14	61.79	61.44	61.10	60.75	60.41	60.07	59.74	59.40	59.07	58.74	58.42	58.09	57.77	57.45	57.14	56.82	56.51	56.20	55.89	55.58	55.28	54.98	54.68	54.38
21.01	20.79	20.58	20.38	20.18	19.98	19.78	19.59	19.40	19.21	19.03	18.85	18.67	18.50	18.32	18.15	17.99	17.82	17.66	17.50	17.35	17.19	17.04	16.89	16.74	16.60	16.45	16.31
17.54	17.36	17.19	17.01	16.85	16.68	16.51	16.35	16.20	16.04	15.89	15.74	15.59	15.44	15.30	15.16	15.02	14.88	14.74	14.61	14.48	14.35	14.22	14.10	13.97	13.85	13.73	13.62
56.66	56.24	55.82	55.45	55.18	54.91	54.65	54.38	54.11	53.85	53.59	53.33	53.07	52.81	52.55	52.29	52.04	51.78	51.53	51.28	51.03	50.78	50.53	50.29	50.04	49.80	49.56	49.32
50.43	50.23	50.03	49.85	49.66	49.48	49.29	49.11	48.92	48.74	48.55	48.37	48.18	48.00	47.81	47.63	47.44	47.26	47.07	46.89	46.71	46.52	46.34	46.16	45.97	45.79	45.61	45.43
19.53	19.34	19.15	18.96	18.78	18.60	18.42	18.25	18.08	17.91	17.74	17.58	17.42	17.26	17.10	16.95	16.80	16.65	16.50	16.36	16.22	16.08	15.94	15.80	15.67	15.53	15.40	15.27
16.84	16.68	16.51	16.35	16.20	16.04	15.89	15.74	15.59	15.44	15.30	15.16	15.02	14.88	14.75	14.62	14.49	14.36	14.23	14.11	13.98	13.86	13.74	13.63	13.51	13.40	13.28	13.17
36.80	36.67	36.54	36.40	36.27	36.14	36.01	35.88	35.75	35.62	35.49	35.36	35.23	35.10	34.97	34.84	34.71	34.58	34.45	34.32	34.20	34.07	33.94	33.81	33.68	33.55	33.42	33.29
34.50	34.31	34.11	33.92	33.73	33.54	33.36	33.17	32.99	32.80	32.67	32.55	32.43	32.32	32.20	32.08	31.96	31.85	31.73	31.61	31.49	31.38	31.26	31.14	31.03	30.91	30.79	30.68
16.30	16.16	16.01	15.87	15.74	15.60	15.46	15.33	15.20	15.07	14.95	14.82	14.70	14.58	14.46	14.34	14.22	14.11	13.99	13.88	13.77	13.66	13.56	13.45	13.34	13.24	13.14	13.04
13.95	13.82	13.70	13.58	13.46	13.34	13.23	13.11	13.00	12.89	12.78	12.67	12.57	12.46	12.36	12.26	12.16	12.06	11.96	11.86	11.77	11.67	11.58	11.49	11.40	11.31	11.22	11.14
30.57	30.48	30.39	30.29	30.20	30.10	30.00	29.91	29.81	29.71	29.61	29.52	29.42	29.32	29.22	29.12	29.02	28.92	28.82	28.72	28.62	28.52	28.42	28.32	28.22	28.13	28.05	27.97
29.78	29.65	29.52	29.39	29.26	29.13	29.00	28.87	28.74	28.61	28.48	28.36	28.23	28.10	27.98	27.85	27.72	27.60	27.47	27.35	27.23	27.10	26.98	26.86	26.74	26.62	26.50	26.38
13.92	13.81	13.69	13.58	13.47	13.37	13.26	13.15	13.05	12.95	12.85	12.75	12.65	12.55	12.46	12.36	12.27	12.18	12.09	12.00	11.91	11.82	11.73	11.65	11.56	11.48	11.40	11.31
12.13	12.03	11.93	11.83	11.74	11.64	11.55	11.46	11.37	11.28	11.19	11.10	11.02	10.93	10.85	10.76	10.68	10.60	10.52	10.44	10.36	10.29	10.21	10.14	10.06	9.989	9.916	9.845
24.49	24.41	24.33	24.24	24.16	24.08	24.02	23.96	23.90	23.84	23.78	23.72	23.65	23.59	23.53	23.47	23.40	23.34	23.27	23.21	23.14	23.08	23.01	22.94	22.88	22.81	22.74	22.68
24.45	24.36	24.26	24.18	24.10	24.02	23.94	23.86	23.78	23.70	23.62	23.54	23.46	23.38	23.30	23.22	23.13	23.05	22.97	22.89	22.81	22.73	22.64	22.56	22.48	22.40	22.32	22.23
12.48	12.38	12.29	12.19	12.10	12.01	11.91	11.82	11.73	11.65	11.56	11.47	11.39	11.30	11.22	11.14	11.06	10.98	10.90	10.82	10.74	10.67	10.59	10.52	10.44	10.37	10.30	10.23
10.98	10.89	10.81	10.72	10.64	10.56	10.48	10.40	10.32	10.25	10.17	10.09	10.02	9.946	9.873	9.801	9.730	9.660	9.590	9.522	9.454	9.387	9.321	9.255	9.191	9.127	9.064	9.001
11.67	11.67	11.67	11.66	11.66	11.66	11.66	11.66	11.65	11.65	11.65	11.64	11.64	11.63	11.62	11.62	11.61	11.60	11.59	11.59	11.58	11.57	11.56	11.55	11.55	11.54	11.54	11.53
11.73	11.72	11.71	11.70	11.69	11.68	11.67	11.66	11.65	11.65	11.65	11.64	11.64	11.63	11.62	11.62	11.61	11.60	11.59	11.59	11.58	11.57	11.56	11.54	11.53	11.52	11.51	11.50
6.568	6.534	6.500	6.467	6.433	6.400	6.367	6.334	6.302	6.270	6.237	6.205	6.174	6.142	6.111	6.079	6.048	6.018	5.987	5.957	5.926	5.896	5.867	5.837	5.808	5.778	5.749	5.721
5.816	5.785	5.753	5.722	5.690	5.659	5.629	5.598	5.568	5.538	5.508	5.478	5.448	5.419	5.390	5.361	5.332	5.304	5.276	5.248	5.220	5.192	5.165	5.137	5.110	5.083	5.057	5.030

4000	4025	4050	4075	4100	4125	4150	4175	4200	4225	4250	4275	4300	4325	4350	4375	4400	4425	4450	4475	4500	4525	4550
61.12	60.83	60.57	60.33	60.08	59.84	59.59	59.35	59.11	58.87	58.63	58.39	58.15	57.92	57.68	57.45	57.21	56.98	56.75	56.52	56.29	56.06	55.83
54.09	53.80	53.51	53.22	52.93	52.65	52.37	52.09	51.81	51.54	51.26	50.99	50.72	50.46	50.19	49.93	49.67	49.41	49.15	48.90	48.65	48.40	48.15
16.17	16.03	15.90	15.77	15.63	15.50	15.38	15.25	15.13	15.00	14.88	14.76	14.65	14.53	14.41	14.30	14.19	14.08	13.97	13.86	13.76	13.65	13.55
13.50	13.38	13.27	13.16	13.05	12.94	12.83	12.73	12.63	12.52	12.42	12.32	12.22	12.13	12.03	11.94	11.84	11.75	11.66	11.57	11.48	11.40	11.31
49.08	48.84	48.60	48.37	48.13	47.90	47.67	47.44	47.21	46.99	46.76	46.54	46.32	46.10	45.88	45.66	45.44	45.23	45.01	44.80	44.59	44.38	44.20
45.25	45.07	44.89	44.71	44.54	44.36	44.18	44.00	43.83	43.65	43.48	43.30	43.13	42.96	42.79	42.62	42.44	42.27	42.11	41.94	41.77	41.60	41.44
15.15	15.02	14.90	14.78	14.65	14.54	14.42	14.30	14.19	14.08	13.97	13.86	13.75	13.64	13.54	13.43	13.33	13.23	13.13	13.03	12.93	12.84	12.74
13.06	12.95	12.85	12.74	12.64	12.54	12.44	12.34	12.24	12.14	12.05	11.95	11.86	11.77	11.68	11.59	11.50	11.41	11.33	11.24	11.16	11.07	10.99
33.17	33.04	32.91	32.78	32.66	32.53	32.40	32.28	32.15	32.03	31.90	31.78	31.65	31.53	31.41	31.28	31.16	31.04	30.92	30.80	30.68	30.56	30.44
30.56	30.44	30.33	30.21	30.10	29.98	29.87	29.75	29.64	29.52	29.41	29.30	29.19	29.07	28.96	28.85	28.74	28.63	28.52	28.41	28.30	28.19	28.08
12.94	12.84	12.74	12.65	12.55	12.46	12.37	12.28	12.19	12.10	12.01	11.93	11.84	11.76	11.67	11.59	11.51	11.43	11.35	11.27	11.19	11.11	11.04
11.05	10.97	10.88	10.80	10.72	10.64	10.56	10.48	10.41	10.33	10.25	10.18	10.11	10.03	9.962	9.891	9.821	9.752	9.684	9.616	9.550	9.484	9.418
27.89	27.81	27.73	27.65	27.57	27.48	27.40	27.32	27.24	27.16	27.08	27.00	26.92	26.84	26.76	26.68	26.61	26.53	26.45	26.37	26.29	26.21	26.13
26.26	26.14	26.02	25.90	25.78	25.67	25.55	25.44	25.32	25.21	25.09	24.98	24.87	24.76	24.64	24.53	24.42	24.31	24.21	24.10	23.99	23.91	23.84
11.23	11.15	11.08	11.00	10.92	10.84	10.77	10.69	10.62	10.55	10.48	10.41	10.34	10.27	10.20	10.13	10.06	9.997	9.932	9.867	9.803	9.739	9.676
9.774	9.705	9.636	9.568	9.501	9.434	9.368	9.303	9.239	9.176	9.113	9.051	8.990	8.929	8.869	8.810	8.751	8.693	8.636	8.579	8.523	8.468	8.413
22.61	22.54	22.47	22.41	22.34	22.27	22.22	22.17	22.12	22.07	22.02	21.96	21.91	21.86	21.80	21.75	21.70	21.64	21.59	21.53	21.48	21.42	21.37
22.16	22.08	22.01	21.93	21.86	21.79	21.71	21.64	21.56	21.49	21.42	21.34	21.27	21.20	21.12	21.05	20.98	20.91	20.83	20.76	20.69	20.62	20.54
10.16	10.09	10.02	9.955	9.888	9.822	9.757	9.692	9.628	9.565	9.503	9.441	9.380	9.319	9.259	9.200	9.142	9.084	9.026	8.969	8.913	8.858	8.803
8.939	8.878	8.818	8.758	8.699	8.641	8.583	8.526	8.470	8.414	8.359	8.304	8.250	8.197	8.144	8.091	8.040	7.989	7.938	7.888	7.838	7.789	7.741
11.52	11.51	11.50	11.49	11.48	11.47	11.47	11.46	11.45	11.44	11.42	11.41	11.40	11.39	11.38	11.36	11.35	11.34	11.32	11.31	11.30	11.28	11.27
11.48	11.47	11.46	11.45	11.44	11.43	11.42	11.42	11.41	11.40	11.39	11.38	11.37	11.35	11.34	11.33	11.32	11.31	11.30	11.29	11.28	11.26	11.25
5.692	5.663	5.635	5.607	5.579	5.552	5.524	5.497	5.470	5.443	5.416	5.390	5.363	5.337	5.311	5.286	5.260	5.235	5.209	5.184	5.159	5.135	5.110
5.004	4.978	4.952	4.926	4.901	4.876	4.851	4.826	4.801	4.776	4.752	4.728	4.704	4.680	4.656	4.633	4.610	4.587	4.564	4.541	4.518	4.496	4.474

7400	7450	7500	7550	7600	7650	7700	7750	7800	7850	7900	7950	8000	8050	8100	8150	8200	8250	8300	8350	8400	8450	8500	8550	8600	8650	8700
36.85	36.60	36.36	36.12	35.89	35.65	35.42	35.19	34.96	34.74	34.52	34.30	34.08	33.86	33.65	33.43	33.22	33.02	32.81	32.61	32.40	32.20	32.00	31.81	31.61	31.42	31.23
33.67	33.54	33.42	33.29	33.17	33.04	32.92	32.79	32.67	32.55	32.42	32.30	32.18	32.05	31.93	31.81	31.68	31.56	31.44	31.32	31.20	31.08	30.96	30.84	30.72	30.60	30.48
6.857	6.791	6.727	6.663	6.600	6.539	6.478	6.418	6.359	6.301	6.244	6.188	6.132	6.078	6.024	5.971	5.918	5.867	5.816	5.766	5.716	5.668	5.619	5.572	5.525	5.479	5.434
5.738	5.683	5.629	5.576	5.524	5.472	5.421	5.371	5.322	5.274	5.226	5.179	5.133	5.087	5.042	4.997	4.954	4.911	4.868	4.826	4.785	4.744	4.704	4.664	4.625	4.587	4.549
32.10	31.94	31.77	31.60	31.44	31.28	31.11	30.95	30.79	30.63	30.47	30.32	30.16	30.01	29.85	29.70	29.55	29.40	29.25	29.10	28.95	28.80	28.66	28.51	28.37	28.22	28.08
27.02	26.84	26.65	26.47	26.30	26.12	25.95	25.77	25.60	25.43	25.27	25.10	24.94	24.77	24.61	24.45	24.30	24.14	23.99	23.83	23.73	23.65	23.56	23.48	23.40	23.32	23.24
6.527	6.466	6.405	6.346	6.287	6.229	6.172	6.116	6.061	6.007	5.955	5.903	5.852	5.801	5.752	5.703	5.654	5.607	5.560	5.514	5.468	5.423	5.379	5.335	5.292	5.250	5.208
5.643	5.590	5.538	5.487	5.436	5.386	5.337	5.289	5.241	5.195	5.148	5.103	5.058	5.014	4.970	4.927	4.885	4.843	4.802	4.761	4.721	4.682	4.643	4.604	4.566	4.529	4.492
22.16	22.04	21.92	21.81	21.69	21.57	21.46	21.35	21.23	21.12	21.01	20.90	20.79	20.68	20.57	20.46	20.35	20.25	20.14	20.04	19.93	19.83	19.73	19.63	19.53	19.42	19.33
20.19	20.11	20.03	19.95	19.87	19.78	19.70	19.62	19.54	19.46	19.38	19.30	19.22	19.14	19.06	18.98	18.91	18.83	18.75	18.67	18.59	18.52	18.44	18.36	18.29	18.21	18.14
5.912	5.860	5.809	5.758	5.708	5.659	5.610	5.562	5.515	5.469	5.423	5.378	5.333	5.289	5.246	5.203	5.161	5.120	5.079	5.038	4.999	4.959	4.920	4.882	4.844	4.807	4.770
5.032	4.988	4.944	4.901	4.858	4.816	4.775	4.734	4.694	4.654	4.615	4.577	4.539	4.502	4.465	4.428	4.392	4.357	4.322	4.288	4.254	4.220	4.187	4.155	4.123	4.091	4.060
19.22	19.14	19.06	18.97	18.89	18.81	18.73	18.65	18.57	18.49	18.42	18.34	18.26	18.18	18.10	18.02	17.95	17.87	17.79	17.72	17.64	17.57	17.49	17.42	17.34	17.27	17.19
16.90	16.80	16.70	16.61	16.51	16.41	16.32	16.22	16.13	16.04	15.95	15.89	15.84	15.79	15.74	15.69	15.65	15.60	15.55	15.50	15.45	15.41	15.36	15.31	15.26	15.21	15.17
5.333	5.287	5.243	5.198	5.155	5.112	5.070	5.028	4.987	4.947	4.907	4.867	4.828	4.790	4.752	4.715	4.678	4.642	4.606	4.570	4.535	4.500	4.466	4.432	4.399	4.366	4.334
4.629	4.589	4.550	4.512	4.474	4.437	4.400	4.364	4.329	4.293	4.259	4.224	4.191	4.157	4.124	4.092	4.060	4.028	3.997	3.967	3.936	3.906	3.877	3.848	3.819	3.790	3.762
16.17	16.09	16.01	15.93	15.85	15.78	15.70	15.62	15.54	15.47	15.39	15.33	15.28	15.23	15.19	15.14	15.10	15.05	15.00	14.96	14.91	14.86	14.82	14.77	14.72	14.68	14.63
14.93	14.86	14.79	14.72	14.65	14.58	14.51	14.44	14.37	14.30	14.23	14.16	14.10	14.03	13.96	13.90	13.83	13.76	13.70	13.63	13.57	13.50	13.44	13.38	13.31	13.25	13.19
4.936	4.895	4.855	4.815	4.775	4.736	4.698	4.660	4.623	4.586	4.550	4.514	4.478	4.444	4.409	4.375	4.341	4.308	4.276	4.243	4.211	4.180	4.149	4.118	4.088	4.058	4.028
4.335	4.299	4.264	4.229	4.194	4.160	4.126	4.093	4.061	4.028	3.997	3.965	3.934	3.904	3.874	3.844	3.814	3.785	3.757	3.728	3.700	3.673	3.645	3.618	3.592	3.565	3.539
9.501	9.474	9.446	9.417	9.389	9.361	9.332	9.304	9.275	9.246	9.218	9.189	9.160	9.138	9.116	9.094	9.072	9.050	9.027	9.005	8.982	8.959	8.937	8.914	8.891	8.868	8.844
9.353	9.319	9.284	9.250	9.215	9.181	9.146	9.112	9.079	9.047	9.015	8.984	8.953	8.922	8.891	8.860	8.829	8.798	8.767	8.736	8.705	8.675	8.644	8.613	8.583	8.552	8.521
3.181	3.158	3.135	3.113	3.091	3.069	3.048	3.027	3.006	2.985	2.965	2.944	2.924	2.905	2.885	2.866	2.847	2.828	2.809	2.791	2.772	2.754	2.736	2.719	2.701	2.684	2.667
2.751	2.731	2.712	2.692	2.673	2.654	2.635	2.616	2.598	2.580	2.562	2.544	2.526	2.509	2.492	2.475	2.458	2.442	2.425	2.409	2.393	2.377	2.361	2.346	2.331	2.315	2.300

8750	8800	8850	8900	8950	9000	9050	9100	9150	9200	9250	9300	9350	9400	9450	9500	9550	9600	9650	9700	9750	9800	9850	9900	9950	10000
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
4.029	3.998	3.968	3.938	3.909	3.880	3.852	3.823	3.796	3.768	3.741	3.714	3.688	3.661	3.636	3.610	3.585	3.560	3.535	3.511	3.487	3.463	3.440	3.416	3.393	3.370
17.12	17.05	16.97	16.90	16.83	16.76	16.69	16.61	16.54	16.47	16.40	16.33	16.26	16.20	16.13	16.06	15.99	15.92	15.86	15.79	15.72	15.66	15.59	15.53	15.46	15.40
15.12	15.07	15.02	14.97	14.93	14.88	14.83	14.78	14.74	14.69	14.64	14.59	14.55	14.50	14.45	14.40	14.36	14.32	14.27	14.23	14.19	14.14	14.10	14.05	14.01	13.97
4.302	4.270	4.239	4.208	4.177	4.147	4.117	4.088	4.059	4.030	4.002	3.973	3.946	3.918	3.891	3.864	3.838	3.812	3.786	3.760	3.735	3.710	3.685	3.661	3.636	3.613
3.735	3.707	3.680	3.654	3.627	3.601	3.576	3.550	3.525	3.500	3.475	3.451	3.427	3.403	3.380	3.356	3.333	3.311	3.288	3.266	3.244	3.222	3.201	3.180	3.159	3.138
14.58	14.54	14.49	14.44	14.40	14.35	14.30	14.26	14.21	14.16	14.12	14.07	14.03	13.98	13.93	13.89	13.84	13.80	13.75	13.71	13.66	13.62	13.57	13.53	13.48	13.44
13.13	13.06	13.00	12.94	12.88	12.82	12.76	12.70	12.64	12.58	12.53	12.47	12.41	12.35	12.30	12.24	12.18	12.13	12.07	12.02	11.96	11.91	11.85	11.80	11.75	11.69
3.999	3.970	3.942	3.913	3.886	3.858	3.831	3.804	3.778	3.751	3.725	3.700	3.674	3.649	3.625	3.600	3.576	3.552	3.528	3.505	3.482	3.459	3.436	3.414	3.392	3.370
3.514	3.488	3.463	3.439	3.414	3.390	3.366	3.342	3.319	3.296	3.273	3.251	3.229	3.207	3.185	3.163	3.142	3.121	3.100	3.080	3.059	3.039	3.019	3.000	2.980	2.961
8.821	8.798	8.775	8.751	8.728	8.704	8.681	8.657	8.633	8.610	8.586	8.562	8.539	8.515	8.491	8.467	8.444	8.420	8.396	8.372	8.348	8.325	8.301	8.277	8.255	8.236
8.491	8.461	8.430	8.400	8.370	8.340	8.310	8.280	8.250	8.220	8.190	8.161	8.131	8.101	8.072	8.043	8.014	7.985	7.956	7.927	7.898	7.869	7.841	7.812	7.784	7.756
2.650	2.633	2.616	2.600	2.584	2.568	2.552	2.536	2.520	2.505	2.490	2.475	2.460	2.445	2.430	2.416	2.401	2.387	2.373	2.359	2.345	2.332	2.318	2.305	2.292	2.279
2.286	2.271	2.256	2.242	2.228	2.214	2.200	2.186	2.173	2.159	2.146	2.133	2.120	2.107	2.094	2.081	2.069	2.056	2.044	2.032	2.020	2.008	1.996	1.985	1.973	1.962

7400	7450	7500	7550	7600	7650	7700	7750	7800	7850	7900	7950	8000	8050	8100	8150	8200	8250	8300	8350	8400	8450	8500	8550	8600	8650	8700
36.85	36.60	36.36	36.12	35.89	35.65	35.42	35.19	34.96	34.74	34.52	34.30	34.08	33.86	33.65	33.43	33.22	33.02	32.81	32.61	32.40	32.20	32.00	31.81	31.61	31.42	31.23
33.67	33.54	33.42	33.29	33.17	33.04	32.92	32.79	32.67	32.55	32.42	32.30	32.18	32.05	31.93	31.81	31.68	31.56	31.44	31.32	31.20	31.08	30.96	30.84	30.72	30.60	30.48
6.857	6.791	6.727	6.663	6.600	6.539	6.478	6.418	6.359	6.301	6.244	6.188	6.132	6.078	6.024	5.971	5.918	5.867	5.816	5.766	5.716	5.668	5.619	5.572	5.525	5.479	5.434
5.738	5.683	5.629	5.576	5.524	5.472	5.421	5.371	5.322	5.274	5.226	5.179	5.133	5.087	5.042	4.997	4.954	4.911	4.868	4.826	4.785	4.744	4.704	4.664	4.625	4.587	4.549
32.11	31.94	31.78	31.61	31.45	31.28	31.12	30.96	30.80	30.64	30.48	30.32	30.17	30.01	29.86	29.70	29.55	29.40	29.25	29.10	28.95	28.81	28.66	28.52	28.37	28.23	28.09
27.02	26.84	26.66	26.48	26.30	26.12	25.95	25.78	25.60	25.44	25.27	25.10	24.94	24.78	24.62	24.46	24.30	24.14	23.99	23.83	23.73	23.65	23.57	23.49	23.41	23.33	23.25
6.528	6.466	6.406	6.346	6.288	6.230	6.173	6.117	6.062	6.008	5.955	5.903	5.852	5.801	5.752	5.703	5.654	5.607	5.560	5.514	5.468	5.423	5.379	5.336	5.293	5.250	5.208
5.644	5.591	5.538	5.487	5.437	5.387	5.338	5.289	5.242	5.195	5.149	5.103	5.058	5.014	4.970	4.927	4.885	4.843	4.802	4.761	4.721	4.682	4.643	4.604	4.567	4.529	4.492
22.16	22.04	21.92	21.81	21.69	21.57	21.46	21.35	21.23	21.12	21.01	20.90	20.79	20.68	20.57	20.46	20.35	20.25	20.14	20.04	19.93	19.83	19.73	19.63	19.53	19.42	19.33
20.19	20.11	20.03	19.95	19.87	19.78	19.70	19.62	19.54	19.46	19.38	19.30	19.22	19.14	19.06	18.98	18.91	18.83	18.75	18.67	18.59	18.52	18.44	18.36	18.29	18.21	18.14
5.912	5.860	5.809	5.758	5.708	5.659	5.610	5.562	5.515	5.469	5.423	5.378	5.333	5.289	5.246	5.203	5.161	5.120	5.079	5.038	4.999	4.959	4.920	4.882	4.844	4.807	4.770
5.032	4.988	4.944	4.901	4.858	4.816	4.775	4.734	4.694	4.654	4.615	4.577	4.539	4.502	4.465	4.428	4.392	4.357	4.322	4.288	4.254	4.220	4.187	4.155	4.123	4.091	4.060
19.22	19.14	19.06	18.97	18.89	18.81	18.73	18.65	18.57	18.49	18.42	18.34	18.26	18.18	18.10	18.02	17.95	17.87	17.79	17.72	17.64	17.57	17.49	17.42	17.34	17.27	17.19
16.90	16.80	16.70	16.61	16.51	16.41	16.32	16.22	16.13	16.04	15.95	15.89	15.84	15.79	15.74	15.70	15.65	15.60	15.55	15.50	15.45	15.41	15.36	15.31	15.26	15.21	15.17
5.333	5.287	5.243	5.198	5.155	5.112	5.070	5.028	4.987	4.947	4.907	4.867	4.828	4.790	4.752	4.715	4.678	4.642	4.606	4.570	4.535	4.500	4.466	4.432	4.399	4.366	4.334
4.629	4.589	4.550	4.512	4.474	4.437	4.400	4.364	4.329	4.293	4.259	4.224	4.191	4.157	4.124	4.092	4.060	4.029	3.997	3.967	3.936	3.906	3.877	3.848	3.819	3.790	3.762
16.17	16.09	16.01	15.93	15.85	15.78	15.70	15.62	15.54	15.47	15.39	15.33	15.28	15.24	15.19	15.14	15.10	15.05	15.00	14.96	14.91	14.86	14.82	14.77	14.72	14.68	14.63
14.93	14.86	14.79	14.72	14.65	14.58	14.51	14.44	14.37	14.30	14.23	14.16	14.10	14.03	13.96	13.90	13.83	13.76	13.70	13.63	13.57	13.50	13.44	13.38	13.31	13.25	13.19
4.936	4.895	4.855	4.815	4.775	4.736	4.698	4.660	4.623	4.586	4.550	4.514	4.479	4.444	4.409	4.375	4.342	4.308	4.276	4.243	4.212	4.180	4.149	4.118	4.088	4.058	4.028
4.335	4.299	4.264	4.229	4.194	4.160	4.127	4.093	4.061	4.029	3.997	3.965	3.934	3.904	3.874	3.844	3.815	3.785	3.757	3.728	3.700	3.673	3.645	3.618	3.592	3.565	3.539
9.501	9.474	9.446	9.417	9.389	9.361	9.332	9.304	9.275	9.246	9.218	9.189	9.160	9.138	9.116	9.094	9.072	9.050	9.027	9.005	8.982	8.959	8.937	8.914	8.891	8.868	8.844
9.353	9.319	9.284	9.250	9.215	9.181	9.146	9.112	9.079	9.047	9.015	8.984	8.953	8.922	8.891	8.860	8.829	8.798	8.767	8.736	8.705	8.675	8.644	8.613	8.583	8.552	8.521
3.181	3.158	3.135	3.113	3.091	3.069	3.048	3.027	3.006	2.985	2.965	2.944	2.924	2.905	2.885	2.866	2.847	2.828	2.809	2.791	2.772	2.754	2.736	2.719	2.701	2.684	2.667
2.751	2.731	2.712	2.692	2.673	2.654	2.635	2.616	2.598	2.580	2.562	2.544	2.526	2.509	2.492	2.475	2.458	2.442	2.425	2.409	2.393	2.377	2.361	2.346	2.331	2.315	2.300

8750	8800	8850	8900	8950	9000	9050	9100	9150	9200	9250	9300	9350	9400	9450	9500	9550	9600	9650	9700	9750	9800	9850	9900	9950	10000
31.04	30.85	30.67	30.48	30.30	30.12	29.94	29.76	29.59	29.41	29.24	29.09	28.98	28.87	28.75	28.64	28.53	28.43	28.33	28.23	28.14	28.04	27.94	27.84	27.75	27.65
30.36	30.25	30.13	30.01	29.90	29.78	29.66	29.55	29.43	29.32	29.20	29.09	28.98	28.87	28.75	28.64	28.53	28.42	28.31	28.20	28.09	27.98	27.87	27.76	27.66	27.55
5.389	5.344	5.301	5.258	5.215	5.173	5.132	5.091	5.050	5.010	4.971	4.932	4.894	4.856	4.819	4.782	4.745	4.709	4.674	4.638	4.604	4.569	4.536	4.502	4.469	4.436
4.511	4.474	4.438	4.402	4.366	4.331	4.296	4.262	4.228	4.195	4.162	4.130	4.098	4.066	4.035	4.004	3.973	3.943	3.913	3.884	3.855	3.826	3.798	3.770	3.742	3.715
27.94	27.80	27.66	27.53	27.39	27.25	27.12	26.98	26.85	26.72	26.58	26.45	26.32	26.19	26.07	25.94	25.81	25.69	25.56	25.44	25.32	25.19	25.07	24.95	24.83	24.71
23.17	23.09	23.01	22.93	22.85	22.77	22.69	22.62	22.54	22.46	22.38	22.30	22.22	22.15	22.07	21.99	21.91	21.84	21.76	21.68	21.61	21.53	21.46	21.38	21.31	21.23
5.167	5.126	5.086	5.047	5.008	4.969	4.931	4.894	4.857	4.820	4.784	4.749	4.713	4.679	4.645	4.611	4.578	4.545	4.511	4.479	4.446	4.414	4.382	4.351	4.320	4.290
4.456	4.420	4.384	4.350	4.315	4.281	4.247	4.214	4.181	4.149	4.117	4.085	4.054	4.023	3.993	3.963	3.933	3.904	3.875	3.846	3.818	3.790	3.763	3.735	3.709	3.682
19.23	19.13	19.03	18.93	18.84	18.74	18.65	18.59	18.53	18.47	18.40	18.34	18.28	18.22	18.16	18.10	18.04	17.98	17.92	17.87	17.81	17.75	17.69	17.63	17.58	17.53
18.06	17.99	17.91	17.84	17.76	17.69	17.62	17.54	17.47	17.40	17.33	17.25	17.18	17.11	17.04	16.97	16.90	16.83	16.76	16.69	16.63	16.56	16.49	16.42	16.36	16.29
4.734	4.698	4.663	4.628	4.593	4.559	4.526	4.492	4.460	4.427	4.395	4.364	4.333	4.302	4.271	4.241	4.211	4.181	4.152	4.123	4.094	4.066	4.038	4.010	3.983	3.956
4.029	3.998	3.968	3.938	3.909	3.880	3.852	3.823	3.796	3.768	3.741	3.714	3.688	3.661	3.636	3.610	3.585	3.560	3.535	3.511	3.487	3.463	3.440	3.416	3.393	3.370
17.12	17.05	16.97	16.90	16.83	16.76	16.69	16.61	16.54	16.47	16.40	16.33	16.26	16.20	16.13	16.06	15.99	15.92	15.86	15.79	15.72	15.66	15.59	15.53	15.46	15.40
15.12	15.07	15.02	14.97	14.93	14.88	14.83	14.78	14.74	14.69	14.64	14.59	14.55	14.50	14.45	14.40	14.36	14.32	14.27	14.23	14.19	14.14	14.10	14.05	14.01	13.97
4.302	4.270	4.239	4.208	4.177	4.147	4.117	4.088	4.059	4.030	4.002	3.973	3.946	3.918	3.891	3.864	3.838	3.812	3.786	3.760	3.735	3.710	3.685	3.661	3.636	3.613
3.735	3.707	3.680	3.654	3.627	3.601	3.576	3.550	3.525	3.500	3.475	3.451	3.427	3.403	3.380	3.356	3.333	3.311	3.288	3.266	3.244	3.222	3.201	3.180	3.159	3.138
14.58	14.54	14.49	14.44	14.40	14.35	14.30	14.26	14.21	14.16	14.12	14.07	14.03	13.98	13.93	13.89	13.84	13.80	13.75	13.71	13.66	13.62	13.57	13.53	13.48	13.44
13.13	13.06	13.00	12.94	12.88	12.82	12.76	12.70	12.64	12.58	12.53	12.47	12.41	12.35	12.30	12.24	12.18	12.13	12.07	12.02	11.96	11.91	11.85	11.80	11.75	11.69
3.999	3.970	3.942	3.914	3.886	3.858	3.831	3.804	3.778	3.751	3.725	3.700	3.674	3.649	3.625	3.600	3.576	3.552	3.528	3.505	3.482	3.459	3.436	3.414	3.392	3.370
3.514	3.488	3.463	3.439	3.414	3.390	3.366	3.343	3.319	3.296	3.273	3.251	3.229	3.207	3.185	3.163	3.142	3.121	3.100	3.080	3.059	3.039	3.019	3.000	2.980	2.961
8.821	8.798	8.775	8.751	8.728	8.704	8.681	8.657	8.633	8.610	8.586	8.562	8.539	8.515	8.491	8.467	8.444	8.420	8.396	8.372	8.348	8.325	8.301	8.277	8.255	8.236
8.491	8.461	8.430	8.400	8.370	8.340	8.310	8.280	8.250	8.220	8.190	8.161	8.131	8.101	8.072	8.043	8.014	7.985	7.956	7.927	7.898	7.869	7.841	7.812	7.784	7.756
2.650	2.633	2.616	2.600	2.584	2.568	2.552	2.536	2.520	2.505	2.490	2.475	2.460	2.445	2.430	2.416	2.401	2.387	2.373	2.359	2.345	2.332	2.318	2.305	2.292	2.279
2.286	2.271	2.256	2.242	2.228	2.214	2.200	2.186	2.173	2.159	2.146	2.133	2.120	2.107	2.094	2.081	2.069	2.056	2.044	2.032	2.020	2.008	1.996	1.985	1.973	1.962

User Inputs		
Engine bhp (BHP) =	351	bhp
Diesel PM EF (EF_{DPM}) =	0.15	g/bhp-hr
Permitted Hours (H_{Annual}) =	50	hr/yr
AERSCREEN Results		
	at MEIR	at MEIW
Max Hourly Concentration ($C_{AERSCREEN}$) =	72.75	54440
Calculations		
Diesel PM Emissions =	5.80E+00	lb/yr
MEIR Annual Concentration =	0.00061	μg/m^3
MEIW Annual Concentration =	0.45444	μg/m^3
Risk Data		
Residential Cancer Risk Factor ($F_{resident}$) =	759.16	
Worker Cancer Risk Factor (F_{worker}) =	61.888	
Diesel PM Chronic REL =	5.0	

Risk Results	
Cancer Risk at MEIR:	0.46 / million
Cancer Risk at MEIW:	28.12 / million
Chronic HI at MEIR:	1.21E-04
Chronic HI at MEIW:	9.09E-02

ATTACHMENT G

RECEPTOR LOCATIONS

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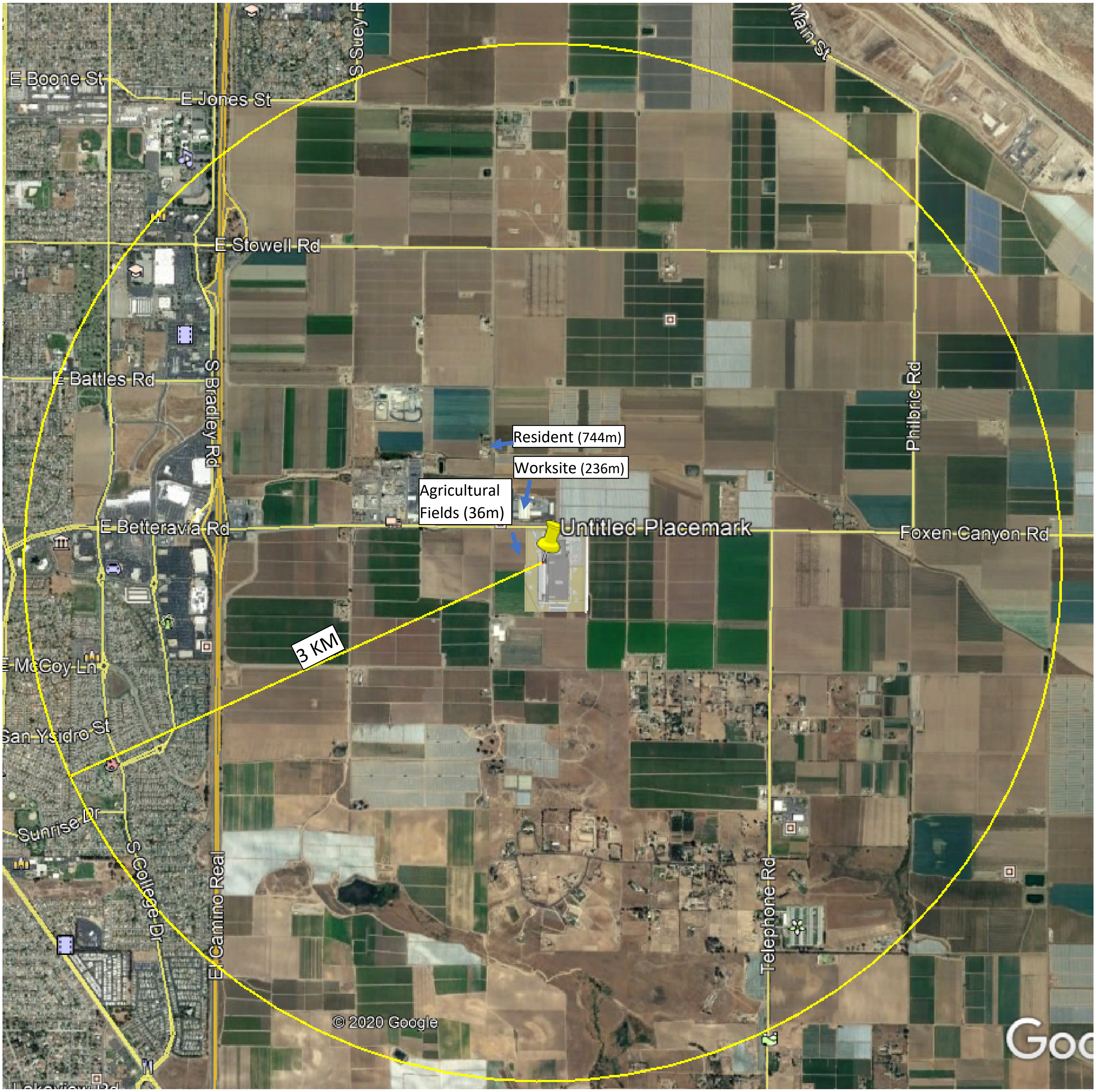

E Boone St
E Jones St
S Suey Rd
Main St
E Stowell Rd
E Battles Rd
S Bradley Rd
Philbric Rd
Resident (744m)
Worksite (236m)
Agricultural
Fields (36m)
E Betteravia Rd
Untitled Placemark
Foxen Canyon Rd
3 KM
E McCoy Ln
San Ysidro St
Sunrise Dr
S College Dr
El Camino Real
Telephone Rd
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LSA

ATTACHMENT H

MANUFACTURER SPECIFICATION SHEETS FOR THE FIRE PUMP AND BOILERS

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MIURA

Specification: LX-100-12

ITEM	UNITS	Standard	Ultra Low NOx

Boiler Output

ITEM	UNITS	Standard / Ultra Low NOx
Boiler Type	-	Multiple water tube, once through, forced flow, steam boiler
Maximum Allowable Working Pressure	PSIG	170
Recommended Operational Range	PSIG	70 - 150
Boiler Heating Surface Area	ft^2	269
Boiler Horsepower Rating	BHP	100
Equivalent Output[i]	lb/hr	3,450
Maximum Heat Output	MMBTU/hr	3.348
Turn-Down	-	3:1 (33%)

Trim Selection

ITEM	UNITS	Standard	Ultra Low NOx
Integral Economizer (S)	Yes / No	Yes	Yes
Fuel Selection (G)	Gas	Gas	Gas
Low NOx Option (N)	Yes / No / NA	No	Yes
Boiler Trim	-	LX-100 SG	LX-100 SGN

Air and Fuel Requirements

ITEM	UNITS	Standard	Ultra Low NOx
Fuel Supply Pressure	PSIG	3-5 PSIG (Natural Gas or Propane)	
Heat Input	MMBTU/hr	3.939	3.939
Efficiency[ii]	%	85%	85%
Flue Gas Excess Oxygen	%	5.0%	7.0%
Flue Gas Temperature[ii]	°F	260	240
NG/LPG Fuel Consumption[iii]	SCFH / GPH	3,860 / 43	3,860 / 43
Required Air Volume	SCFH	48,730	55,740
Flue Gas Volume - Wet	SCFH	52,590	59,600
Flue Gas Volume - Dry[iv]	SCFH	45,100	51,590
Flue Gas Velocity	ft/s	26.7	29.4

Emissions

ITEM	UNITS	Standard	Ultra Low NOx
NOx Emission NG/LPG[v]	ppm (lbs/MMBTU)	20/25 (0.0243 / 0.0304)	9/12 (0.0110 / 0.0146)
CO Emission NG&LPG[v]	ppm (lbs/MMBTU)	100 (0.0739)	50 (0.0370)
CO_2 Emission NG/LPG[v]	lbs/MMBTU	117.6 / 136.6	
VOC Emission NG&LPG[v]	lbs/MMBTU	0.00539	
SO_2 Emission NG/LPG[vi]	lbs/MMBTU	0.00588 / 0.00547	
PM Emission NG&LPG[v]	lbs/MMBTU	0.00745	

Weights & Capacities

ITEM	UNITS	Standard	Ultra Low NOx
Shipping Weight	lbs	6,000	6,000
Operational Weight	lbs	6,600	6,600
Operational Water Content	Gal	60	60
Fully Flooded Water Content	Gal	135	135

Inlet & Outlet Connections

Economizer Drain (If Equipped)	in	2" npt
Main Steam Outlet	in	2" npt
Safety Valve[vii]	in	2" npt
Drip Pan Elbow Vent	in	3"
Drip Pan Elbow Drain	in	3/4" npt
Feedwater Inlet	in	1" npt
Fuel Gas Inlet	in	2" npt
Automatic "Surface" Blowdown	in	3/8" npt
Bottom Blow-Off	in	1" npt
LVC Blow-Off	in	1" npt
Chimney Diameter	in	12" OD

Electrical Components & Controls

Power Supply	-	575, 460, 380, 230 or 208 Volts, 3 Phase, 60 Hz
Max. Electrical Consumption[viii]	kVA	12.6 or 15.5
Blower Motor	HP	10
Water Pump Motor[viii]	HP	3 or 5
Control Power Transformer	kVA	0.5
Combustion Control	-	3 Position Step Burner (High - Low - Off)
Combustion System	-	Forced Draft Burner
Ignition System	-	Electric Spark Ignited, Interrupted Gas Pilot
Flame Safeguard	-	Miura BL Microcontroller with Miura ZUV Flame Sensor
Low Water Protection	-	Primary and Secondary Low Water Cutoff Electrodes
Miura Online Maintenance (M.O.M)	-	Analog Phone Line

NOTES:

i) Equivalent Output is calculated based on conversion of 212°F feedwater to 212°F steam.

ii) Flue gas temperatures and efficiencies are based on 68°F feedwater and 80°F combustion air and calculated using the higher heating value

iii) Fuel consumption for NG and LPG is based on a higher heating value of 1,020 Btu/SCF and 91,500 Btu/Gal respectively

iv) Dry flue gas volume is based on F-Factor of 8710 SCF/MMbtu and corrected for the operating O2 percentage

v) NOx and CO emissions are based on empirical test data corrected to 3% excess oxygen, all others are calculated using EPA factors.

vi) SO2 factor assumes 0.2 grains per scf for NG and 0.5 grains per scf for LPG

vii) Boiler Safety Valve Outlet size may increase if set pressure is below 170 PSIG

viii) Water pump output may vary by feedwater piping options

Specification: **LX-300-16**

ITEM	UNITS	Standard	Ultra Low NOx
Boiler Output			
Boiler Type	-	Multiple water tube, once through, forced flow, steam boiler	
Maximum Allowable Working Pressure	PSIG	170	
Recommended Operational Range	PSIG	70 - 150	
Boiler Heating Surface Area	ft^2	611	
Boiler Horsepower Rating	BHP	300	
Equivalent Output[i]	lb/hr	10,350	
Maximum Heat Output	MMBTU/hr	10.043	
Turn-Down	-	4:1 (25%)	4:1 (25%)
Trim Selection			
Integral Economizer (S)	Yes / No	Yes	Yes
Fuel Selection (G)	Gas	Gas	Gas
Low NOx Option (N)	Yes / No / NA	No	Yes
Boiler Trim	-	LX-300 SG	LX-300 SGN
Air and Fuel Requirements			
Fuel Supply Pressure	PSIG	3-5 PSIG (Natural Gas or Propane)	
Heat Input	MMBTU/hr	11.544	11.544
Efficiency[ii]	%	87%	87%
Flue Gas Excess Oxygen	%	5.0%	6.5%
Flue Gas Temperature[ii]	°F	190	180
NG/LPG Fuel Consumption[iii]	SCFH / GPH	11,320 / 126.2	11,320 / 126.2
Required Air Volume	SCFH	142,820	157,690
Flue Gas Volume - Wet	SCFH	154,140	169,010
Flue Gas Volume - Dry[iv]	SCFH	132,170	145,930
Flue Gas Velocity	ft/s	25.1	27.1
Emissions			
NOx Emission NG/LPG[v]	ppm (lbs/MMBTU)	20/25 (0.0243 / 0.0304)	9/12 (0.011 / 0.0146)
CO Emission NG&LPG[v]	ppm (lbs/MMBTU)	100 (0.0739)	50 (0.0370)
CO_2 Emission NG/LPG[v]	lbs/MMBTU	117.6 / 136.6	
VOC Emission NG&LPG[v]	lbs/MMBTU	0.00539	
SO_2 Emission NG/LPG[vi]	lbs/MMBTU	0.00588 / 0.00547	
PM Emission NG&LPG[v]	lbs/MMBTU	0.00745	
Weights & Capacities			
Shipping Weight	lbs	11,500	11,500
Operational Weight	lbs	12,600	12,600
Operational Water Content	Gal	130	130
Fully Flooded Water Content	Gal	300	300

Inlet & Outlet Connections

Economizer Drain (If Equipped)	in	2" npt
Main Steam Outlet	in	4" flg 150#
Safety Valve[vii]	in	2-1/2" npt (Qty 2)
Drip Pan Elbow Vent	in	4" (Qty 2)
Drip Pan Elbow Drain	in	3/4" npt (Qty 2)
Feedwater Inlet	in	1-1/2" npt
Fuel Gas Inlet	in	2-1/2" npt
Automatic "Surface" Blowdown	in	Tees into Bottom Blow-Off Piping
Bottom Blow-Off	in	1-1/4" npt
LVC Blow-Off	in	Tees into Bottom Blow-Off Piping
Chimney Diameter	in	20" OD

Electrical Components & Controls

Power Supply	-	575, 460, 380, 230 or 208 Volts, 3 Phase, 60 Hz	
Max. Electrical Consumption[viii]	kVA	32.9	37.3
Blower Motor	HP	25	30
Water Pump Motor[viii]	HP	10	
Control Power Transformer	kVA	0.5	
Combustion Control	-	4 Position Step Burner (High - Low - Ignition - Off)	
Combustion System	-	Forced Draft Burner	
Ignition System	-	Electric Spark Ignited, Interrupted Gas Pilot	
Flame Safeguard	-	Miura BL Microcontroller with Miura ZUV Flame Sensor	
Low Water Protection	-	Primary and Secondary Low Water Cutoff Electrodes	
Miura Online Maintenance (M.O.M)	-	Analog Phone Line	

NOTES:

i) Equivalent Output is calculated based on conversion of 212°F feedwater to 212°F steam.

ii) Flue gas temperatures and efficiencies are based on 68°F feedwater and 80°F combustion air and calculated using the higher heating value

iii) Fuel consumption for NG and LPG is based on a higher heating value of 1,020 Btu/SCF and 91,500 Btu/Gal respectively

iv) Dry flue gas volume is based on F-Factor of 8710 SCF/MMbtu and corrected for the operating O2 percentage

v) NOx and CO emissions are based on empirical test data corrected to 3% excess oxygen, all others are calculated using EPA factors.

vi) SO2 factor assumes 0.2 grains per scf for NG and 0.5 grains per scf for LPG

vii) Boiler Safety Valve Outlet size may increase if set pressure is below 170 PSIG

viii) Water pump output may vary by feedwater piping options

LX Series

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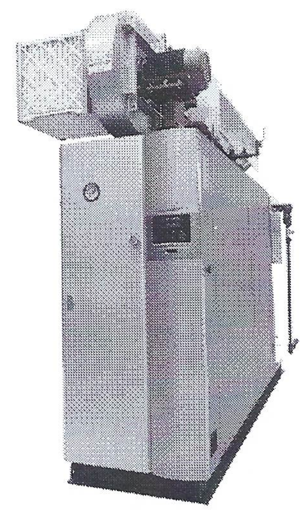
LX-50, LX-100, LX-150, LX-200

LX Gas/ Low NOx Series

Low and High Pressure Steam Boiler



Miura's Ultra Low NOx Steam Generator uses the most advanced technology. The flat shaped burner and the rectangular shaped boiler vessel are uniquely designed for the reliable low NOx.

- 5 minutes from cold start to full pressure.
- Ultra Low NOx gas burner with "Quenched flame".
- Up to 300HP per boiler and up to 4,500HP (150,000lb/hr) with our MI-system.
- 170 PSIG and 15 PSIG MAWP available.

Miura's exclusive "low water content, water tube" design is the most versatile boiler available in the marketplace today. A once-through, forced circulation steam boiler producing steam in just 5 minutes while maintains an 85% fuel-to-steam efficiency.

LX-300

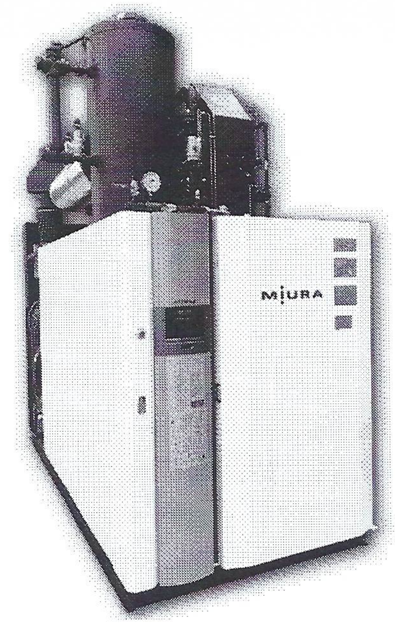
NEW The New LX-300 Zero-Side-Clearance Steam Boiler Packs All the Horsepower You Need in 1/4 the Space

Small footprint design offers high-efficiency, On-Demand Steam Saving money, space, and start-up time.

- Modular design allows flexibility to customize your steam plant to meet any demand and load profile optimized for superior energy management
- Zero-side-clearance design reduces boiler room size and cuts construction costs

- Achieves **87%** efficiency using Miura's built-in energy recovery & water treatment systems
- Steam production from **cold start in 5 minutes**
- Saves up to 20% on fuel costs & CO_2 emissions on average.
- New design innovations optimize combustion for consistent low NOx emissions.
- **Ultra Low NOx Model Now Available (9 ppm)**

MIURA's exclusive "low water content, water tube" design is the most versatile boiler available in the marketplace today. A once-through, forced circulation steam boiler producing steam in just 5 minutes while maintains an 87% fuel-to-steam efficiency.



LX Series Comparison Table

ITEM	LX(L)-50 SG	LX(L)-100 SG	LX(L)-150 SG	LX(L)-200 SG	NEW LX-300 SG[7]
Utilization Horsepower[1] (BHP)	50	100	150	200	300
Maximum Pressure (PSIG (MPa))	170 PSIG MAWP, 150 PSIG Maximum Operating (15 PSIG MAWP)				
Equivalent Output[2] (LB/HR)	1,725	3,450	5,175	6,900	10,350
Heat Output (BTU/HR)	1,674,000	3,348,000	5,022,000	6,695,000	10,050,000
Efficiency (Fuel to steam)[3]	85%				87%
Operational Weight (LBS)	3,710	6,070	8,620	8,620	12,600
Shipping Weight (LBS)	3,480	5,470	7,820	7,820	11,500
Dimensions Given are Approximate					
Width (in.)	37" (50")	37" (67")	55"	55" (75")	63"
Length (in.)	94" (119")	123" (155")	140"	140"	158"
Height (in.)	98" (147")	111" (161")	126"	126" (131")	127"
Combustion System	Proprietary Forced Draft, Step Fired Hi-Low-Off				
Ignition System	Electric Spark Ignited, Interrupted Gas Pilot				
Power Supply	208, 230, 460, 575V, 3 phase, 60Hz				

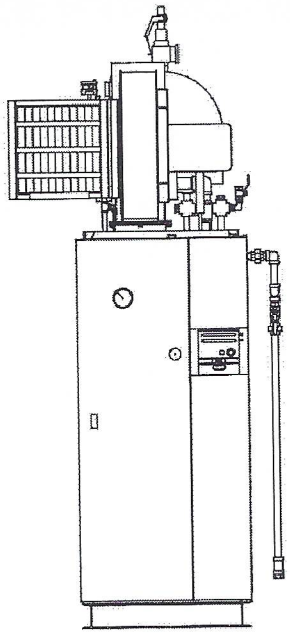
Max. Electrical Consumption (KVA)	6.5 (5.0)	13.3 (10.9)	22.1	24.3	refer to insatallation manual 1.8
Fuel Type[4]	Natural Gas or Propane Gas (3-5 PSIG)				
Natural Gas Consumption[5] (SCFH)	1,970	3,940	5,910	7,880	11,540
Gas Suppy Pressure	3-5 PSIG (Natural Gas or Propane Gas)				
Main Steam Outlet (in.)	2" (4")	2" (6")	3" (8")	3" (8")	4"
Safety Valve Outlet[6] (in.)	One 1 ¼" (2 ½")	One 2" (Two 2 ½")	One 2 ½" (Two 4")		Two 2 ½"
Main Water Inlet (in.)	¾"	1"			1 1/2"
Fuel Gas Inlet (in.)	1 ½"	2"			2 ½"
Automatic Surface Blowdown	One ⅜"				Note 9
Bottom Blow-off & L.V.C Blow-off	Two 1"				Note 9
Chimney Diameter (OD)	12"		20"		
Flame Detector	Self-Checking Ultraviolet Flame Eye Sensor				
Pressure Control	Adjustable Pressure Transducer and Switches				
Liquid Volume Control	Electric Conductivity Type				
Overheat Protection	Low Water Cut Off & Thermocouple				

"S" - Economizer
"G" - Natural Gas or Propane Fired
"(L)" - Low Pressure

Dimensions and Schematic

Dimensions

The drawing illustrated is LX-200 SGI-07

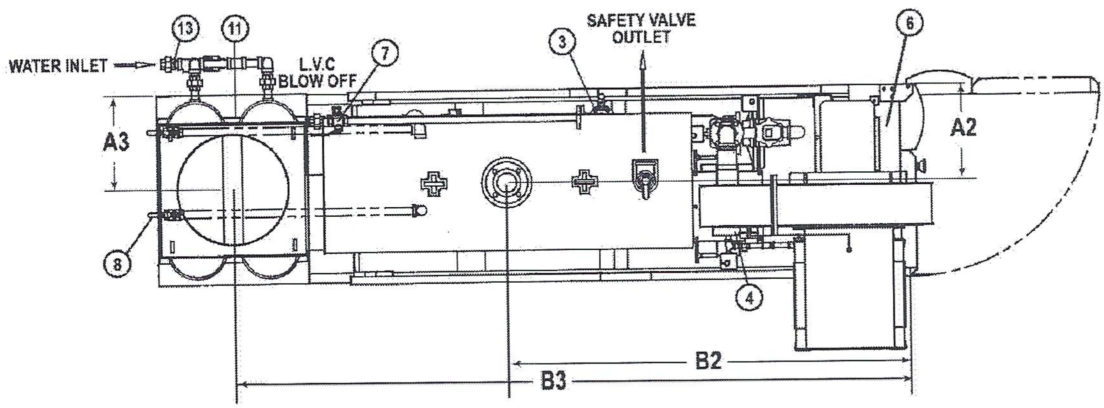


FRONT VIEW

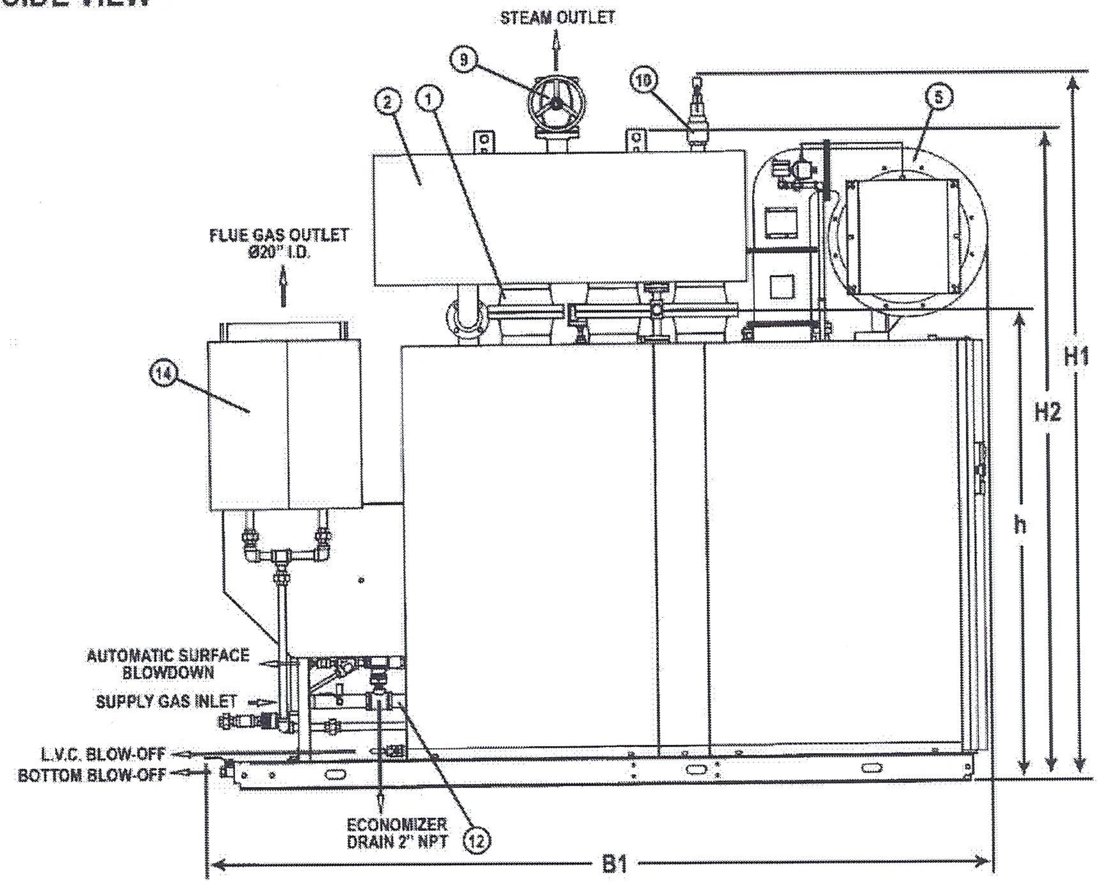
(inches)

	FOOTPRINT				
	A1[1]	B1[1]	H1[1]	H2[2]	h[3]
LX-50 SG	37	94	98	96	79
LX-100 SG	37	123	111	97	79
LX-150 SG	55	140	123	117	84
LX-200 SG	55	140	126	117	84
LX 300 SG	63	158	127	-	-

TOP VIEW



SIDE VIEW

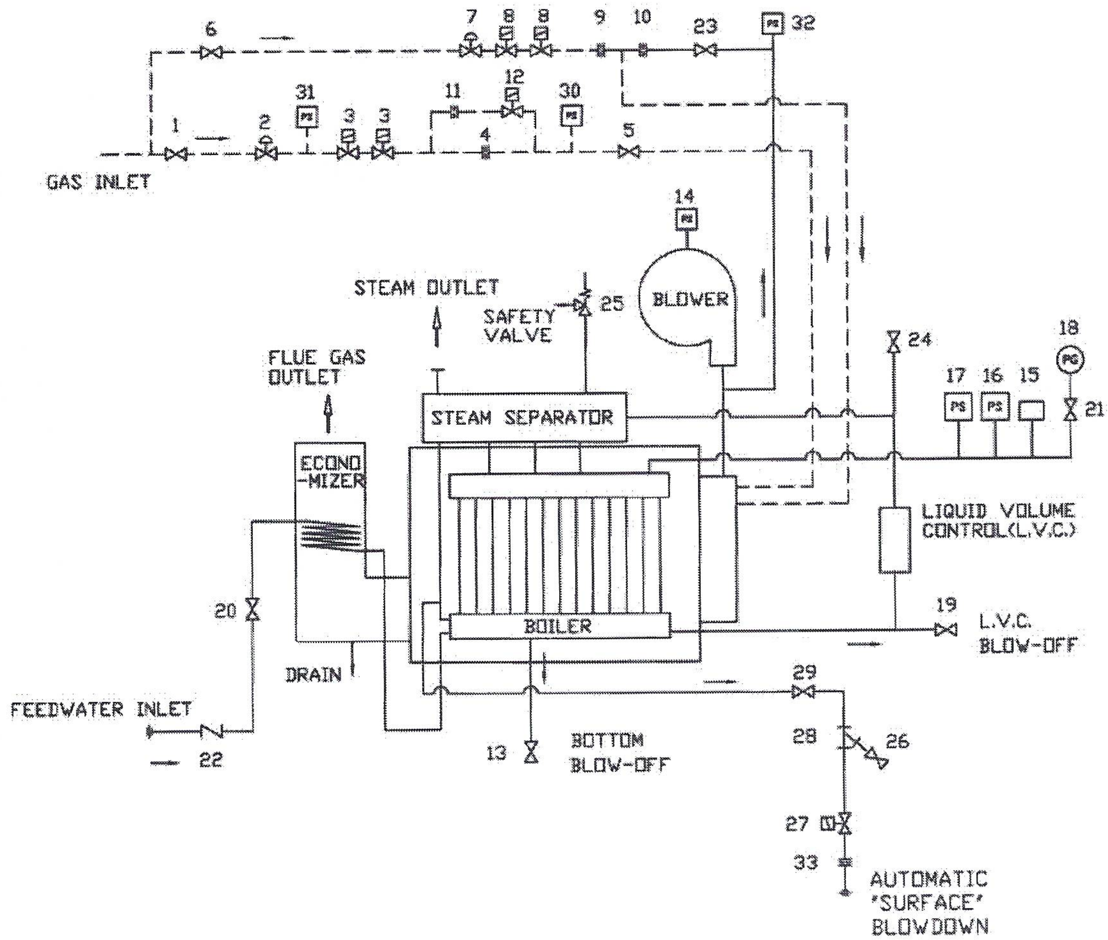


NO.	NAME OF PART	NO.	NAME OF PART
1	BOILER VESSEL	8	BOTTOM BLOW OFF VALVE
2	STEAM SEPARATOR	9	STEAM OUTLET VALVE (OPTION)
3	LIQUID VOLUME CONTROLLER	10	MAIN SAFETY VALVE
4	WIND BOX	11	AUTOMATIC SURFACE BLOWDOWN
5	BLOWER	12	MAIN GAS TRAIN
6	CONTROL BOX	13	FEEDWATER PIPING
7	L.V.C. BLOW-OFF VALVE	14	ECONOMIZER

NOTE :

1. Dimensions, Specifications and some pipings are subject to change without notice.
2. Minimum Height with separator & blower assy dismantled.
3. Minimum clearance in front of control box and inverter box are dictated by installation codes.

SCHEMATIC VIEW (Standard)



NO.	NAME OF PART	NO.	NAME OF PART
1	MAIN GAS VALVE	18	PRESSURE GAUGE
2	MAIN GAS REGULATOR	19	L.V.C BLOW-OFF VALVE
3	GAS CONTROL VALVE	20	VALVE
4	MAIN GAS ORIFICE (LOW)	21	PRESSURE GAUGE VALVE
5	TEST FIRING VALVE	22	CHECK VALVE
6	PILOT GAS VALVE	23	AIR CONTROL VALVE
7	PILOT GAS REGULATOR	24	AIR VENT VALVE
8	PILOT GAS CONTROL VALVE	25	SAFETY VALVE
9	PILOT GAS ORIFICE	26	SAMPLE WATER VALVE
10	PILOT AIR ORIFICE	27	SURFACE BLOWDOWN VALVE
11	MAIN GAS ORIFICE (HIGH)	28	BLOWDOWN STRAINER
12	HIGH-LOW CONTROL VALVE	29	BLOWDOWN VALVE
13	BOTTOM BLOW-OFF VALVE	30	GAS PRESSURE SWITCH
14	PRESSURE SWITCH	31	GAS PRESSURE SWITCH
15	PRESSURE SWITCH	32	AIR PRESSURE SWITCH
16	STEAM PRESSURE SWITCH	33	BLOWDOWN ORIFICE
17	STEAM PRESSURE SWITCH		

NOTE :

[1] A1, B1, and H1 are overall max widgth, length, and height respectively

[2] Minimun height with Safety Valve and Blower Assembly dismantled.

[3] Minimum height with Steam Separator, Blower Assembly and LVC Assembly dismantled.

* Specification and Dimensions are approximate. We reserve the right to change dimensions without notice. Operating Specification may change based on field conditions.

Notes

NOTES:

[1] Available 49 and 180 BHP rating for L.A. area.

[2] Equivalent output calculated base on conversion of 212°F (100°C) feedwater to 212°F (100°C) steam.

[3] Thermal Efficiencies are based on high heating values of fuels and 68°F(20°C) feedwater.

[4] c-UL-us approved for Natural gas and propane gas.

[5] Gas consumption based on Natural Gas with high heating value 1,000 Btu/SCF and

calculated with economizer.

[6] Safety valve outlet size may change depending on the pressure setting.

[7] See Miura's MI system brochure for more on how the new LX-300 zero-side-clearance layout offers the highest system capacity per square foot in the industry.

[8] High pressure model (300 PSI), LXH200, LXH300 is available.

[9] Tees into Bottom Blow-off piping (1 ¼").

ADDITIONAL NOTES:

1 All Miura Steam boilers are fully packaged and test fired at factory.

2 Built to meet or exceed UL & ASME standards, CSA & B-51 standards.

3 Low pressure steam is available in 50, 100, and 200 BHP only.

4 California Low NOx models (LX 100SGI, LX 200SGI, and LX 300 SGI) available.

5 Both Operational and Shipping weights may vary for LX(L) - models.

i. The low pressure steam is available in 50, 100 and 200HP only.

/

MIURA

7/23/2019

Natural Gas Burning Emissions for Boiler Model LX(L)-100 SG

Miura certifies that the LX(L)-100 SG boiler model will achieve the emission levels as shown below for NOx, CO, CO2, VOC, SO2 and PM. The emission levels shown are based upon the boiler being installed correctly, properly maintained, and operated under normal loading conditions within the designed parameters. The boiler may need to be adjusted at the initial start-up by a Miura certified technician. After the initial setup, it is the responsibility of the owner to test the boiler regularly to insure the boiler is tuned and operating correctly.

Special low NOx burner and controls are engineered and manufactured by Miura

<u>NOx:</u>

Measured	20 ppm (natural gas)
Dry flue gas volume	40000 scfh
Molecular mass	46.1
Constant	2.595E-09
Calculation	(40000 scfh) x (20 ppm) x (46.1) x (2.595E-9) = 0.096 lbs/hr

<u>CO:</u>

Measured	100 ppm (natural gas)
Dry flue gas volume	40000 scfh
Molecular mass	28
Constant	2.595E-09
Calculation	(40000 scfh) x (100 ppm) x (28) x (2.595E-9) = 0.291 lbs/hr

<u>CO2:</u>

Fuel Input	3.938 MMBtu/hr
High Heating Value	1020 Btu/scf
EPA Emission Factor	120,000 lbs/MMscf (natural gas)
Calculation	(3.938 MMBtu/hr) / (1020 Btu/scf) x (120,000 lbs/MMscf) = 463 lbs/hr

<u>VOC:</u>

Fuel Input	3.938 MMBtu/hr
High Heating Value	1020 Btu/scf
EPA Emission Factor	5.5 lbs/MMscf (natural gas)
Calculation	(3.938 MMBtu/hr) / (1020 Btu/scf) x (5.5 lbs/MMscf) = 0.021 lbs/hr

<u>SO2:</u>

Fuel Input	3.938 MMBtu/hr
High Heating Value	1020 Btu/scf
EPA Emission Factor	0.6 lbs/MMscf (natural gas)
Calculation	(3.938 MMBtu/hr) / (1020 Btu/scf) x (0.6 lbs/MMscf) = 0.0023 lbs/hr

MIURA

PM:

Fuel Input	3.938	MMBtu/hr
High Heating Value	1020	Btu/scf
EPA Emission Factor	7.6	lbs/MMscf (natural gas)
Calculation	(3.938 MMBtu/hr) / (1020 Btu/scf) x (7.6 lbs/MMscf) = 0.029 lbs/hr	

The NOx and CO are corrected to 3% O2 based on natural gas combustion
The dry flue gas volume was corrected to 3% O2 at 68 degrees F

Reference: AP-42, Table 1.4-2 Emissions Factors, U.S Environment Protection Agency

The table below shows the emissions based on operating one LX(L)-100 SG at 100% load for 24 hours a day, 91 days per quarter, and 365 days per year.

Emission Data	lbs/hr	lbs/qtr	tons/year	lbs/MMBtu
NOx	0.096	209	0.420	0.0243
CO	0.291	636	1.275	0.0739
CO2	463	1,020,000	2029	118
VOC	0.021	46.4	0.093	0.0054
SO2	0.002	5.06	0.010	0.0006
PM	0.029	64.1	0.129	0.0075

Capitol Pump Resources

5891 Mullen Road SE • Lacey, WA 98503
(360) 493-1830
Fax: (360) 923-1841
Email: hcaulfield@capitolpump.com

Project: Artic Cold

Contractor: J.F. Ahern Co.
Fond du Lac, WI

Submittal
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8AEF17Q– 2500 GPM @ 130 PSI – 351 Hp/2100 RPM

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12-13	Pump Construction Drawing and Material
14-16	Dimensional Data
17	RH Fire Pump Rotation (Clockwise)
18	Pump Accessories Layout of Fire Pump Fittings
19	Jockey Pump Accessories
20	Automatic Air Release Valve Data
21	Fire Pump Fittings
22-23	Pilot Operated Main Relief Valve Data
24-25	10"x300# Grooved Test Header
26-39	Clarke JW6H-UFADD0-D Fire Pump Engine
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48-59	Eaton FD120 Diesel Fire Pump Controller Data
60-62	Grundfos CR 5-12 Jockey Pump
63-68	Eaton XTJP Jockey Pump Controller

Submitted by ***Capitol Pump Resources***

Capitol Pump Resources

5891 Mullen Rd SE Lacey WA 98503
Hugh Caulfield
Phone 360-493-1830
Fax 360-923-1841

Customer : **J.F. Ahern Co.**
201 Morris Court
Fond du Lac, WI
54935

Contact : **Glenn Warga**
Phone : **920-913-6008** Fax :
Date : **Thursday, April 02, 2020**

Project : **Artic Cold**
Quote No. : **2047796**

Item: **1**

Model : **Peerless - 8AEF17Q**

Flow (US gpm)	Head (psi)	Eff. (%)	Power (hp)	Speed (RPM)
2500	**130**	**76.3**	**248.5**	**2100**
Liquid	Temp. (°F)	Sp. Gravity	Visc. (cSt)	Dia. (inch)
Water	**68**	**1.000**	**1.007**	**14.85**

Summary Quotation:

Item No	Description	Weight (lb)	Qty
1	**8AEF17Q - Br Fitted, Pkd UL-FM Listed**	1010	1
2	**CI Casing with 125lb Suct/250lb Disch FF ANSI flanges**	0	1
3	**Hardware & Split Flange Gasket for 125lb/250lb ANSI Csg**	0	1
4	**Brass Impeller with Integral Rings**	0	1
5	**Br Casing Rings**	0	2
6	**Standard Grease Lube Bearings**	0	1
7	**RH Steel Shaft Single Row Outboard Bearing**	0	1
8	**Single Row Outboard/Inboard Brgs with Std Lip Seals**	0	1
9	**304 SS Shaft Sleeves (set of 2)**	0	1
10	**Standard Packing Suction Pressure < 100 Psi**	0	1
11	**UL-FM Lantern Ring with Seal Piping Std or High Pressure Pkg**	0	1
12	**UL Listed/FM Approved Fire Pump Nameplate US**	0	1
13	**US H I Std NW Perf Test Included in Pump Price**	0	1
14	**US H I Non-Witness Hydrostatic Test Included in Pump Price**	0	1
15	**Pump Mtg Parts without Base Mounted Controller, Risers & Hardware Only, Factory**	0	1
16	**JW6H-UFADD0-D 351Hp/2100Rpm 230V-50/60Hz Htr NSPS Tier 3 w/PLD, Diesel Engine UL/FM/ULC 12V NG, Clarke CW Rotation Only**	2859	1
17	**Non Drip Rim Base**	0	0
18	**Standard engine cooling water loop is suitable for water temperature up 100 Degrees F. (37.78 C.). If exceeded refer to Clarke Fire website for cooling water piping size calculator to see if optional larger cooling loop is required**	0	0
19	**Minimum Inlet Pressure is 80 Psig @ 150% of Pump Rated flow, Pressure Regulator set at 60 psig and 10 psig discharge pressure. If less than minimum required inlet pressure, refer to Clarke Fire (www.clarkefire.com) for Cooling Loop Online Calculator.**	0	0

Quote valid for 30 days

PEERLESS PUMP®

Capitol Pump Resources

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Hugh Caulfield
Phone 360-493-1830
Fax 360-923-1841

Customer : **J.F. Ahern Co.**
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Fond du Lac, WI
54935

Contact : **Glenn Warga**
Phone : **920-913-6008** Fax :
Date : **Thursday, April 02, 2020**

Project : **Artic Cold**
Quote No. : **2047796**

20	Standard 1 1/4" HSC/ES FM Engine Cooling Loop Galv Stl Piping Included in Engine Price	0	1
21	Combination Flex Shaft FlyWheel Cover Guard, Fuel Lines, Flexible Exhaust Connector (Included in Engine price)	0	0
22	Lead Acid Batteries (Dry)	0	0
23	Battery Acid by Others All Shipments (15 liters (4D), 17 Liters (8D) per Battery (1.265 sp gr required))	0	0
24	Pressure Limiting Driver (PLD) ELECTRONIC PLD 100 350 PsigWorking Range. Pressure Set Point AND CLARKE LOG# MUST be Specified.	0	0
25	UL Listed Flexible Drive Shaft and Guard Furnished 2100 Rpm Only	0	0
26	FD120 12 VDC Neg Ground, Fire Pump Diesel Controller, Eaton	105	1
27	NEMA Type 2 Enclosure Standard	0	1
28	For 12 Volt Lead Acid Batteries	0	0
29	Pressure transducer 0 600 psi (.7 21.2 kg/cm2) for fresh water service	0	1
30	Low fuel level switch 16 Inches max insertion length Specify Tank Dia & Gallon Capacity (shipped loose)	0	1
31	Print to file all events from memory to USB port onto a flash drive or view/download events to personal computer via ethernet cable.	0	1
32	110 240 Volt 50/60 Hz Supply Voltage	0	1
33	Nameplate Labeling English	0	1
34	6x10 125 Lb ANSI Flg CI, Enclosed Over Flow Cone, Factory	136	1
35	2.5NPT Natl Std, Angle Hose Valves w/Caps&Chns, Factory	112	8
36	1/2 600 psi Max, Hose Valve Head Drain Valve, Factory	2	1
37	460 Gal E,1/8,1/4,3/8,1/2,5/8,3/4,7/8,Full Scale, Tank Direct Reading Fuel Gauge, Factory Choice	5	1
38	For Double Wall Fuel Tanks, Leak Sensing Float Switch, Flotronix FLO L10785	5	1
39	UL Listed Diesel Fuel System 4 In. Weatherhood Free Vent 1/2 In. Fittg. Dbl. Wll Tank, Factory	10	1
40	15 300Psi Suct 0 600Psi Disc, Suc&DisGagew/oGageProtLiqFilled, Factory	6	1
41	1/2 In, 300 Psi Max UL FM , Automatic Air Release Valve, Factory Choice	9	1
42	10" x 300# Grooved Inlet D.I., Test Head, CLA-VAL TH	150	1
43	6 in 100 300 Psi Range UL/FM, Pilot Oper Rel Val 300x150 Lb, Cla Val 2050B 4KG	295	1
44	CR 5 12 5Hp 182TC Fr 3Ph 208 230/460V, Jockey Pump w/TEFC Motor, Grundfos	111	1
45	Cast Iron Base w/ 1 1/4 inch Oval Suction/Discharge Flange	0	0

Quote valid for 30 days

Capitol Pump Resources

5891 Mullen Rd SE Lacey WA 98503
Hugh Caulfield
Phone 360-493-1830
Fax 360-923-1841

Customer : **J.F. Ahern Co.**
201 Morris Court
Fond du Lac, WI
54935

Contact : **Glenn Warga**
Phone : **920-913-6008** Fax :

Project : **Artic Cold**
Quote No. : **2047796**

Date : **Thursday, April 02, 2020**

46	Casing Rel Val Kunkle 3/4 Inch 176 250 psiG FM (12.13 17.24 bar)	4	1
47	5Hp/460V/3Ph/60Hz 100000AIC, Jockey Pump Controller, Eaton	20	1
48	NEMA Type 2 (IEC IP11) Enclosure Standard	0	1
49	C06534 6.0x12.0x56 EI EO, Residential Muffler	98	1
50	UL 142 460 Gal DBL Wall Steel, NFPA Diesel Fuel Tank with Legs, Factory Choice	1100	1

Only items listed above to be supplied. All other items needed to be supplied by others.

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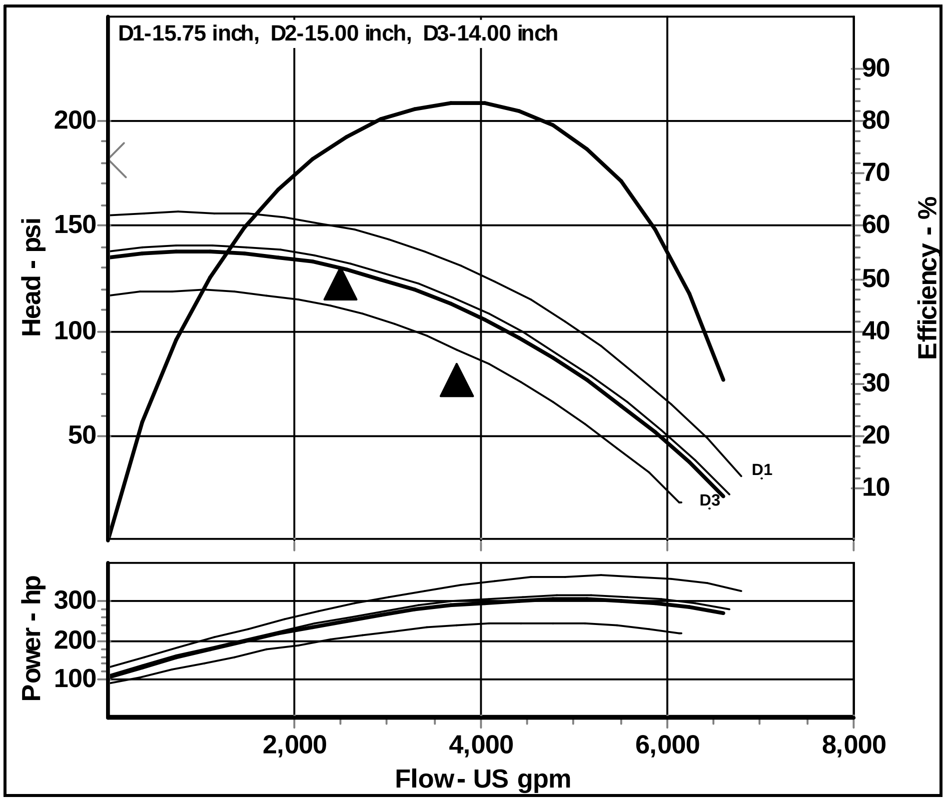
Customer :	J.F. Ahern Co. 201 Morris Court Fond du Lac, WI 54935		
Contact :	Glenn Warga		
Project :	Artic Cold	Phone :	920-913-6008 Fax :
Quote No. :	2047796 Page No : 4	Date :	Thursday, April 02, 2020

Type:	AEF - Horizontal Split Case Single Stage Fire	**Item :**	1
Pump Model:	Peerless - 8A EF17Q	**Impeller No.:**	**2693257**
Nom. Speed:	2100 RPM, Diesel	**Fluid:**	Water
Impeller Dia.:	14.85 **inch**	**Temperature:**	68 **°F**
Curve No.:	3136097r/18-Ju	**Viscosity:**	1.007 **cSt**
Market :	FM/UL/ULC Listed Fire Pump	**Sp. Gravity:**	1.000
		Your Ref. :	



Rated Flow	2500 **US gpm**
Rated Head	130 **psi**
Imp. Dia.	14.85 **inch**
Rated Power Required	248.5 **hp**
Rated Efficiency	76.3 **%**

NFPA Limits:

140% Head at shutoff	182 **psi**
65% Head at 150% flow	84.5 **psi**
Flow at 150%	3750 **US gpm**
Head at 150%	111.3 **psi**
Power Req. at 150%	291.4 **hp**
Efficiency at 150%	83.6 **%**
Peak Power	306 **hp**
Closed Valve Head	134.9 **psi**
Approval/Listing	FM/UL

Comments

Performance curve represents typical performance. NPSH data is

Flow (US gpm)	Head (psi)	Efficiency (%)	Power Required (hp)	NPSH Required (ft)
0.0	**134.9**	**0.0**	**106.4**	
825.3	**137.7**	**41.7**	**159.0**	
1650.5	**136.3**	**63.5**	**206.8**	
2475.8	**130.2**	**76.1**	**247.4**	
3301.0	**119.3**	**82.4**	**278.9**	
4126.3	**103.3**	**83.2**	**299.1**	
4951.5	**81.8**	**77.3**	**306.0**	
5776.8	**54.7**	**62.0**	**297.3**	
6602.1	**21.5**	**30.6**	**271.1**	

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Customer : J.F. Ahern Co.
201 Morris Court
Fond du Lac, WI
54935

Contact : Glenn Warga
Phone : 920-913-6008 Fax :
Date : Thursday, April 02, 2020

Project : Artic Cold
Quote No. : 2047796

Item: 1
Model : Peerless - 8AEF17Q

Flow (US gpm)	Head (psi)	Eff. (%)	Power (hp)	Speed (RPM)
2500	**130**	**76.3**	**248.5**	**2100**
Liquid	Temp. (°F)	Sp. Gravity	Visc. (cSt)	Dia. (inch)
Water	**68**	**1.000**	**1.007**	**14.85**

Technical Information:

Technical Information: 8AEF17Q

Casing Suction Design	Double
Casing Volute Design	Double
Nominal Casing Thickness Inches	0.62
Corrosion Allow Inches	0.12
Max Suct Press PSI Packed 125# Suct CI Csg	150
Max Suct Press PSI Packed 250# Suct CI Csg	150
Max Suct Press PSI Packed 250# Suct DI Csg	150
Max Work Press PSI Packed 125# Disch CI Csg	175
Max Work Press PSI Packed 250# Disch CI Csg	262
Max Work Press PSI Packed 250# Disch DI Csg	Not Available
Cutwater Diameter Inches	18.9
Number of Impeller Vanes	8
Minimum Impeller Diameter Inches	14
WR2 Lb-Ft2 Wet Bronze Impeller	11.8
Shaft Diameter Through Impeller Inches	2.125
Shaft Dia Through Coupling Inches	1.875
Stuffing Box Shaft Sleeve Diameter Inches	2.375
Stuffing Box Bore Inches	3.5
Stuffing Box Depth Inches	3.75
Stuffing Box Face Nearest Obstruction Along Shaft In	2.19
Stuffing Box Square Packing Inches	0.5625
Stuffing Box Packing Rows without Lantern Ring	6
Stuffing Box Packing Rows with Lantern Ring	5
Stuffing Box Gland Bolt Circle	6.25

Stuffing Box Gland Bolt Dia Inches	0.625
Thrust Single Row Bearing Size	308
Radial Single Row Bearing Size	210
Thrust Double Row Bearing Size Optional	5308
First Critical Speed RPM	3649
Max Pump RPM Standard Construction	2100
Priming Connection NPT	1
Discharge Drain NPT	1
Suction Drain NPT	0.5
Rotor Series	4
Equivalent Commercial Model	8AE17Q

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Contact : **Glenn Warga**
Phone : **920-913-6008** Fax :
Date : **Thursday, April 02, 2020**

Project : **Artic Cold**
Quote No. : **2047796**

Item: **1**
Model : **Peerless - 8AEF17Q**

Flow (US gpm)	Head (psi)	Eff. (%)	Power (hp)	Speed (RPM)
2500	**130**	**76.3**	**248.5**	**2100**
Liquid	Temp. (°F)	Sp. Gravity	Visc. (cSt)	Dia. (inch)
Water	**68**	**1.000**	**1.007**	**14.85**

Typical Specification:

Type AEF Horizontal Split Case Single Stage Fire Pump Typical Specifications

General: **The pumps furnished for fire protection service shall be supplied with the specified drivers, controls and pump accessory items by the pump manufacturer. The pump, driver and control shall be**

( ) Underwriters Laboratories (UL) Listed
( ) Factory Mutual Research Corporation (FM) Approved
( ) Underwriters Laboratories-Canada (ULC) Listed

for fire protection service. The pumping equipment shall be installed as recommended in the National Fire Protection Association (NFPA) Pamphlet 20, Standard for the Installation of Centrifugal Fire Pumps.

- **The fire pump shall be designed to deliver** 2500 US gpm **at a total differential pressure of** 130 psi**.**
- **The fire pump shall also be capable of delivering not less than 150% of rated flow at not less than 65% of rated head.**
- **The pump(s) shall be a Peerless Pump Company model** 8AEF17Q **and shall be furnished with driver, controllers and accessories as detailed in this specification.**
- **Pump manufacturer shall have unit responsibility for the proper operation of the complete unit assembly as indicated by field acceptance tests.**

Manufacturer's Factory Tests: **Each individual pump shall be hydrostatically tested and run tested prior to shipment The pump shall be hydrostatically tested at a pressure of not less than one and one-half times the no flow (shut off) head of the pump's maximum diameter impeller plus the maximum allowable suction head but in no case less than 250 psig.**

Field Acceptance Test: **A field acceptance performance test shall be conducted upon completion of pump installation. The test shall be made by flowing water through calibrated nozzles, approved flow meters or other such accurate devices as may be selected by the authority having jurisdiction. The test shall be conducted as recommended in NFPA Pamphlet 20 by**

( ) the installing contractor
( ) the owner
( ) the owner's representative
( ) (other) CPR **in the presence of the authority having jurisdiction and with that authority's**

final approval and acceptance. Failure to submit documentation offactory and field tests will be just cause for equipment rejection.

Horizontal Centrifugal Pumps: **The fire pump shall be of horizontal centrifugal single stage construction specifically labeled for fire service and shall be a Peerless Pump Company model 8AEF17Q. The pump shall be c onnected to the (fire standpipe) (fire sprinkler) (underground fire main) system. The suction supply for the fire pump shall be from a (public service water main) (elevated storage tank) (ground storage tank) (underground reservoir) at a maximum pressure of _______ poundsper square inch (psi) and a minimum pressure of_______ psi. The pump casing shall be cast iron with __10__ inch 125 pound ANSI rated suction and ____8____ inch(~~125~~) (250) pound ANSI rated discharge flanges machined to American National Standards Institute (ANSI) dimensions.**

~~Electric Motors: **The pump driver shall be horizontal foot mounted ball bearing induction motor rated ______ horsepower, 3 phase, (50)(60) Hertz with (open drip-proof)(totally enclosed fan cooled) NEMA enclosure for operation on _________ volt _____ __phase service. The motor locked rotor current shall not exceed the values stated in NFPA Pamphlet 20. The motor shall be mounted on a steel base common to the pump and shall be connected to the pump with a flexible coupling protected by a suitable guard . The fire pump manufacturer shall accurately align the pump and motor shafts prior to shipment. After field installation but prior to grouting the base, a millwright or similarly qualified person shall check and verify or correct the shaft alignment.**~~

~~Electric Motor Controllers: **The automatic electric motor controller shall be (UL listed)(FM approved) (ULC Listed) specifically for fire pump service. The controller shall be designed for**~~

~~**( ) full voltage**~~
~~**( ) part winding**~~
~~**( ) primary reactor reduced voltage**~~
~~**( ) wye-delta open transition**~~
~~**( ) wye-delta closed transition**~~
~~**( ) auto-transformer**~~
~~**( ) solid state reduced voltage soft start-stop**~~

~~**type starting. The controller shall be rated for the horsepower specified in this specification's electric motors section. The controller shall be capable of interrupting a short circuit current at least equal to the available short circuit current in the controller supply circuit. This fire pump controller installation requires an withstand rating of not less than __________ amps RMS symmetrical at an operating voltage of__________ volts.**~~

~~**The controller shall be:**~~

~~**( ) floor or wall mounted for electrical connection to ________the motor by the equipment installer.**~~
~~**( ) mounted on a common base with the fire pump ________ and wired to the motor by the pump manufacturer.**~~

Fittings: **The pump manufacturer shall furnish piping accessory items for the pump installation which will adapt the pump connections to the fire protection system and test connection as follows. Fittings subjected to pump discharge pressure shall b e ANSI (125)(250) pound rating. Fittings subjected to suction pressure shall be ANSI 125 pound rating.**

( ) eccentric tapered suction reducer
( ) concentric tapered discharge increaser

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) hose valve test head
) hose valves with caps and chains
( ) pump casing relief valve
) automatic air release valve
) hose valve head drain valve
) suction and discharge pressure gauges
( ) (venturi)(pitot tube) test flow meter

Additional accessories required when pump is engine or steam turbine driven:

( ) main reliefvalve:
( ) direct acting (spring actuated)
) pilot operated (hydraulically actuated)
) relief valve overflow cone, enclosed type
( ) discharge tee with elbow (for mounting relief valve)

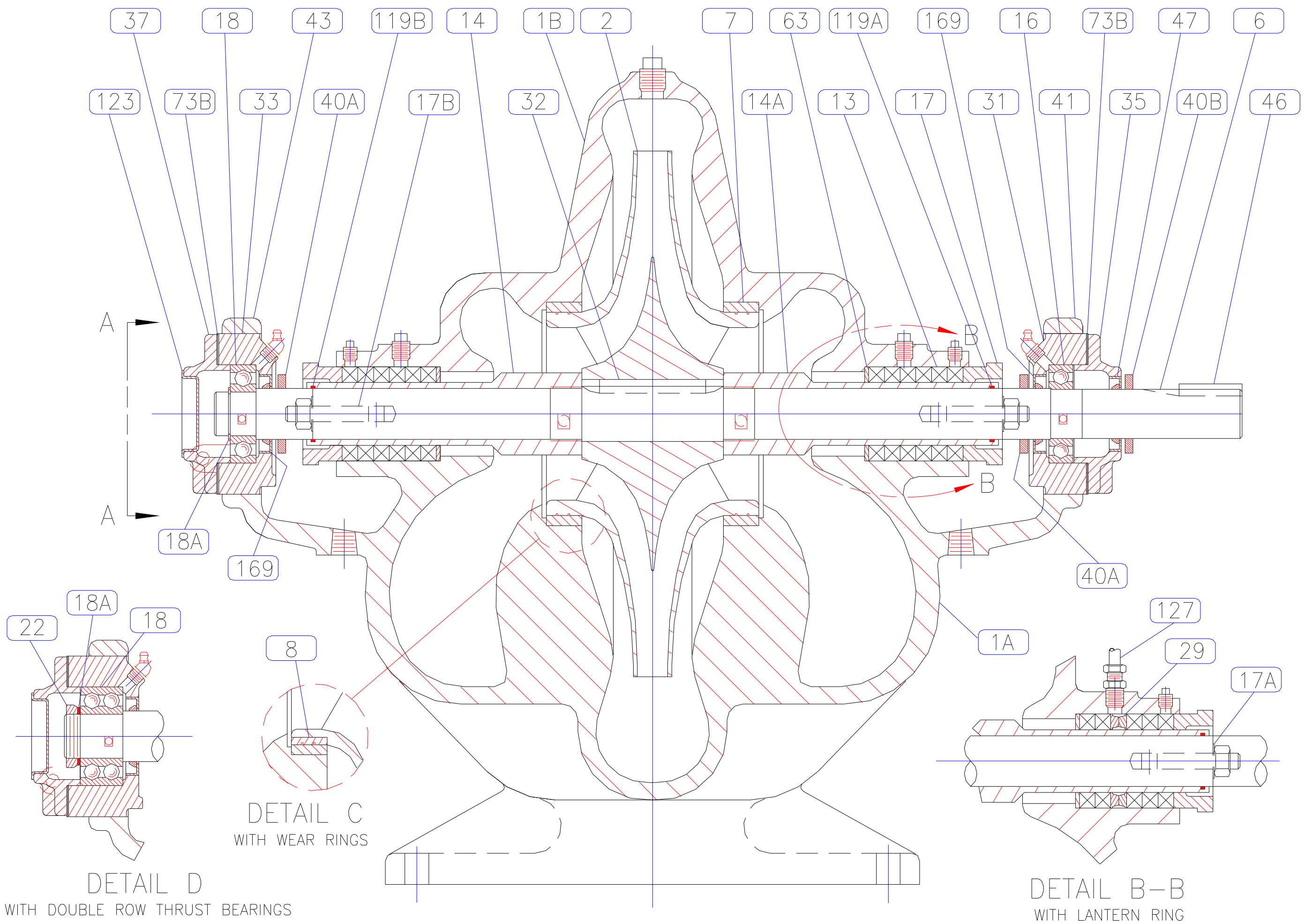
Diesel Engines: **The pump driver shall be a horizontal shaft type internal combustion engine Model** JW6H-UFADD0-D **__________-manufactured by:** Clarke **rated at** 2100**, clockwise rotation viewed from the end opposite the pump. The engine shall be provided by the pump manufacturer with, at a minimum, the following accessories for automatic operation.**

(X) cooling waterlines, pressure regulator, strainer, bypass lines and necessary fittings for engine cooling system, pre-piped and factory mounted.
(X) flexible exhaust connector
(X) residential exhaust silencer
(X) engine jacket water heater, factory installed.
(X) one set dual batteries, lead acid storage type.
(X) fuel system as recommended in NFPA Pamphlet20
(X) fuel storage tank sized to provide a minimum supply of one gallon offuel per engine maximum rated horsepower plus 5% for sump area plus 5% for expansion area. The tank shall be furnished with legs for floor mounting and with a direct reading le vel gauge.
( ) The engine shall be run tested with the pump by the pump manufacturer prior to shipment.

Engine Controllers: **The automatic engine controller shall be (ULlisted)(FM approved) specifically for fire pump service. The controller must be capable of performing or contain the following features:**

(X) Built in battery charger
( ) time clock for weekly automatic test
( ) system pressure recorder
( ) timing relay for automatic stop
( ) power failure start
( ) low fuellevel switch
( ) pump roomalarm audible and visual signals
( ) The controller shall be wired to the corresponding engine function terminals and shall be mounted on a common base with the engine and pump. A complete running test of the base mounted controller, engine and pump shall be performed by the pump manufacturer prior to shipment.

( ) The engine controller shall be floor mounted for electrical connection to the engine by the equipment installer.



Project :	Artic Cold	**Capacity:**	2500 (US gpm)	**Frame/Model:**	JW6H-UFADD0-D
Customer:	J.F. Ahern Co.	**Total Head:**	130 (psi)	**Elec. Spec.:**	DC/1 Ph. 12/230 V. 60 Hz
Item No.:	1	**Pump Speed:**	2100 (RPM)	**Service Factor:**	1
Quote No. :	2047796	**Impeller Dia.:**	14.85 (inch)	**Rotation:**	Clockwise
Pump Model:	Peerless - 8AEF17Q	**Power:**	351 (hp)	**Enclosure/Type:**	

Capitol Pump Resources
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Date : Thursday, April 02, 2020
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CAST IRON BRONZE FITTED

ITEM NUMBER	DESCRIPTION	MATERIAL
1A, 1B	UPPER AND LOWER CASING	CAST IRON
2	IMPELLER	BRONZE
6	PUMP SHAFT	STEEL ①
7	CASING RING	BRONZE
8	IMPELLER RING (OPTIONAL)	BRONZE
13	PACKING RING	GRAPHITED / PTFE
14	SHAFT SLEEVE (RH)	304 STAINLESS STEEL ①
14A	SHAFT SLEEVE (LH)	304 STAINLESS STEEL ①
16	INBOARD BALL BEARING	STEEL ASSEMBLY
17	PACKING GLAND	304 STAINLESS STEEL
17B	GLAND BOLT	STEEL
18	OUTBOARD BALL BEARING	STEEL ASSEMBLY
18A	BEARING RETAINING RING	STEEL
22	BEARING LOCKNUT	STEEL
29	LANTERN RING (OPTIONAL)	PTFE
31	INBOARD BEARING HOUSING	CAST IRON
32	IMPELLER KEY	STAINLESS STEEL
33	OUTBOARD BEARING HOUSING	CAST IRON
35	INBOARD BEARING HOUSING COVER	CAST IRON
37	OUTBOARD BEARING HOUSING COVER	CAST IRON
40A	INBOARD DEFLECTOR	RUBBER
40B	OUTBOARD DEFLECTOR	RUBBER
41	INBOARD BEARING HOUSING CAP	CAST IRON
43	OUTBOARD BEARING HOUSING CAP	CAST IRON
46	COUPLING KEY	STEEL
47	INBOARD BEARING COVER SEAL	STEEL/RUBBER ASSEMBLY
63	STUFFING BOX BUSHING	BRONZE
73A	CASING GASKET (NOT SHOWN)	VEGETABLE FIBER
73B	BEARING COVER GASKET	FIBER
77	LUBRICATOR	ZINC DIE-CAST/PLASTIC ASSEMBLY
119A	O RING, SHAFT SLEEVE	BUNA N RUBBER
119B	O RING, SHAFT SLEEVE	BUNA N RUBBER
123	BEARING END COVER	STEEL
127	WATER SEAL PIPING (OPTIONAL)	COPPER WITH BRASS FITTINGS
169	BEARING HOUSING SEAL	STEEL/RUBBER ASSEMBLY

① OPTIONAL MATERIAL AISI 416 STAINLESS STEEL

Project :	Artic Cold	**Capacity:**	2500 (US gpm)	**Frame/Model:**	JW6H-UFADD0-D
Customer:	J.F. Ahern Co.	**Total Head:**	130 (psi)	**Elec. Spec.:**	DC/1 Ph. 12/230 V. 60 Hz
Item No.:	1	**Pump Speed:**	2100 (RPM)	**Service Factor:**	1
Quote No. :	2047796	**Impeller Dia.:**	14.85 (inch)	**Rotation:**	Clockwise
Pump Model:	Peerless - 8AEF17Q	**Power:**	351 (hp)	**Enclosure/Type:**	

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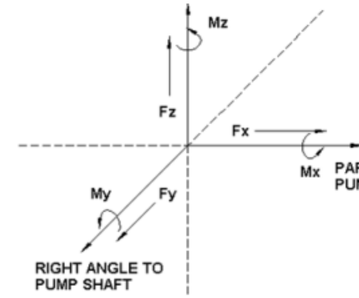
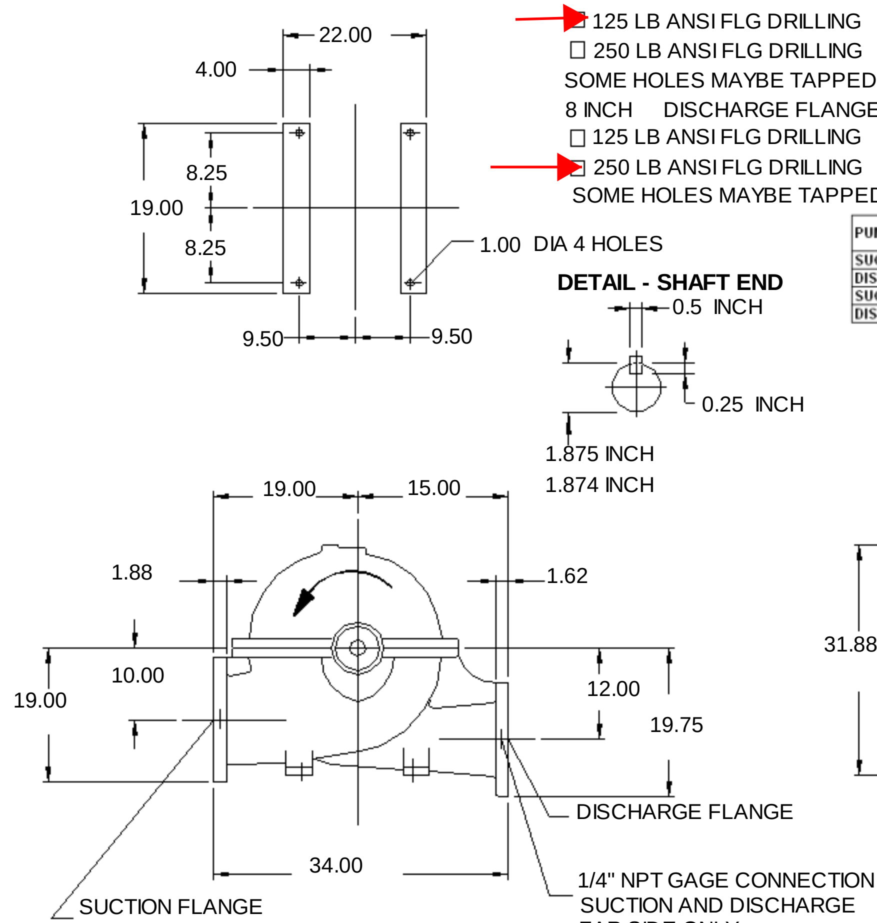
NOZZLE LOADING MAX IMUM FORCES & MOMENTS*

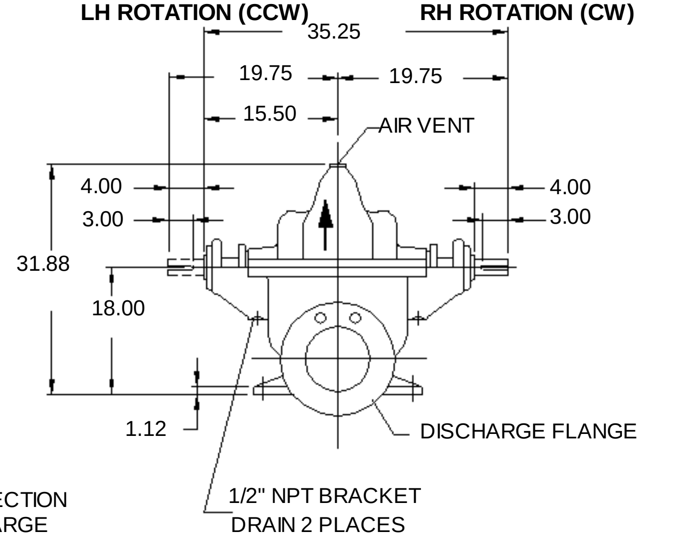


* The pump suction and discharge piping must be restrained and supported near the pump to avoid application of forces and moments to pump casing.

PUMP FLANGE	UNITS	AXIS			UNITS	AXIS		
		Fx	Fy	Fz		Mx	My	Mz
SUCTION	Lb	930	2330	930	Lb-Ft	2500	5000	2500
DISCHARGE	Lb	800	2000	800	Lb-Ft	2000	4000	2000
SUCTION	N	4137	10364	4137	N-m	11121	22241	11121
DISCHARGE	N	3559	8896	3559	N-m	8896	17793	8896

10 INCH SUCTION FLANGE
☐ 125 LB ANSI FLG DRILLING
☐ 250 LB ANSI FLG DRILLING
SOME HOLES MAYBE TAPPED
8 INCH DISCHARGE FLANGE
☐ 125 LB ANSI FLG DRILLING
☐ 250 LB ANSI FLG DRILLING
SOME HOLES MAYBE TAPPED





AGENCY APPROVAL/LISTING: FM/UL

PUMP WT 1010 LB / 459 Kg

Dimensions in (inch)

Project :	Artic Cold	**Capacity:**	2500 (US gpm)	**Frame/Model:**	JW6H-UFADD0-D
Customer:	J.F. Ahern Co.	**Total Head:**	130 (psi)	**Elec. Spec.:**	DC/1 Ph. 12/230 V. 60 Hz
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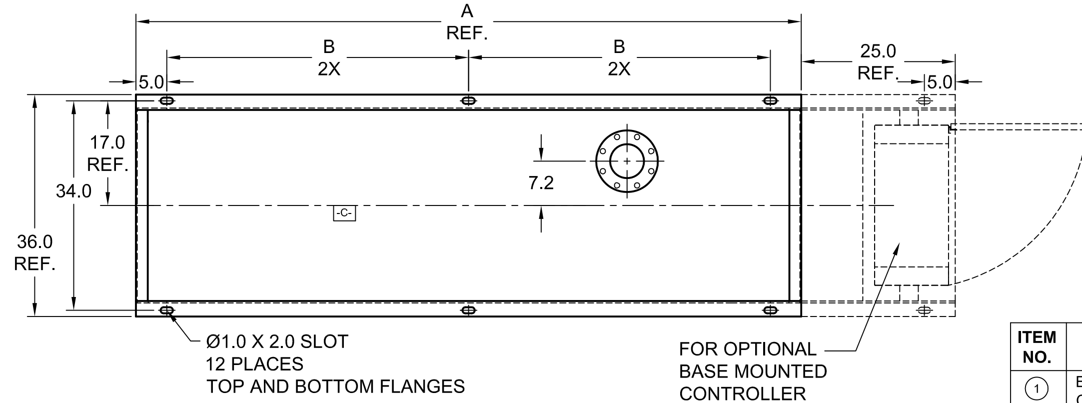
CLARKE FIRE PUMP DRIVERS
EPA NSPS TIER 3 ENGINE MODELS
HSC APPLICATIONS

-A- - MOUNTING FACE OF FLYWHEEL
-B- - ENGINE CRANKSHAFT HORIZONTAL CENTERLINE
-C- - ENGINE CRANKSHAFT VERTICAL CENTERLINE
-D- - PUMP SHAFT HORIZONTAL CENTERLINE



PEERLESS PUMP

Horizontal Split Case
AEF Pumps
AF Pumps

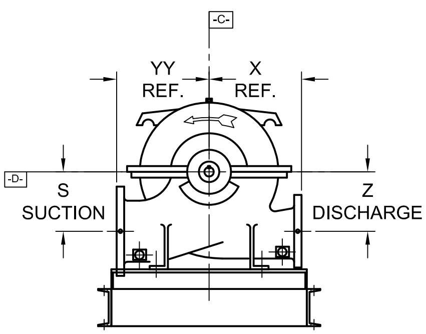
ITEM NO.	DESCRIPTION	CONNECTION SIZE
1	EXHAUST OUTLET CONNECTION	6" 150# FLG.
2	RAW WATER OUTLET	SEE NOTE 6.
3	FUEL SUPPLY CONNECTION	1/2" NPTF
4	FUEL RETURN CONNECTION	3/8" NPTF
5	HEATER JUNCTION BOX	VOLTAGE REQUIREMENTS: AC CONNECTION HEATER 2500 WATTS STD- 230 VAC ±5%-10%

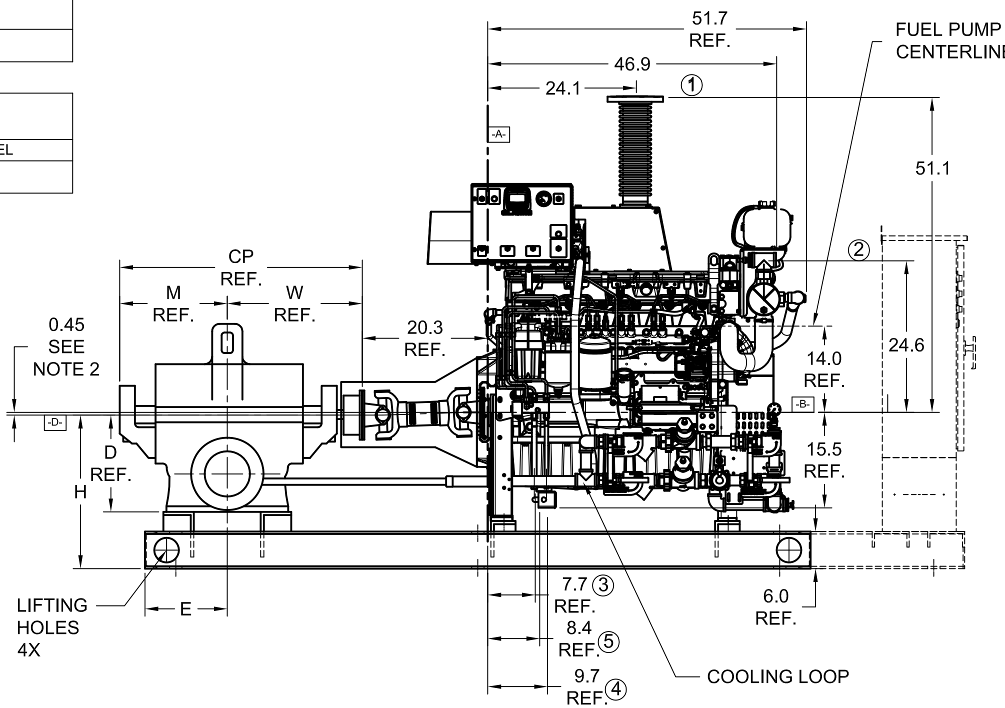
UL LISTED DRIVESHAFTS	
ENGINE MODEL	DRIVESHAFT MODEL
JW6H-UFAD~~70, F0, J0,~~ D0*	CDS50-SC
JW6H-UFAD80	CDS50-SC**

*PLD OPTION AVAILABLE FOR THIS MODEL
**2100 RPM ONLY

NON-LISTED DRIVESHAFTS	
ENGINE MODEL	DRIVESHAFT MODEL
JW6H-UFAD80	SC81A***

***1760 RPM ONLY





NOTES:
1. GENERAL TOLERANCE: UNLESS OTHERWISE SPECIFIED, ALL DIMENSIONS ARE IN INCHES AND VARY 0.38".
2. THE DRIVE SHAFT IS DESIGNED TO OPERATE AT A 2° ANGLE WITH THE INPUT AND OUTPUT SHAFTS IN PARALLEL. THE ENGINE CRANKSHAFT IS TO BE SET WITH A PARALLEL OFFSET OF 0.45 ± 0.11 INCHES VERTICALLY ABOVE THE PUMP SHAFT AND 0.00" ±0.11 INCH PARALLEL OFFSET HORIZONTALLY RIGHT OR LEFT OF THE PUMP SHAFT. REFER TO THE CERTIFIED DRIVESHAFT INSTRUCTIONS MANUAL FOR ALIGNMENT INSTRUCTIONS.
3. BASE MUST BE COMPLETELY FILLED WITH GROUT PER NFPA 20.
4. PUMP IS CW (CLOCKWISE) ROTATION WHEN VIEWED FROM THE COUPLING END.
5. SUCTION AND DISCHARGE FLANGES DRILLED PER ANSI B16.1 (IF APPLICABLE).
6. RAW WATER OUTLET SIZE VARIES BASED UPON SITE CONDITIONS. DEFAULT SIZE: 1-1/2" NPT
7. CAUTION: ALL PLUMBING MUST BE SUPPORTED AND/OR ISOLATED SO THAT NO WEIGHT OR STRESS IS APPLIED TO ANY ENGINE COMPONENT.
8. CAUTION: SPREADER BARS REQUIRED TO MOVE PACKAGE. DAMAGE DUE TO IMPROPER HANDLING IS NOT WARRANTABLE.

PUMP TYPE	PUMP SIZE		DIMENSIONS											
	DISCH.	SUCT.	A	B	H	E	M	W	CP	D	YY	X	S	Z
6AEF14/G/Q	6	8	98.0	44.0	24.0	12.5	13.8	17.5	31.3	15.0	16.0	14.5	9.0	9.5
6AEF18	6	8	98.0	44.0	24.0	10.3	15.5	19.8	35.3	15.0	16.0	17.0	9.0	10.5
~~8AEF15~~	~~8~~	~~10~~	~~98.0~~	~~44.0~~	~~25.0~~	~~11.0~~	~~14.8~~	~~19.0~~	~~33.8~~	~~16.0~~	~~17.7~~	~~16.0~~	~~9.0~~	~~10.0~~
8AEF17	8	10	98.0	44.0	27.0	10.3	15.5	19.8	35.3	18.0	19.0	15.0	10.0	12.0
~~8AEF20~~	~~8~~	~~10~~	~~108.0~~	~~49.0~~	~~28.0~~	~~16.0~~	~~18.8~~	~~24.0~~	~~42.8~~	~~18.0~~	~~20.0~~	~~21.0~~	~~11.0~~	~~13.0~~
10AEF16	10	12	108.0	49.0	28.0	16.0	18.8	24.0	42.8	18.0	21.0	16.5	11.0	12.0
10AEF20	10	12	108.0	49.0	30.0	14.0	20.5	26.0	46.5	19.5	22.0	23.0	11.0	14.0
12AF19	12	14	128.0	59.0	28.0	24.0	30.1	36.0	66.1	21.0	24.0	28.0	12.0	13.5

ALL VIEWS 3rd ANGLE PROJECTION

Certified for: ☐ Approval ☐ Construction By: Date: Listed: ☐ UL ☐ FM

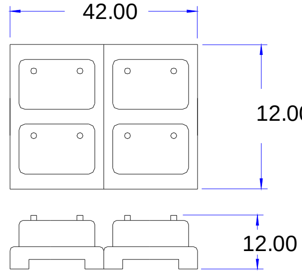
Project:	Capacity:	Engine Supplier: CLARKE
Customer:	Total Pressure:	Engine Model:
Item / P.O. No.:	Pump Speed:	Engine Preheater Voltage:
Quote No.:	Power:	Pump Serial No.:
Pump Model:	Rotation: CLOCKWISE (Right Hand)	SO No.:

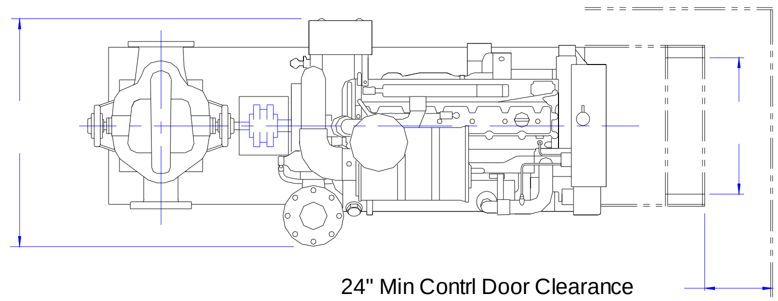
C132726 RevH
14SEP17

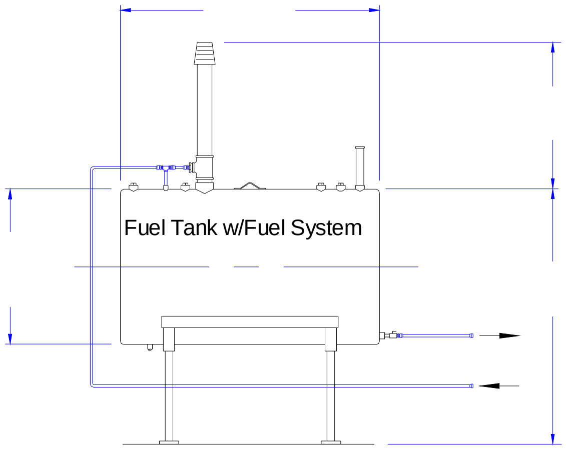
AGENCY APPROVAL/LISTING:
FM/UL

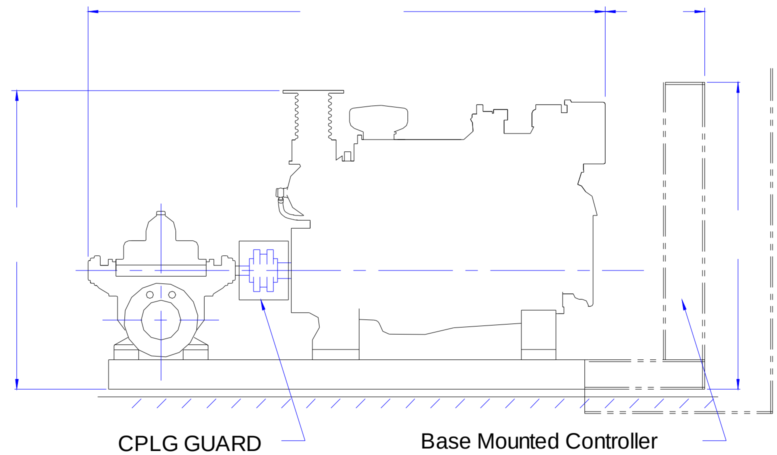
INSTALLING CONTRACTOR (S) TO INSTALL EQUIPMENT IN ACCORDANCE WITH LATEST EDITIONS OF NATIONAL ELECTRIC CODE, LOCAL CODES AND NFPA PAMPHLET NO. 20 APPLICABLE TO FIRE PUMP INSTALLATIONS

Battery Set









NOTE:

GO TO PDF TAB "PDF DOCS" DROP DOWN ARROW TO "B-1530 DIESEL ENGINE DRIVE HORIZONTAL FIRE PUMP OUTLINE DRAWINGS" FOR UNIT AND DIESEL ENGINE ACCESSORIES OUTLINE DRAWINGS

Dimensions in (inch)

Project :	Artic Cold	**Capacity:**	2500 (US gpm)	**Frame/Model:**	JW6H-UFADD0-D
Customer:	J.F. Ahern Co.	**Total Head:**	130 (psi)	**Elec. Spec.:**	DC/1 Ph. 12/230 V. 60 Hz
Item No.:	1	**Pump Speed:**	2100 (RPM)	**Service Factor:**	1
Quote No. :	2047796	**Impeller Dia.:**	14.85 (inch)	**Rotation:**	Clockwise
Pump Model:	Peerless - 8AEF17Q	**Power:**	351 (hp)	**Enclosure/Type:**	

PEERLESS PUMP ®

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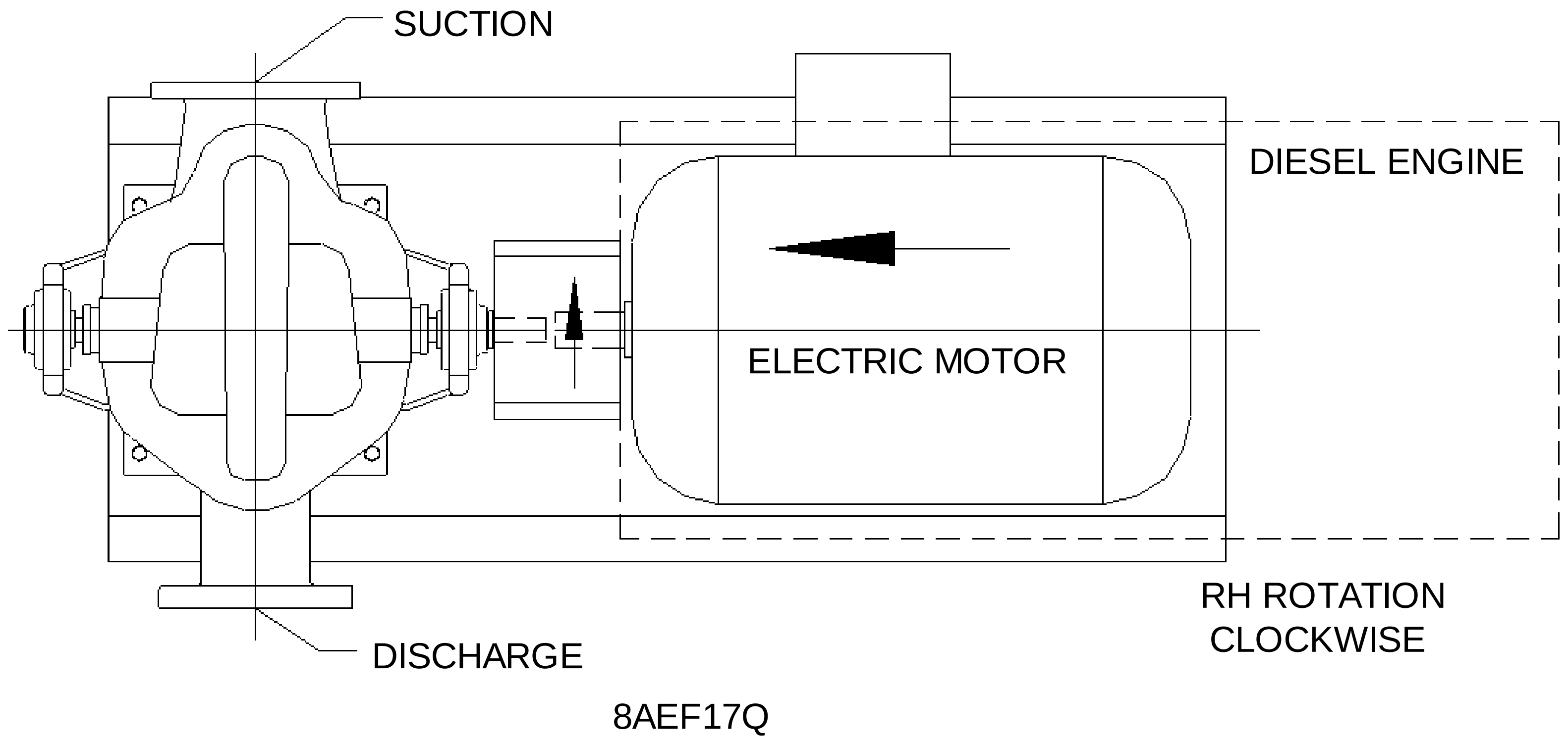

Dimensions in (inch)

Project :	Artic Cold	**Capacity:**	2500 (US gpm)	**Frame/Model:**	JW6H-UFADD0-D
Customer:	J.F. Ahern Co.	**Total Head:**	130 (psi)	**Elec. Spec.:**	DC/1 Ph. 12/230 V. 60 Hz
Item No.:	1	**Pump Speed:**	2100 (RPM)	**Service Factor:**	1
Quote No. :	2047796	**Impeller Dia.:**	14.85 (inch)	**Rotation:**	Clockwise
Pump Model:	Peerless - 8AEF17Q	**Power:**	351 (hp)	**Enclosure/Type:**	

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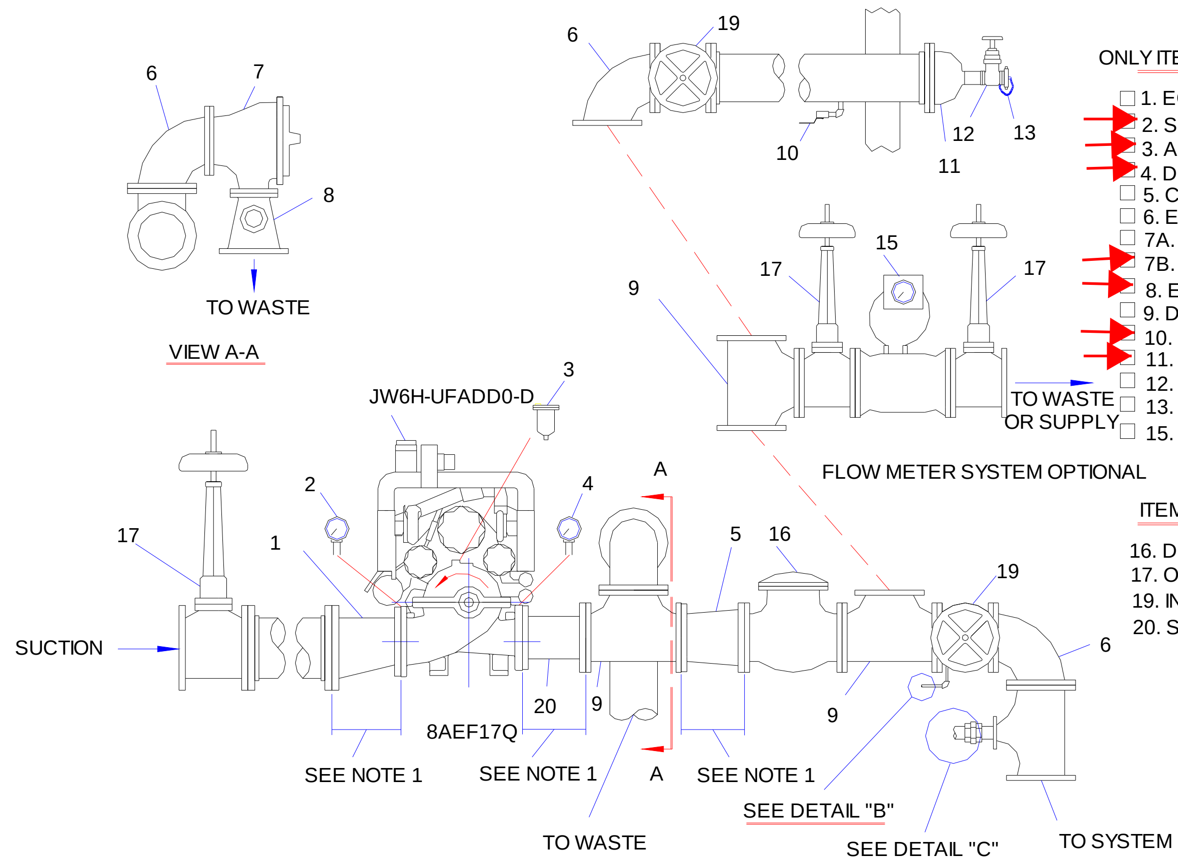
NOTES:
1. ITEM MAY NOT BE REQUIRED IF PUMP SUCTION AND DISCHARGE SIZES ARE EQUAL TO OR GREATER THAN NFPA RECOMMENDED PIPE SIZES
2. LOCATE AIR RELEASE AT HIGH POINT OF CASING



ONLY ITEMS MARKED ARE SUPPLIED

1. ECCENTRIC SUCTION REDUCER
2. SUCTION GAUGE
3. AUTOMATIC AIR RELEASE VALVE
4. DISCHARGE GAUGE
5. CONCENTRIC DISCHARGE REDUCER
6. ELBOW 90 DEGREE
7A. MAIN RELIEF VALVE (DIRECT ACTING)
7B. MAIN RELIEF VALVE (PILOT OPERATED)
8. ENCLOSED WASTE CONE
9. DISCHARGE TEE
10. DRAIN VALVE
11. HOSE VALVE HEAD
12. HOSE VALVE
13. HOSE VALVE CAP AND CHAIN
15. FLOW METER

ITEMS SUPPLIED BY OTHERS

16. DISCHARGE CHECK VALVE
17. O S AND Y GATE VALVE
19. INDICATING GATE OR INDICATING BUTTERFLY VALVE
20. SPOOL PIECE

PIPING ARRANGEMENT FOR PRESENTATION PURPOSES ONLY
REFER TO NFPA REQUIREMENTS AND LOCAL PLUMBING CODES FOR DETAILS

Dimensions in (inch)

Project :	Artic Cold	**Capacity:**	2500 (US gpm)	**Frame/Model:**	JW6H-UFADD0-D
Customer:	J.F. Ahern Co.	**Total Head:**	130 (psi)	**Elec. Spec.:**	DC/1 Ph. 12/230 V. 60 Hz
Item No.:	1	**Pump Speed:**	2100 (RPM)	**Service Factor:**	1
Quote No. :	2047796	**Impeller Dia.:**	14.85 (inch)	**Rotation:**	Clockwise
Pump Model:	Peerless - 8AEF17Q	**Power:**	351 (hp)	**Enclosure/Type:**	

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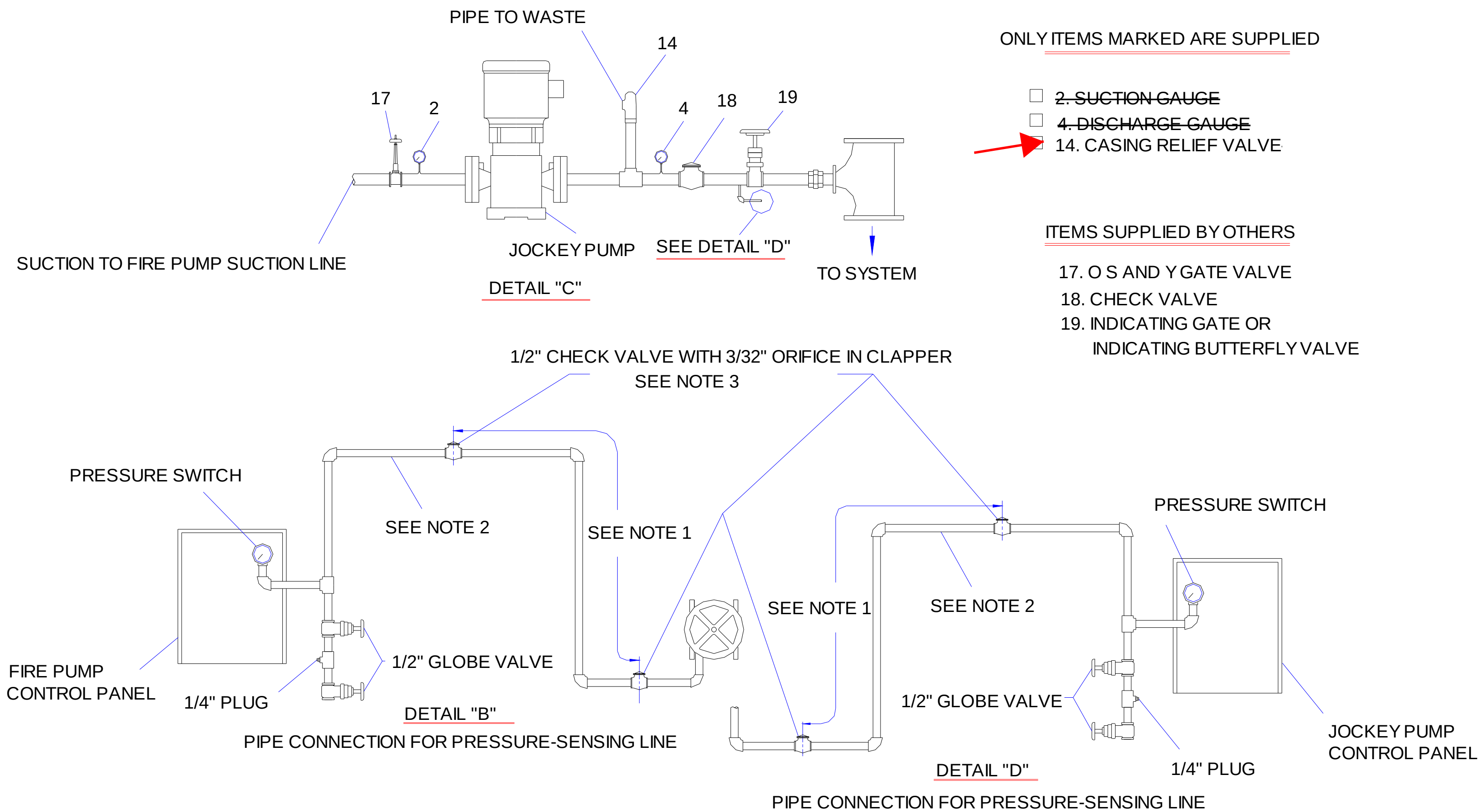
NOTES:

1. NOT LESS THAN 5'-0"
2. NOT LESS THAN 1/2" BRASS PIPE WITH BRASS FITTINGS OR EQUIVALENT
3. IF WATER IS CLEAN, A GROUND FACE UNION WITH NON-CORROSIVE DIAPHRAM AND 3/32" ORIFICE, MAY BE USED



PIPING ARRANGEMENT FOR PRESENTATION PURPOSES ONLY
51478.00

Dimensions in (inch)

Project :	Artic Cold	**Capacity:**	2500 (US gpm)	**Frame/Model:**	JW6H-UFADD0-D
Customer:	J.F. Ahern Co.	**Total Head:**	130 (psi)	**Elec. Spec.:**	DC/1 Ph. 12/230 V. 60 Hz
Item No.:	1	**Pump Speed:**	2100 (RPM)	**Service Factor:**	1
Quote No. :	2047796	**Impeller Dia.:**	14.85 (inch)	**Rotation:**	Clockwise
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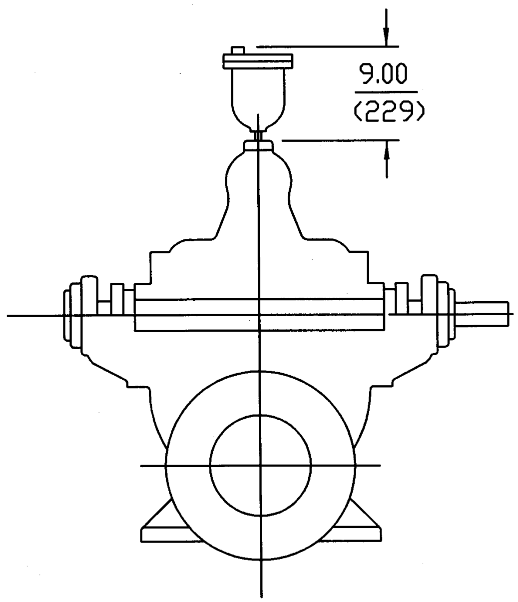
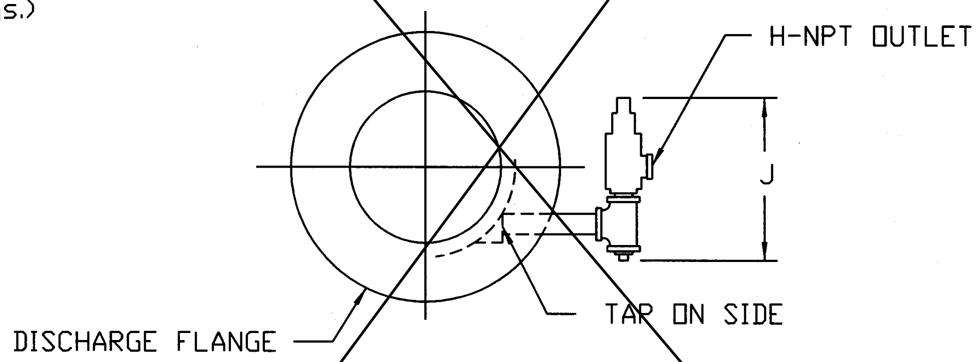
AUTOMATIC AIR RELEASE VALVE
SINGLE STAGE PUMP

☐ MWP 175 PSI UL & FM WT. 9 LBS. (4 kgs.)

☐ MWP 300 PSI UL & FM WT. 9 LBS. (4 kgs.)



CASING RELIEF VALVE
SINGLE PUMPS



☒	H	J	NOTE	WEIGHT
	3/4"	12.00 (305)	4	4 LBS. (1.8 kgs.)
	1.00"	11.00 (279)	5	7 LBS. (3.2 kgs.)

NOTES:

1. ONLY ITEMS CHECKED WILL BE FURNISHED
2. ALL DIMENSIONS ARE IN INCHES / (MILLIMETERS)
3. DO NOT PLUG ANY VALVE OR VENT OUTLET
4. ALL UNITS EXCEPT 10AEF16, 10AEF20, 12AF19B
5. 10AEF16, 10AEF20, 12AF19B
6. ALL AIR VENT & CASING RELIEF VALVE ASSEMBLIES WILL BE SHIPPED LOOSE FOR FIELD MOUNTING.
7. ALL AIR VENT & CASING RELIEF VALVE ASSEMBLIES MUST BE MOUNTED IN A VERTICAL POSITION.

4851139

Dimensions in (inch)

Project :	Artic Cold	**Capacity:**	2500 (US gpm)	**Frame/Model:**	JW6H-UFADD0-D
Customer:	J.F. Ahern Co.	**Total Head:**	130 (psi)	**Elec. Spec.:**	DC/1 Ph. 12/230 V. 60 Hz
Item No.:	1	**Pump Speed:**	2100 (RPM)	**Service Factor:**	1
Quote No. :	2047796	**Impeller Dia.:**	14.85 (inch)	**Rotation:**	Clockwise
Pump Model:	Peerless - 8AEF17Q	**Power:**	351 (hp)	**Enclosure/Type:**	

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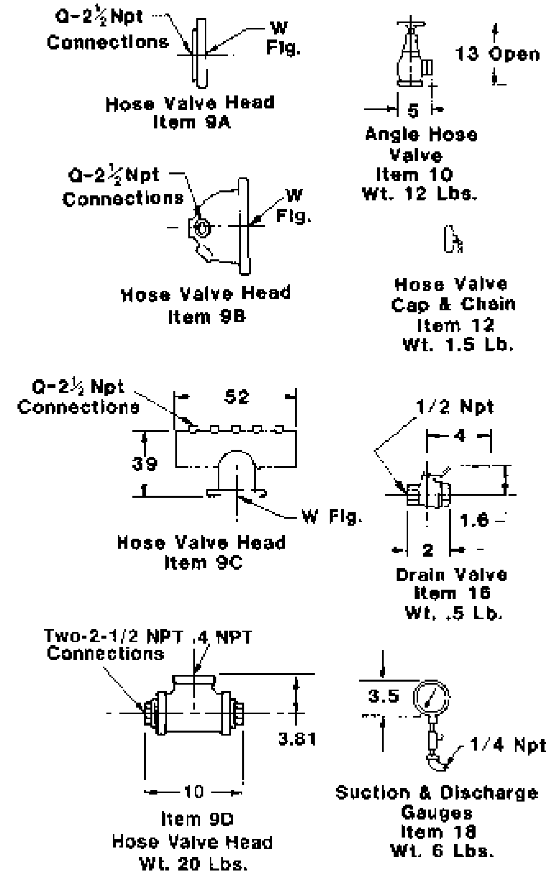
FIRE PUMP FITTINGS OUTLINE

✓	Item No.	✓	GPM	✓	GPM	✓	GPM	✓	GPM	✓	GPM	Description	✓	Maximum Working Pressure PSIG						
	9A		250	-	-	-	-	-	-	-	-	Hose Valve Head		175		-	-	-	-	-
	9B		500		750		1000		1250	-	-	Hose Valve Head		175		200		500		600
	9B		1500		2000		2500	-	-	-	-	Hose Valve Head		175		200		500		600
	9C		3000		3500		4000		4500		5000	Hose Valve Head		-		200		-		600
	9D		500	-	-	-	-	-	-	-	-	Hose Valve Head		300	-	-	-	-	-	-
	10	Angle Hose Valve				Qty of	8					Wt. Lbs.		300	-	-	-	-	-	-
	12	Cap & Chain				Qty of	8					Wt. Lbs.		-	-	-	-	-	-	-
	16	Drain Valve				Qty of								400		600	-	-	-	-

✓	Item No.	Description	Qty of (Sets)	Gauge Type	Dial Graduations: Outer Scale	Dial Graduations: Inner Scale
	18	Suction and Discharge Gauge Set (Each Furnished with Gauge Cock)		Suction	-15 PSI to 0 to 300 PSI	-1 BAR to 0 to 20 BAR
				~~Discharge~~	~~0 PSI to 300 PSI~~	~~0 to 20 BAR~~
				Discharge	0 to 600 PSI	0 BAR to 41 BAR

✓	ANSI Std. Dimension Flange	✓ Dimension	250	500	750	1000	1250	1500	2000	2500	3000	3500	4000	4500	5000
	125	W	3	6	6	6	8	8	8	10	-	-	-	-	-
	125	W	3	6	8	8	10	10	10	12	-	-	-	-	-
	250	W	-	6	8	8	8	8	8	12	-	-	-	-	-
	250	W	-	6	6	6	10	10	10	10	-	-	-	-	-
	300	W	-	4	6	6	8	8	8	10	10	12	12	12	12
	300	W	-	-	-	-	-	-	-	-	12	14	14	14	14
Quantity		HV C&C	1	2	3	4	6	6	6	8	12	12	16	16	20
Weight Lb. (Maximum)			25	50	84	84	150	150	150	255	360	360	360	360	360
Item No.			9A	9B	9B	9B	9B	9B	9B	9B	9B	9B	9 B	9B	9C

(Pump Rating GPM)



Notes: 1. Only Items Marked ☑ will be furnished
2. All Dimensions are in inches
3. Hose Valve Threading ______________________-(Specify)

Subject to change without notice

DT4851090
Rev. 08-2010

Dimensions in (inch)

Project :	Artic Cold	**Capacity:**	2500 (US gpm)	**Frame/Model:**	JW6H-UFADD0-D
Customer:	J.F. Ahern Co.	**Total Head:**	130 (psi)	**Elec. Spec.:**	DC/1 Ph. 12/230 V. 60 Hz
Item No.:	1	**Pump Speed:**	2100 (RPM)	**Service Factor:**	1
Quote No. :	2047796	**Impeller Dia.:**	14.85 (inch)	**Rotation:**	Clockwise
Pump Model:	Peerless - 8AEF17Q	**Power:**	351 (hp)	**Enclosure/Type:**	

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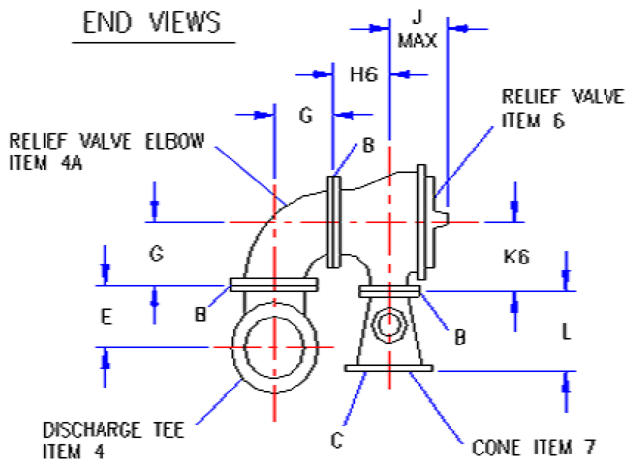
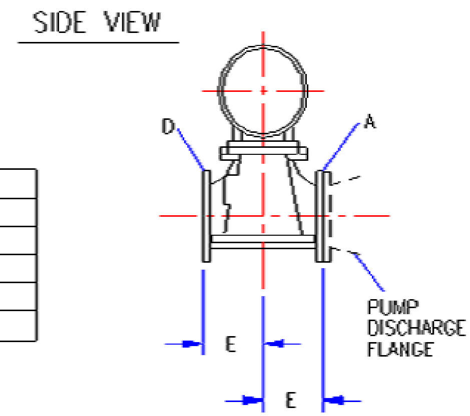
HIGH PRESSURE TEE ASSEMBLY WITH PILOT OPERATED VALVE





✓	Item	Description
	4	Discharge Tee
	4A	Relief Valve Elbow
	6	Pilot Operated Relief Valve
	7	Overflow Cone

✓	Manufacturer	Model	Listing /Approval				Pressure Range Psi
			3 Inch	4 Inch	6 Inch	8 Inch	
	Watts	1116FM	UL	UL/FM	UL/FM	Not Listed or Approved	100 to 300
	OCV	OCV 108FCA	UL	UL	UL	Not UL Listed	100 to 300
	OCV	OCV 108FCA	FM	FM	FM	FM	60 to 180
	Cla-Val	50B4KG1	UL	UL	UL	Not UL Listed	100 to 300
	Cla-Val	50B4KG1	FM	FM	FM	FM	20 to 200

FOR MORE DETAILS ON CLA-VAL PILOT OPERATED RELIEF VALVES GO TO PDFDOCS DROP DOWN ARROW TO "CLA-VAL Fire Protection Pressure Relief Valves"

Notes:

1 Only Items marked check will be furnished.
2 All dimensions are In Inches.
3 Pump flanges must not be used to support weight of fittings.
4 All fitting flanges will conform to ANSI Standard B16.1 and will be
  a.} 250 Lb. on relief valve Inlet and relief valve elbow.
  b.} 300 Lb. on OCV and Cla-Val Valve inlet.
  c.} 250 or 300 Lb. on tee.
  d.} 125 or 150 Lb. cone Inlet and outlet.
5 All gaskets and bolting are to be supplied by others.
6 All direct acting and pilot operated valves are suitable for a back pressure up to 100 psi.

PAGE 1 OF 2 DWG NO. 4852882 Rev. 7-2002

Dimensions in (inch)

Project :	Artic Cold	**Capacity:**	2500 (US gpm)	**Frame/Model:**	JW6H-UFADD0-D
Customer:	J.F. Ahern Co.	**Total Head:**	130 (psi)	**Elec. Spec.:**	DC/1 Ph. 12/230 V. 60 Hz
Item No.:	1	**Pump Speed:**	2100 (RPM)	**Service Factor:**	1
Quote No. :	2047796	**Impeller Dia.:**	14.85 (inch)	**Rotation:**	Clockwise
Pump Model:	Peerless - 8AEF17Q	**Power:**	351 (hp)	**Enclosure/Type:**	

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Fire Pump Fitting Outline Dimensions High Pressure

DISCHARGE TEE ASSEMBLY WITH PILOT OPERATED RELIEF VALVE																					
										Watts-Muesco			OCV			Cla-Val					
✓	PUMP RATED GPM	MAXIMUM WORKING PRESSURE psi	A (PUMP DISCH)	B	C (C.I.)	C (Fab Stl)	D	E	G	H6	J	K6	H6	J	K6	H6	J	K6	L (C.I.)	L (Fab Stl)	TOTAL ASSEM WT lb
	500	300	3	3	5	5	5	8	6	6.12	13	5.75	4.38	10.38	6.00	4.38	12.50	6.00	8.5	8.5	265
	500	300	4	3	5	5	5	8	6	6.12	13	5.75	4.38	10.38	6.00	4.38	12.50	6.00	8.5	8.5	300
	500	300	5	3	5	5	5	8	6	6.12	13	5.75	4.38	10.38	6.00	4.38	12.50	6.00	8.5	8.5	300
	500	300	3	3	6	-	5	8	6	6.12	13	5.75	4.38	10.38	6.00	4.38	12.50	6.00	8.5	-	265
	500	300	4	3	6	-	5	8	6	6.12	13	5.75	4.38	10.38	6.00	4.38	12.50	6.00	8.5	-	300
	500	300	5	3	6	-	5	8	6	6.12	13	5.75	4.38	10.38	6.00	4.38	12.50	6.00	8.5	-	300
	750	300	4	4	6	6	6	8.5	7	7.12	17	6.75	5.81	11.88	7.81	5.31	13.00	7.50	8.5	8.25	422
	750	300	5	4	6	6	6	8.5	7	7.12	17	6.75	5.81	11.88	7.81	5.31	13.00	7.50	8.5	8.25	427
	750	300	4	4	8	-	6	8.5	7	7.12	17	6.75	5.81	11.88	7.81	5.31	13.00	7.50	10.5	-	422
	750	300	5	4	8	-	6	8.5	7	7.12	17	6.75	5.81	11.88	7.81	5.31	13.00	7.50	10.5	-	427
	1000	300	5	4	8	-	6	8.5	7	7.12	17	6.75	5.81	11.88	7.81	5.31	13.00	7.50	10.5	-	427
	1000	300	6	4	8	-	6	8.5	7	7.12	17	6.75	5.81	11.88	7.81	5.31	13.00	7.50	10.5	-	437
	1250	300	6	6	8	8	8	10	8.5	9	18	8.5	6.50	13.88	10.00	6.50	14.31	10.00	14	7.75	726
	1250	300	6	6	10	-	8	10	8.5	9	18	8.5	6.50	13.88	10.00	6.50	14.31	10.00	14	-	726
	1500	300	6	6	8	8	8	10	8.5	9	18	8.5	6.50	13.88	10.00	6.50	14.31	10.00	14	7.75	726
	1500	300	8	6	8	8	8	10	8.5	9	18	8.5	6.50	13.88	10.00	6.50	14.31	10.00	14	7.75	736
	1500	300	6	6	10	-	8	10	8.5	9	18	8.5	6.50	13.88	10.00	6.50	14.31	10.00	14	-	726
	1500	300	8	6	10	-	8	10	8.5	9	18	8.5	6.50	13.88	10.00	6.50	14.31	10.00	14	-	736
	2000	300	6	6	10	-	10	11.5	8.5	9	18	8.5	6.50	13.88	10.00	6.50	14.31	10.00	14	-	841
	~~2000~~	~~300~~	~~8~~	~~6~~	~~10~~	~~-~~	~~10~~	~~11.5~~	~~8.5~~	~~9~~	~~18~~	~~8.5~~	~~6.50~~	~~13.88~~	~~10.00~~	~~6.50~~	~~14.31~~	~~10.00~~	~~14~~	~~-~~	~~851~~
	2500	300	8	6	10	-	10	11.5	8.5	9	18	8.5	6.50	13.88	10.00	6.50	14.31	10.00	14	-	851
	~~2500~~	~~300~~	~~10~~	~~6~~	~~10~~	~~-~~	~~10~~	~~11.5~~	~~8.5~~	~~9~~	~~18~~	~~8.5~~	~~6.50~~	~~13.88~~	~~10.00~~	~~6.50~~	~~14.31~~	~~10.00~~	~~14~~	~~-~~	~~851~~
	3000	300	8	8	-	12	12	13	10	11.5	20	11	8.50	18.25 *	12.69	8.50	16.31	12.75	-	9	1195
	3000	300	10	8	-	12	12	13	10	11.5	20	11	8.50	18.25 *	12.69	8.50	16.31	12.75	-	9	1210
	3000	300	12	8	-	12	12	13	10	11.5	20	11	8.50	18.25 *	12.69	8.50	16.31	12.75	-	9	1210
	3500	300	10	8	-	12	12	13	10	11.5	20	11	8.50	18.25 *	12.69	8.50	16.31	12.75	-	9	1210
	3500	300	12	8	-	12	12	13	10	11.5	20	11	8.50	18.25 *	12.69	8.50	16.31	12.75	-	9	1210
	4000	300	10	8	-	14	12	13	10	11.5	20	11	8.50	18.25 *	12.69	8.50	16.31	12.75	-	14	1210
	4000	300	12	8	-	14	12	13	10	11.5	20	11	8.50	18.25 *	12.69	8.50	16.31	12.75	-	14	1260
	4500	300	10	8	-	14	14	15	10	11.5	20	11	8.50	18.25 *	12.69	8.50	16.31	12.75	-	14	1385
	4500	300	12	8	-	14	14	15	10	11.5	20	11	8.50	18.25 *	12.69	8.50	16.31	12.75	-	14	1420
	5000	300	12	8	-	14	14	15	10	11.5	20	11	8.50	18.25 *	12.69	8.50	16.31	12.75	-	14	1420

* *Valve must be mounted with stem in the vertical position, refer to factory for fittings to adapt.* Rev 09-04

DT 4852882

Dimensions in (inch)

Project :	Artic Cold	**Capacity:**	2500 (US gpm)	**Frame/Model:**	JW6H-UFADD0-D
Customer:	J.F. Ahern Co.	**Total Head:**	130 (psi)	**Elec. Spec.:**	DC/1 Ph. 12/230 V. 60 Hz
Item No.:	1	**Pump Speed:**	2100 (RPM)	**Service Factor:**	1
Quote No. :	2047796	**Impeller Dia.:**	14.85 (inch)	**Rotation:**	Clockwise
Pump Model:	Peerless - 8AEF17Q	**Power:**	351 (hp)	**Enclosure/Type:**	

Capitol Pump Resources
5891 Mullen Rd SE Lacey WA 98503
Hugh Caulfield
Phone 360-493-1830
Fax 360-923-1841

Date : Thursday, April 02, 2020

— MODEL — TH Series

Test Headers

~~6-inch~~

~~8-inch~~

10-inch

- **Manufactured in Accordance with NFPA 20 Requirements**
- **Developed for UL/FM Approved Fire Systems**
- **Available in sizes ~~4”, 6”, 8” and~~ 10”**
- **Designed to allow 250 gpm per test connection**
- **Use with Cla-Val HV-100-25 Hose Valves**

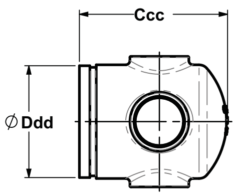
Specifications
- Fusion Bonded Red Epoxy Coated
- Ductile Iron - ASTM A536-65
- Single Body Casting (No Welding)

Flanges
- 150# Class (FF Standard)
- 300# Class (RF Standard)
- Grooved Ends

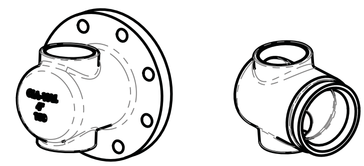
Typical Application: Fire Pump Test Connections

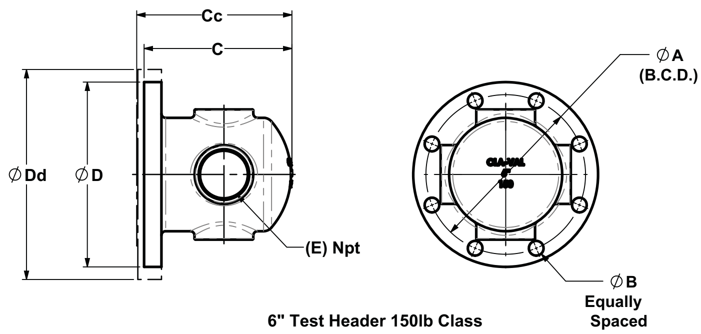
TH Series Test Header Dimensions

Dimension Table														
Size	Pressure Class	∅A (B.C.D.)	B		C	Cc	Ccc	∅D	∅Dd	∅Ddd	E		F	
			Number Of Holes	∅Hole							Number Of Ports	Npt	Number Of Ports (10" Only)	Npt (10" Only)
~~4"~~	~~150lb Flat Face~~	~~7.500~~	~~8~~	~~.750~~	~~7.16~~	-		~~9.00~~	-	-	~~2~~	~~2 1/2" - 8~~	-	-
	~~300lb Raised Face~~	~~7.875~~	~~8~~	~~.875~~	-	~~7.48~~		-	~~10.00~~	-	~~2~~	~~2 1/2" - 8~~	-	-
	~~300lb Grooved Ends~~	-	-	-	-	-	~~7.16~~	-	-	~~4.545/4.469~~	~~2~~	~~2 1/2" - 8~~	-	-
~~6"~~	~~150lb Flat Face~~	~~9.500~~	~~8~~	~~.875~~	~~8.80~~	-		~~11.00~~	-	-	~~4~~	~~2 1/2" - 8~~	-	-
	~~300lb Raised Face~~	~~10.625~~	~~12~~	~~.875~~	-	~~9.24~~		-	~~12.50~~	-	~~4~~	~~2 1/2" - 8~~	-	-
	~~300lb Grooved Ends~~	-	-	-	-	-	~~8.80~~	-	-	~~6.688/6.594~~	~~4~~	~~2 1/2" - 8~~	-	-
~~8"~~	~~150lb Flat Face~~	~~11.750~~	~~8~~	~~.875~~	~~10.06~~	-		~~13.50~~	-	-	~~6~~	~~2 1/2" - 8~~	-	-
	~~300lb Raised Face~~	~~13.000~~	~~12~~	~~1.000~~	-	~~10.56~~		-	~~15.00~~	-	~~6~~	~~2 1/2" - 8~~	-	-
	~~300lb Grooved Ends~~	-	-	-	-	-	~~10.06~~	-	-	~~8.688/8.594~~	~~6~~	~~2 1/2" - 8~~	-	-
10"	~~150lb Flat Face~~	~~14.250~~	~~12~~	~~1.000~~	~~12.22~~	-		~~16.00~~	-	-	~~8~~	~~2 1/2" - 8~~	4	~~2 1/2" - 8~~
	~~300lb Raised Face~~	~~15.250~~	~~16~~	~~1.125~~	-	~~12.91~~		-	~~17.50~~	-	~~8~~	~~2 1/2" - 8~~	4	~~2 1/2" - 8~~
	300lb Grooved Ends	-	-	-	-	-	12.25	-	-	10.813/10.719	8	2 1/2" - 8	4	2 1/2" - 8

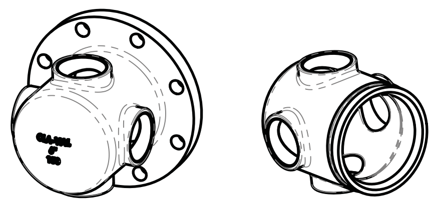


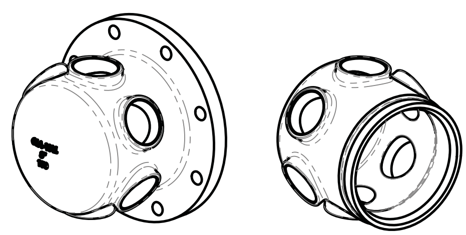
6" Test Header 300lb Class
Grooved Ends Shown

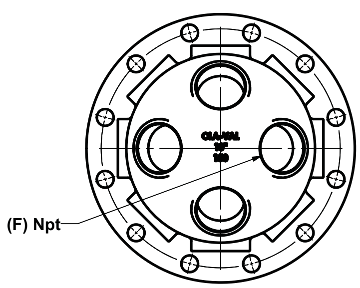

4" Test Header



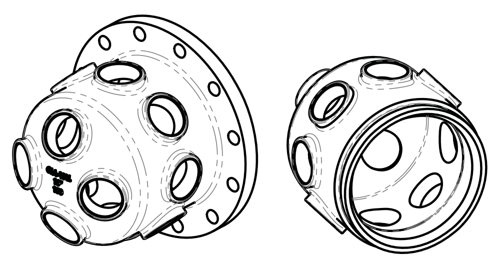
6" Test Header 150lb Class
Flat Face Shown


6" Test Header


8" Test Header



10" Test Header 150lb Class
Flat Face Shown


10" Test Header

CLA-VAL
1701 Placentia Avenue • Costa Mesa CA 92627
800-942-6326 • Fax: 949-548-5441 • Web Site: cla-val.com • E-mail: info@cla-val.com

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4687 Christie Drive
Beamsville, Ontario
Canada L0R 1B4
Phone: 905-563-4963
Fax: 905-563-4040
E-mail sales@cla-val.ca

CLA-VAL EUROPE
Chemin des Mésanges 1
CH-1032 Romanel/
Lausanne, Switzerland
Phone: 41-21-643-15-55
Fax: 41-21-643-15-50
E-mail: cla-val@cla-val.ch

CLA-VAL UK
Dainton House, Goods Station Road
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Kent TN1 2 DH England
Phone: 44-1892-514-400
Fax: 44-1892-543-423
E-mail: info@cla-val.co.uk

CLA-VAL FRANCE
Porte du Grand Lyon 1
ZAC du Champ du Périer
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Fax: 33-4-72-25-04-17
E-mail: cla-val@cla-val.fr

CLA-VAL PACIFIC
45 Kennaway Road
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CLARKE PLD

PRESSURE LIMITING DRIVERS

SERIES
~~JU4H~~ JW6H
~~JU6H~~ JX6H

PLD MODELS FOR DISCHARGE AND SUCTION PRESSURE LIMITING CONTROL
FM-UL-cUL APPROVED RATINGS BHP/*kW*

Certified Models ♦	NSPS Emissions Tier	Engine Fuel Management Control	Discharge Control Limiting Pressure (psi)	Suction Control Limiting Pressure (psi)	Certified Speed (RPM) & Nameplate Power (BHP/*kW*)									
					1760		2100		2350		2400		2600	
~~JU4H-UF10-P1~~	~~T1 Compliant~~	~~Mechanical~~	~~100, 170, 240 (A)~~		~~**41**~~	~~*31*~~	~~**51**~~	~~*38*~~	~~**55**~~	~~*41*~~				
~~JU4H-UF12-P1~~	~~T1 Compliant~~	~~Mechanical~~	~~100, 170, 240 (A)~~						~~**55**~~	~~*41*~~			~~**59**~~	~~*44*~~
~~JU4H-UF20-P1~~	~~T1 Compliant~~	~~Mechanical~~	~~100, 170, 240 (A)~~		~~**60**~~	~~*45*~~	~~**67**~~	~~*50*~~	~~**72**~~	~~*54*~~				
~~JU4H-UF22-P1~~	~~T1 Compliant~~	~~Mechanical~~	~~100, 170, 240 (A)~~						~~**72**~~	~~*54*~~			~~**75**~~	~~*56*~~
~~JU4H-UF40-P1~~	~~T1 Compliant~~	~~Mechanical~~	~~100, 170, 240 (A)~~		~~**94**~~	~~*70*~~	~~**105**~~	~~*78*~~	~~**106**~~	~~*79*~~				
~~JU4H-UF42-P1~~	~~T1 Compliant~~	~~Mechanical~~	~~100, 170, 240 (A)~~						~~**106**~~	~~*79*~~			~~**106**~~	~~*79*~~
~~JU4H-UFADJG-D~~	~~T3 Certified~~	~~Electronic~~	~~100 – 350 (B)~~		~~**109** [2]~~	~~*81* [2]~~	~~**120** [1,2]~~	~~*89* [1,2]~~	~~**123** [1,2]~~	~~*92* [1,2]~~	~~**123** [1,2]~~	~~*92* [1,2]~~		
~~JU4H-UFADJG-S~~	~~T3 Certified~~	~~Electronic~~		~~50 – 30 (C)~~	~~**109** [2]~~	~~*81* [2]~~	~~**120** [1,2]~~	~~*89* [1,2]~~	~~**123** [1,2]~~	~~*92* [1,2]~~	~~**123** [1,2]~~	~~*92* [1,2]~~		
~~JU4H-UFADJG-DS~~	~~T3 Certified~~	~~Electronic~~	~~100 – 350 (B)~~	~~50 – 30 (C)~~	~~**109** [2]~~	~~*81* [2]~~	~~**120** [1,2]~~	~~*89* [1,2]~~	~~**123** [1,2]~~	~~*92* [1,2]~~	~~**123** [1,2]~~	~~*92* [1,2]~~		
~~JU4H-UF50-P1~~	~~T1 Compliant~~	~~Mechanical~~	~~100, 170, 240 (A)~~		~~**110**~~	~~*82*~~	~~**130**~~	~~*97*~~	~~**127**~~	~~*95*~~				
~~JU4H-UF52-P1~~	~~T1 Compliant~~	~~Mechanical~~	~~100, 170, 240 (A)~~						~~**127**~~	~~*95*~~			~~**127**~~	~~*95*~~
~~JU6H-UF30-P1~~	~~T1 Compliant~~	~~Mechanical~~	~~100, 170, 240 (A)~~		~~**140**~~	~~*104*~~	~~**160**~~	~~*119*~~	~~**160**~~	~~*119*~~				
~~JU6H-UF32-P1~~	~~T1 Compliant~~	~~Mechanical~~	~~100, 170, 240 (A)~~						~~**160**~~	~~*119*~~			~~**160**~~	~~*119*~~
~~JU6H-UFADK0-D~~	~~T3 Certified~~	~~Electronic~~	~~100 – 350 (B)~~		~~**168** [2]~~	~~*125* [2]~~	~~**173** [1,2]~~	~~*129* [1,2]~~	~~**175** [1,2]~~	~~*131* [1,2]~~	~~**175** [1,2]~~	~~*131* [1,2]~~		
~~JU6H-UFADK0-S~~	~~T3 Certified~~	~~Electronic~~		~~50 – 30 (C)~~	~~**168** [2]~~	~~*125* [2]~~	~~**173** [1,2]~~	~~*129* [1,2]~~	~~**175** [1,2]~~	~~*131* [1,2]~~	~~**175** [1,2]~~	~~*131* [1,2]~~		
~~JU6H-UFADK0-DS~~	~~T3 Certified~~	~~Electronic~~	~~100 – 350 (B)~~	~~50 – 30 (C)~~	~~**168** [2]~~	~~*125* [2]~~	~~**173** [1,2]~~	~~*129* [1,2]~~	~~**175** [1,2]~~	~~*131* [1,2]~~	~~**175** [1,2]~~	~~*131* [1,2]~~		
~~JU6H-UF50-P1~~	~~T1 Compliant~~	~~Mechanical~~	~~100, 170, 240 (A)~~		~~**183**~~	~~*137*~~	~~**210**~~	~~*157*~~	~~**210**~~	~~*157*~~				
~~JU6H-UF52-P1~~	~~T1 Compliant~~	~~Mechanical~~	~~100, 170, 240 (A)~~						~~**210**~~	~~*157*~~			~~**210**~~	~~*157*~~
~~JU6H-UF60-P1~~	~~T1 Compliant~~	~~Mechanical~~	~~100, 170, 240 (A)~~		~~**200**~~	~~*149*~~	~~**240**~~	~~*179*~~	~~**240**~~	~~*179*~~				
~~JU6H-UF62-P1~~	~~T1 Compliant~~	~~Mechanical~~	~~100, 170, 240 (A)~~						~~**240**~~	~~*179*~~			~~**240**~~	~~*179*~~
~~JU6H-UFADP0-D~~	~~T3 Certified~~	~~Electronic~~	~~100 – 350 (B)~~		~~**220** [2]~~	~~*164* [2]~~	~~**209** [1,2]~~	~~*156* [1,2]~~	~~**211** [1,2]~~	~~*157* [1,2]~~	~~**211** [1,2]~~	~~*157* [1,2]~~		
~~JU6H-UFADP0-S~~	~~T3 Certified~~	~~Electronic~~		~~50 – 30 (C)~~	~~**220** [2]~~	~~*164* [2]~~	~~**209** [1,2]~~	~~*156* [1,2]~~	~~**211** [1,2]~~	~~*157* [1,2]~~	~~**211** [1,2]~~	~~*157* [1,2]~~		
~~JU6H-UFADP0-DS~~	~~T3 Certified~~	~~Electronic~~	~~100 – 350 (B)~~	~~50 – 30 (C)~~	~~**220** [2]~~	~~*164* [2]~~	~~**209** [1,2]~~	~~*156* [1,2]~~	~~**211** [1,2]~~	~~*157* [1,2]~~	~~**211** [1,2]~~	~~*157* [1,2]~~		
~~JU6H-UFADQ0-D~~	~~T3 Certified~~	~~Electronic~~	~~100 – 350 (B)~~				~~**224** [1,2]~~	~~*167* [1,2]~~	~~**226** [1,2]~~	~~*169* [1,2]~~	~~**226** [1,2]~~	~~*169* [1,2]~~		
~~JU6H-UFADQ0-S~~	~~T3 Certified~~	~~Electronic~~		~~50 – 30 (C)~~			~~**224** [1,2]~~	~~*167* [1,2]~~	~~**226** [1,2]~~	~~*169* [1,2]~~	~~**226** [1,2]~~	~~*169* [1,2]~~		
~~JU6H-UFADQ0-DS~~	~~T3 Certified~~	~~Electronic~~	~~100 – 350 (B)~~	~~50 – 30 (C)~~			~~**224** [1,2]~~	~~*167* [1,2]~~	~~**226** [1,2]~~	~~*169* [1,2]~~	~~**226** [1,2]~~	~~*169* [1,2]~~		
~~JU6H-UFADR0-D~~	~~T3 Certified~~	~~Electronic~~	~~100 – 350 (B)~~				~~**238** [1,2]~~	~~*177.5* [1,2]~~	~~**240** [1,2]~~	~~*179* [1,2]~~	~~**240** [1,2]~~	~~*179* [1,2]~~		
~~JU6H-UFADR0-S~~	~~T3 Certified~~	~~Electronic~~		~~50 – 30 (C)~~			~~**238** [1,2]~~	~~*177.5* [1,2]~~	~~**240** [1,2]~~	~~*179* [1,2]~~	~~**240** [1,2]~~	~~*179* [1,2]~~		
~~JU6H-UFADR0-DS~~	~~T3 Certified~~	~~Electronic~~	~~100 – 350 (B)~~	~~50 – 30 (C)~~			~~**238** [1,2]~~	~~*177.5* [1,2]~~	~~**240** [1,2]~~	~~*179* [1,2]~~	~~**240** [1,2]~~	~~*179* [1,2]~~		
~~JU6H-UFADT0-D~~	~~T3 Certified~~	~~Electronic~~	~~100 – 350 (B)~~		~~**229** [2]~~	~~*172* [2]~~	~~**274** [1,2]~~	~~*204* [1,2]~~	~~**275** [1,2]~~	~~*205* [1,2]~~	~~**275** [1,2]~~	~~*205* [1,2]~~		
~~JU6H-UFADT0-S~~	~~T3 Certified~~	~~Electronic~~		~~50 – 30 (C)~~	~~**229** [2]~~	~~*172* [2]~~	~~**274** [1,2]~~	~~*204* [1,2]~~	~~**275** [1,2]~~	~~*205* [1,2]~~	~~**275** [1,2]~~	~~*205* [1,2]~~		
~~JU6H-UFADT0-DS~~	~~T3 Certified~~	~~Electronic~~	~~100 – 350 (B)~~	~~50 – 30 (C)~~	~~**229** [2]~~	~~*172* [2]~~	~~**274** [1,2]~~	~~*204* [1,2]~~	~~**275** [1,2]~~	~~*205* [1,2]~~	~~**275** [1,2]~~	*205* [1,2]		
JW6H-UFADD0-D	T3 Certified	Electronic	100 - 350 (B)		**324** [2]	*242* [2]	**351** [1,2]	*262* [1,2]						
~~JW6H-UFADD0-S~~	~~T3 Certified~~	~~Electronic~~		~~50 – 30 (C)~~	~~**324** [2]~~	~~*242* [2]~~	~~**351** [1,2]~~	~~*262* [1,2]~~						
~~JW6H-UFADD0-DS~~	~~T3 Certified~~	~~Electronic~~	~~100 – 350 (B)~~	~~50 – 30 (C)~~	~~**324** [2]~~	~~*242* [2]~~	~~**351** [1,2]~~	~~*262* [1,2]~~						
~~JX6H-UFADK0-D~~	~~T3 Certified~~	~~Electronic~~	~~100 – 350 (B)~~		~~**517** [2]~~	~~*385.5* [2]~~	~~**526** [1,2]~~	~~*392* [1,2]~~						
~~JX6H-UFADK0-S~~	~~T3 Certified~~	~~Electronic~~		~~50 – 30 (C)~~	~~**517** [2]~~	~~*385.5* [2]~~	~~**526** [1,2]~~	~~*392* [1,2]~~						
~~JX6H-UFADK0-DS~~	~~T3 Certified~~	~~Electronic~~	~~100 – 350 (B)~~	~~50 – 30 (C)~~	~~**517** [2]~~	~~*385.5* [2]~~	~~**526** [1,2]~~	~~*392* [1,2]~~						

Engine Models highlighted in Green are suitable for installations in the US and US territories
● Applies to John Deere model year per Table 4 to Subpart IIII of 40 CFR Part 60
♦ All Models available for Export
▼ Applies to models less than 100 HP
▲ Applies to models greater than 99 HP

[1] Available for installations inside the USA
[2] Available for installations outside the USA

TABLE 1

A. Discharge Set Point Pressure/Maximum Control Pressure is 100/110, 170/175, or 240/250 psi, Factory Set and not field adjustable. Specify Set Point & Maximum Control Pressure at time of order.

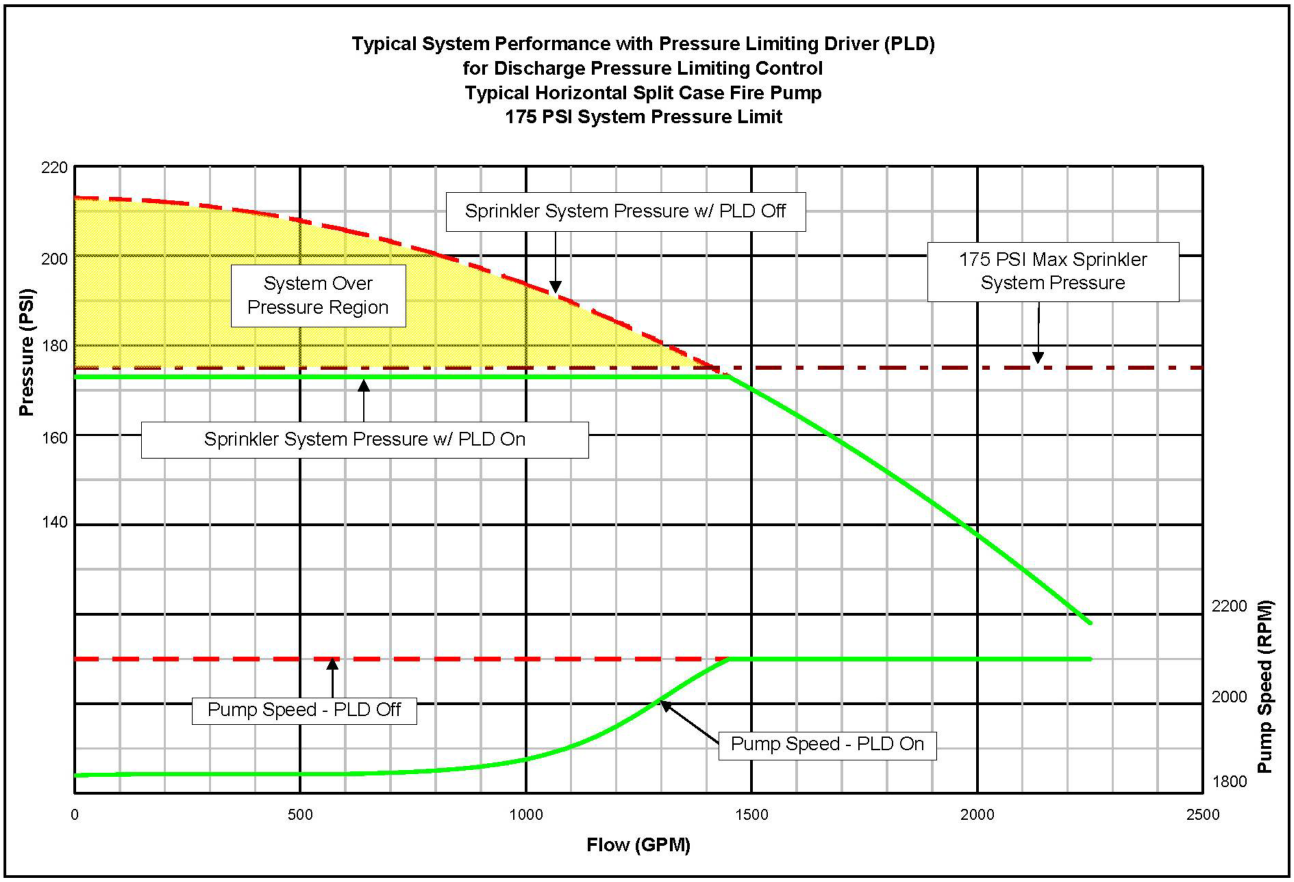
B. Discharge Set Point and Maximum Control Pressure can be Factory Set at any value within this range and is not field adjustable. Specify Maximum Control Pressure value at time of order.

C. Suction Pressure Limiting Control Set Point can be Factory Set at any value within this range. Set Point is not field adjustable. Specify Control Pressure Set Point at time of order.

-D = Discharge Control, -S = Suction Control,
-DS = Both Suction & Discharge Control

PRESSURE LIMITING DRIVERS

SERIES
JU4H JW6H
JU6H JX6H



GRAPH 1

PRESSURE LIMITING DRIVER
SUMMARY - FOR DISCHARGE PRESSURE CONTROL

- The Clarke PLD for Discharge Pressure Limiting Control is a UL/FM certified diesel engine fire pump driver which reduces pump speed to limit the maximum pump discharge pressure to prevent over-pressurization of the sprinkler system. See Graph 1
- Certain Clarke PLD Equipped engines (-P1 Models) are available with one of three different factory settings: 100 psi (maximum pressure held between 100-110 psi), 170 psi (maximum pressure held between 170-175 psi) and 240 psi (maximum pressure held between 240-250 psi). Refer to Table 1 for Discharge Pressure Limiting Control values.
- Certain Clarke PLD equipped engines (-D ~~and -DS Models)~~ can be Factory Set at any specific pressure between 100 psi and 350 psi. The value must be factory set and is not field adjustable, refer to Table 1.
- The Clarke PLD senses sprinkler system water pressure via a sensing line connected to the pump discharge pipe (between the pump flange and the discharge pressure, see Graph 1. NOTE: -P1 models require a drainline, -D and ~~-DS~~ models do not.
- A Clarke PLD requires a controller equipped with visible and audible alarms to comply with NFPA 20 Per 12.4.1.3 (8).
- When using a Clarke PLD for Discharge Pressure Limiting Control, NFPA 20 requires the installation of a pressure relief valve.
- During commissioning, the PLD device is turned off in order to verify the performance of the pump to the factory test curve. Therefore fittings and pipe with the appropriate higher pressure rating need to be used from the pump discharge flange to and including the gate or butterfly discharge isolating valve.

CLARKE PLD

PRESSURE LIMITING DRIVERS

SERIES
JU4H JW6H
JU6H JX6H

DISCHARGE PRESSURE LIMITING CONTROL

- ~~-P1 Models: 100/110, 170/175, 240/250 psi Factory Set Point/Maximum Pressure (not field adjustable)~~
- -D Models: 100/350 psi Factory Set Point (not field adjustable)

FEATURES

- Controls System Over-Pressure while meeting NFPA 20.
- Controls System Over-Pressure without any device in the main supply line, where a failure condition of a device in the main supply line could interrupt the water supply.
- Reduces the quantity of the pressure reducing valves on high rise applications by limiting the amount of floors exceeding the maximum pressure of the sprinkler system.
- Enables the use of pumps with steeper rise to shut off pressure curves. Steeper pump curves typically require less horsepower which can reduce the total cost of fire protection.
- Eliminates the discharge of water from the pressure relief valve during the weekly pump test.
- No valve in-line with discharge.
- Allows smaller pipe diameter.

NFPA 20 (2016) LANGUAGE FOR USE AND ACCEPTABILITY OF VARIABLE SPEED PRESSURE LIMITING CONTROL

3.3.68 Variable Speed Pressure Limiting Control. A speed control system used to limit the total discharge pressure by reducing the pump driver speed from rated speed.

4.7.7.3.1 Variable speed pressure limiting control drivers, as defined in this standard, shall be acceptable to limit system pressure.

4.7.7.2 Pressure relief valves and pressure regulating devices in the fire pump installation shall not be used as a means to meet the requirements of 4.7.7.1.

4.7.7.3.2 The set pressure plus the maximum pressure variance of the variable speed pressure limiting controlled systems during variable speed operation and adjusted for elevation shall not exceed the pressure rating of any system component.

4.19.1.2 Where a diesel engine fire pump is installed and where a total of 121 percent of the net rated shutoff (churn) pressure plus the maximum static suction pressure, adjusted for elevation, exceeds the pressure for which the system components are rated, a pressure relief valve shall be installed.

Each engine has a minimum operating speed. In order to determine if the Clarke PLD engine can reduce enough pressure for an installation, each job needs to be reviewed using the “PLD Calculator”, found on our website, **www.clarkefire.com**. A copy of the PLD Calculator results or the PLD Log Number must be submitted with any purchase order.

MODEL NOMENCLATURE (8 Digit Models)

JU6H-UF30-P1

- Base Engine
- 350 Series
- 6 Cylinder
- Heat Exchanger Cooled
- UL Listed and FM Approved
- Power Curve Number
- PLD Discharge Pressure Control

MODEL NOMENCLATURE (10 Digit Models)

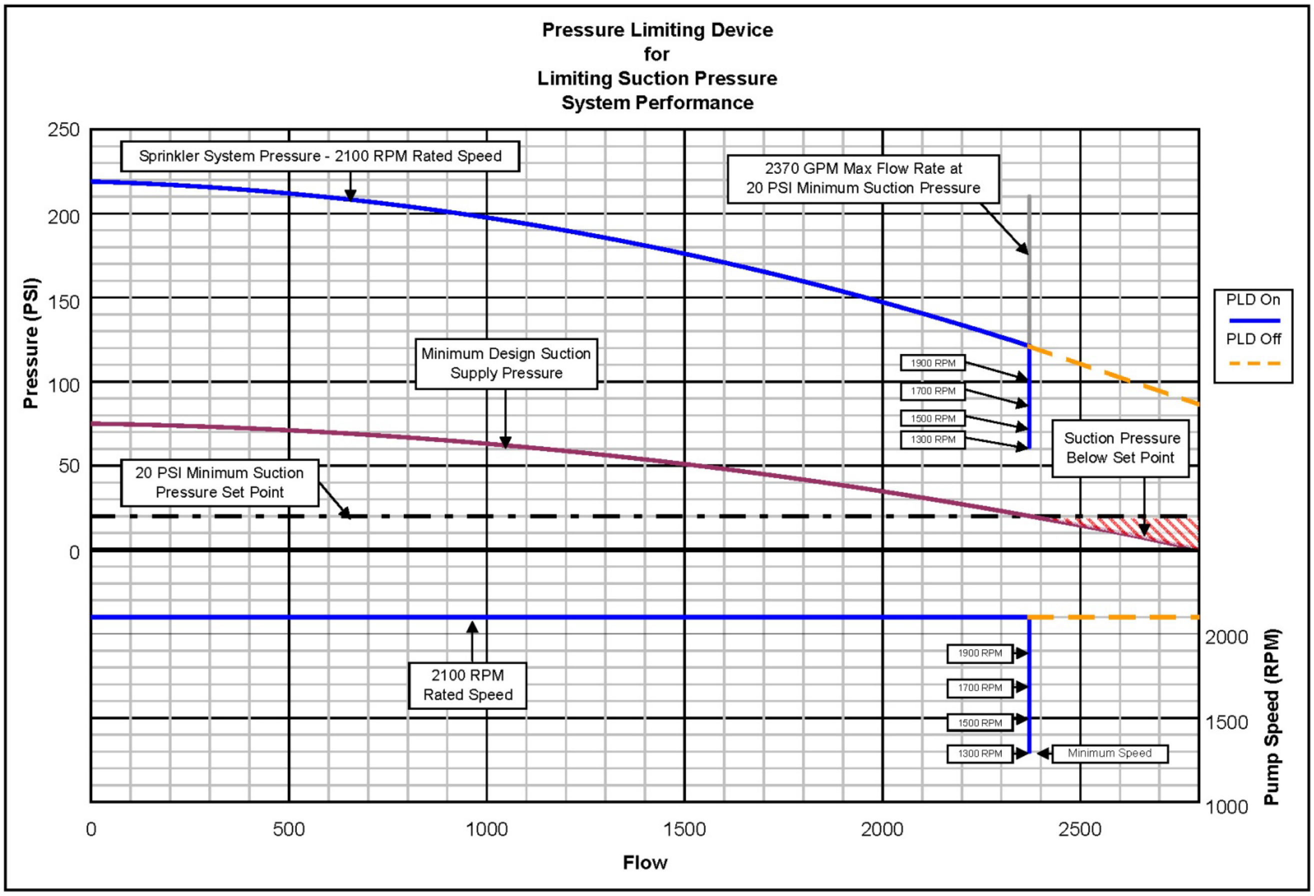
JX6H-UFADK0-D

- Base Engine
- 650 Series
- 6 Cylinder
- Heat Exchanger Cooled
- UL Listed and FM Approved
- Built in USA
- EPA Tier 3 Certified
- Power Curve Number
- PLD Discharge Pressure Control

MODEL NOMENCLATURE (10 Digit Models)

JX6H-UFADK0-DS

- Base Engine
- 350 Series
- 6 Cylinder
- Heat Exchanger Cooled
- UL Listed and FM Approved
- Built in USA
- EPA Tier 3 Certified
- Power Curve Number
- PLD Discharge and Suction Pressure Control



GRAPH 1

PRESSURE LIMITING DRIVER CLARKE PLD
SUMMARY - FOR SUCTION PRESSURE CONTROL

- The Clarke PLD-S for Suction Pressure Limiting Control is a UL/FM certified diesel engine fire pump driver which reduces engine speed to maintain a minimum positive suction pressure value to prevent under-pressurization of the sprinkler water supply. See Graph 1
- The Clarke PLD-S can be factory set at any specific minimum suction pressure between 5 psi and 30 psi. Note this set point is not field adjustable.
- The Clarke PLD-S senses the fire pump suction pressure via a sensing line connected to the pump supply pipe (between the pump flange and the suction isolating valve), and reduces engine speed to manage suction pressure, see Graph 2.

PRESSURE LIMITING DRIVERS

SERIES
JU4H JW6H
JU6H JX6H

SUCTION PRESSURE CONTROL

- -S Models: 5-30 psi Factory Set Point (not field adjustable)

FEATURES

- Controls minimum suction pressure while meeting NFPA 20
- Maintains minimum suction pressure by reducing engine speed.
- Typically will not shut off pump during operation.
- No valve in-line with supply water.
- Can substitute for break tank.
- If minimum suction pressure cannot be maintained, engine will signal controller.
- Designed to protect water supply when number of open sprinkler heads exceeds design criteria.
- Eliminates the need for a suction control valve (verify usage with authority having jurisdiction).

NFPA 20 (2016) LANGUAGE FOR USE AND ACCEPTABILITY OF VARIABLE SPEED PRESSURE LIMITING CONTROL

3.3.69 Variable Speed Suction Limiting Control. A speed control system used to maintain a minimum positive suction pressure at the pump inlet by reducing the pump driver speed while monitoring pressure in the suction piping through a sensing line.

11.2.4.3.1 Variable speed pressure limiting control or variable speed suction limiting control systems used on diesel engines for fire pump drive shall be listed for fire pump service and be capable of limiting the pump output total rated head (pressure) or suction pressure by reducing pump speed.

11.2.4.3.2 Variable speed control systems shall not replace the engine governor as defined in 11.2.4.1.

11.2.4.3.3 In the event of a failure of the variable speed control system, the engine shall operate at pump-rated speed with the governor defined in 11.2.4.1.

11.2.4.3.4.4 For suction limiting control, a sensing line shall be installed from a connection at the pump inlet flange to the engine.

11.2.4.3.5 Within 20 seconds after a demand to start, pump shall supply and maintain a stable discharge press (± 10 percent) throuighout the entire range of operation.

Each engine has a minimum operating speed. In order to determine if the Clarke PLD-S engine can reduce enough pressure for an installation, each job needs to be reviewed using the "SPLD Calculator", found on our website, **www.clarkefire.com**. A copy of the SPLD Calculator results or the SPLD Log Number must be submitted with any purchase order.

MODEL NOMENCLATURE (10 Digit Models)

JX6H-UFADK0-S

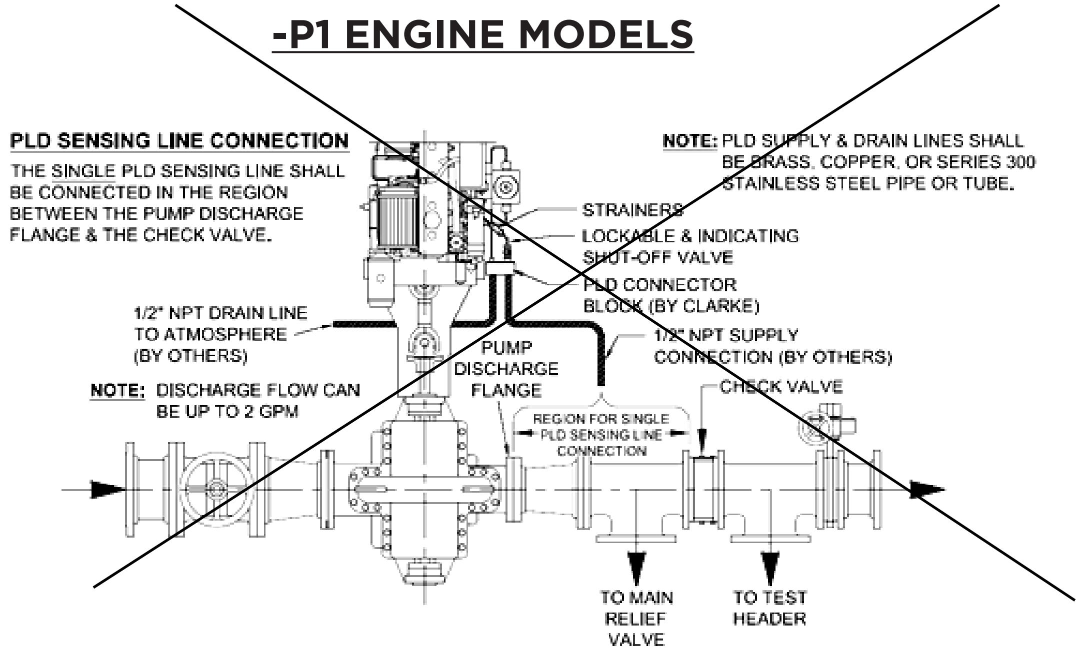
- Base Engine
- 650 Series
- 6 Cylinder
- Heat Exchanger Cooled
- PLD Suction Pressure Control
- Power Curve Number
- EPA Tier 3 Certified
- Built in USA
- UL Listed and FM Approved

MODEL NOMENCLATURE (10 Digit Models)

JX6H-UFADK0-DS

- Base Engine
- 350 Series
- 6 Cylinder
- Heat Exchanger Cooled
- PLD Discharge and Suction Pressure Control
- Power Curve Number
- EPA Tier 3 Certified
- Built in USA
- UL Listed and FM Approved

-P1 ENGINE MODELS



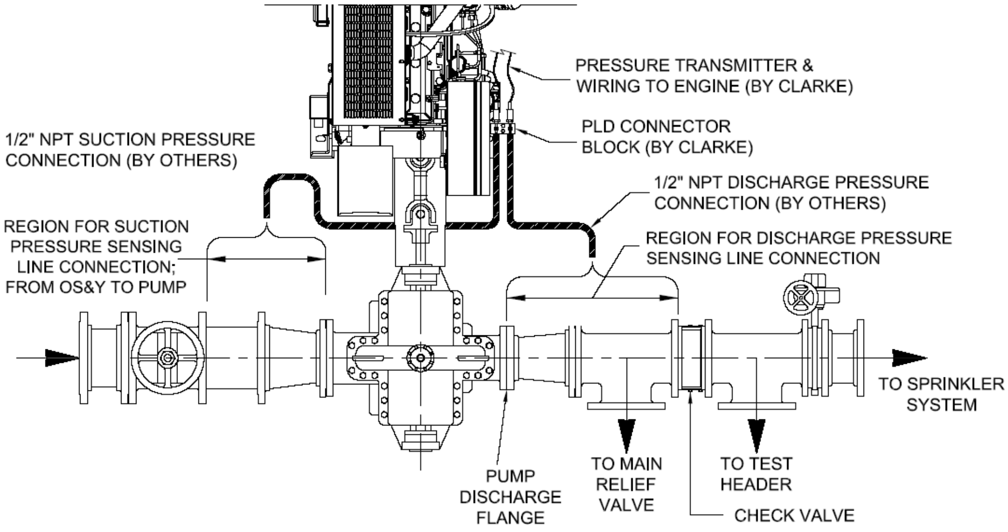
-D ~~-S AND -DS~~ ENGINE MODELS

SUCTION PRESSURE LIMITING CONTROL SENSING LINE CONNECTION

THE SINGLE SUCTION PRESSURE LIMITING CONTROL SENSING LINE SHALL BE CONNECTED IN THE IMMEDIATE REGION UPSTREAM OF THE PUMP INLET.

DISCHARGE PRESSURE LIMITING CONTROL SENSING LINE CONNECTION

THE SINGLE DISCHARGE PRESSURE CONTROL SENSING LINE SHALL BE CONNECTED IN THE REGION BETWEEN THE PUMP DISCHARGE FLANGE & THE CHECK VALVE.



Specifications and information contained in this brochure are subject to change without notice.

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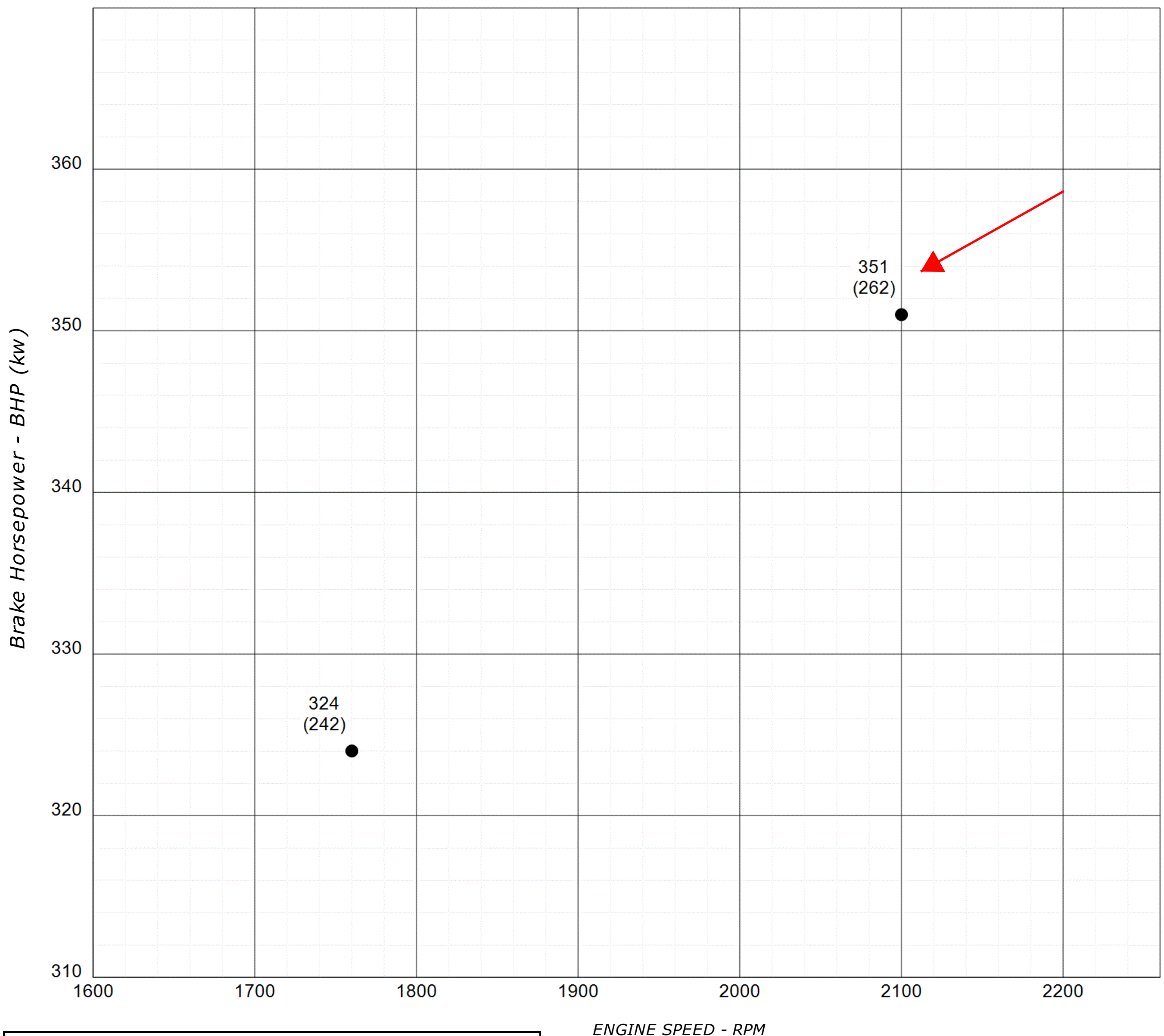
CLARKE®

FIRE PUMP MODEL: JW6H-UFADD0
Heat Exchanger Cooled
Raw Water Charge Cooling
Tier 3 Emissions Certified



RESTRICTED:
Use only for Stand-By Fire Pump Applications

●——● *NAMEPLATE BHP (MAXIMUM PUMP LOAD)*

ENGINE PERFORMANCE:
STANDARD CONDITIONS: (SAE J1349, ISO 3046)
77°F (25°C) AIR INLET TEMPERATURE
29.61 IN. (751.1MM) HG BAROMETRIC PRESSURE
#2 DIESEL FUEL (SEE C13940)

Kevin Kunkler 18AUG08

CREATED	DATE CREATED
KJK	08/14/08

ENGINE MODEL JW6H-UFADD0

DRAWING NO.	REV
C132685	A

CLARKE®

JW6H-UFADD0
INSTALLATION & OPERATION DATA (I&O)
USA Produced

Basic Engine Description

Engine Manufacturer	John Deere Co.
Ignition Type	Compression (Diesel)
Number of Cylinders	6
Bore and Stroke - in (mm)	4.66 (118) X 5.35 (136)
Displacement - in³ (L)	549 (9)
Compression Ratio	16.0:1
Valves per cylinder	
Intake	2
Exhaust	2
Combustion System	Direct Injection
Engine Type	In-Line, 4 Stroke Cycle
Fuel Management Control	Electronic, High Pressure Common Rail
Firing Order (CW Rotation)	1-5-3-6-2-4
Aspiration	Turbocharged
Charge Air Cooling Type	Raw Water Cooled
Rotation, viewed from front of engine, Clockwise (CW)	Standard
Engine Crankcase Vent System	Open
Installation Drawing	D716
Weight - lb (kg)	2094 (950)

Power Rating	1760	2100
Nameplate Power - HP (kW) ¹	324 (242)	351 (262)

Cooling System - [C051387]	1760	2100
Engine Coolant Heat - Btu/sec (kW)	325 (343)	287 (303)
Engine Radiated Heat - Btu/sec (kW)	21.8 (23)	23.7 (25)
Heat Exchanger Minimum Flow		
60°F (15°C) Raw H_2O - gal/min (L/min)	27 (102)	30 (114)
100°F (37°C) Raw H_2O - gal/min (L/min)	41 (155)	45 (170)

Customer responsible for keeping room temperature below 117 degrees

Heat Exchanger Maximum Cooling Raw Water	
Inlet Pressure - psi (bar)	60 (4.1)
Flow - gal/min (L/min)	80 (303)
Typical Engine H_2O Operating Temp - °F (°C)	180 (82.2) - 195 (90.6)
Thermostat	
Start to Open - °F (°C)	180 (82.2)
Fully Opened - °F (°C)	201 (93.9)
Engine Coolant Capacity - qt (L)	25.9 (24.5)
Coolant Pressure Cap - lb/in² (kPa)	15 (103)
Maximum Engine Coolant Temperature - °F (°C)	221 (105)
Minimum Engine Coolant Temperature - °F (°C)	160 (71.1)
High Coolant Temp Alarm Switch - °F (°C)	235 (113) - 241 (116)

Electric System - DC	Standard		Optional	
System Voltage (Nominal)	12		24	
Battery Capacity for Ambients Above 32°F (0°C)				
Voltage (Nominal)	12	{C07633}	12	{C07633}
Qty. Per Battery Bank	1		2	
SAE size per J537	8D		8D	
CCA @ 0°F (-18°C) per J537	1400		1400	
Reserve Capacity - Minutes per J537	430		430	
Battery Cable Circuit, Max Resistance - ohm	0.0017		0.0017	
Battery Cable Minimum Size				
0-120 in. Circuit Length ²	00		00	
121-160 in. Circuit Length ²	000		000	
161-200 in. Circuit Length ²	0000		0000	
Charging Alternator Maximum Output - Amp,	40	{C071363}	55	{C071365}
Starter Cranking Amps, Rolling - @60°F (15°C)	440	{RE520634}	326	{C07820}

* All footnotes are at the bottom of Page 2

CLARKE®

JW6H-UFADD0
INSTALLATION & OPERATION DATA (I&O)
USA Produced

see exhaust sizing program at clarkfire.com for proper exhaust sizing.

Exhaust System (Single Exhaust Outlet)	**1760**	**2100**
Exhaust Flow - ft.³/min (m³/min)	1622 (45.9)	1878 (53.2)
Exhaust Temperature - °F (°C)	745 (396)	816 (436)
Maximum Allowable Back Pressure - in H_2O (kPa)	16 (4)	16 (4)
Minimum Exhaust Pipe Dia. - in (mm) ³	6 (152)	6 (152)

Fuel System	**1760**	**2100**
Fuel Consumption - gal/hr (L/hr)	16.2 (61.3)	19 (71.9)
Fuel Return - gal/hr (L/hr)	48.8 (185)	46 (174)
Fuel Supply - gal/hr (L/hr)	65.0 (246)	65.0 (246)
Fuel Pressure - lb/in² (kPa)	16.2 (112) - 19 (131)	
Minimum Line Size - Supply - in.	.75 Schedule 40 Steel Pipe	
Pipe Outer Diameter - in (mm)	0.848 (21.5)	
Minimum Line Size - Return - in.	.375 Schedule 40 Steel Pipe	
Pipe Outer Diameter - in (mm)	0.675 (17.1)	
Maximum Allowable Fuel Pump Suction Lift with clean Filter - in H_2O (mH_2O)	80 (2)	
Maximum Allowable Fuel Head above Fuel pump, Supply or Return - ft (m)	6.6 (2)	
Fuel Filter Micron Size	2 (Secondary)	

Customer responsible for assuring proper combustible air is available

Heater System	**Standard**
Engine Coolant Heater	
Wattage (Nominal)	2500
Voltage - AC, 1 Phase	230 (+5%, -10%)
Part Number	{C122195}

Air System	**1760**	**2100**	
Combustion Air Flow - ft.³/min (m³/min)	744 (21.1)	825 (23.4)	
Air Cleaner	**Standard**		**Optional**
Part Number	{C03244}		{C03330}
Type	Indoor Service Only, with Shield		Canister, Single-Stage
Cleaning method	Washable		Disposable
Air Intake Restriction Maximum Limit			
Dirty Air Cleaner - in H_2O (kPa)	14 (3.5)		14 (3.5)
Clean Air Cleaner - in H_2O (kPa)	7 (1.7)		7 (1.7)
Maximum Allowable Temperature (Air To Engine Inlet) - °F (°C)	130 (54.4)		

Lubrication System	
Oil Pressure - normal - lb/in² (kPa)	37 (255) - 41 (283)
Low Oil Pressure Alarm Switch - lb/in² (kPa) to	21 (145) - 41 (283)
In Pan Oil Temperature - °F (°C)	190 (87.8) - 220 (104)
Total Oil Capacity with Filter - qt (L)	30.1 (28.5)

Lube Oil Heater	**Optional**
Wattage (Nominal)	150
Voltage	240V (+5%, -10%)
Part Number	{C04431}

Performance	**1760**	**2100**
BMEP - lb/in² (kPa)	266 (1830)	241 (1660)
Piston Speed - ft/min (m/min)	1569 (478)	1873 (571)
Mechanical Noise - dB(A) @ 1m	C133382	
Power Curve	C132685	

NOTE: This engine is intended for indoor installation or in a weatherproof enclosure. ¹ Derate 3% per every 1000 ft. 304.8m above 300 ft. 91.4m and derate 1% for every 10°F 5.55 °C above 77°F 25°C. ² Positive and Negative Cables Combined Length. ³ Minimum Exhaust Pipe Diameter is based on: 15 feet of pipe, one 90° elbow, and one Industrial silencer. A Back-pressure flow analysis must be performed on the actual field installed exhaust system to assure engine maximum allowable back pressure is not exceeded. See Exhaust Sizing Calculator on www.clarkefire.com. { } indicates component reference part number.

CLARKE®

Rating Specific Emissions Data

Nameplate Rating Information

Clarke Model	**JW6H-UFADD0**
Power Rating (BHP/kW)	**351/262**
Certified Speed (RPM)	**2100**

Refer to **Rating Data** section on page 2 for emissions output values

Rating Specific Emissions Data - John Deere Power Systems

JOHN DEERE

Rating Data

Rating	6090HFC48	
Certified Power(kW)	298	
Rated Speed	2200	
Vehicle Model Number	OEM (Clarke Fire Pump-Emergency)	
Units	g/kW-hr	g/hp-hr
NOx	3.63	2.71
HC	0.10	0.07
NOx + HC	N/A	N/A
Pm	0.10	0.07
CO	0.6	0.4

Certificate Data

Engine Model Year	2020
EPA Family Name	LJDXL13.5103
EPA JD Name	650HAA
EPA Certificate Number	LJDXL13.5103-011
CARB Executive Order	
Parent of Family	6135HF485A
Units	g/kW-hr
NOx	3.31
HC	0.11
NOx + HC	N/A
Pm	0.10
CO	0.6

* The emission data listed is measured from a laboratory test engine according to the test procedures of 40 CFR 89 or 40 CFR 1039, as applicable. The test engine is intended to represent nominal production hardware, and we do not guarantee that every production engine will have identical test results. The family parent data represents multiple ratings and this data may have been collected at a different engine speed and load. Emission results may vary due to engine manufacturing tolerances, engine operating conditions, fuels used, or other conditions beyond our control.

Emissions Results by Rating run on Jan-13-2020

DATUMS:

-A- - MOUNTING FACE OF FLYWHEEL

-B- - ENGINE CRANKSHAFT HORIZONTAL CENTERLINE

-C- - ENGINE CRANKSHAFT VERTICAL CENTERLINE

- CENTER OF GRAVITY OF ENGINE

- CLOCKWISE ROTATION WHEN VIEWED FROM FRONT OF ENGINE

CAUTION:

ALL PLUMBING MUST BE SUPPORTED AND/OR ISOLATED SO THAT NO WEIGHT OR STRESS IS APPLIED TO ANY ENGINE COMPONENT

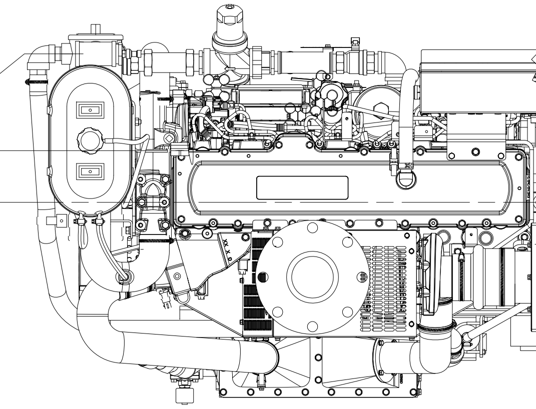
ATTENTION

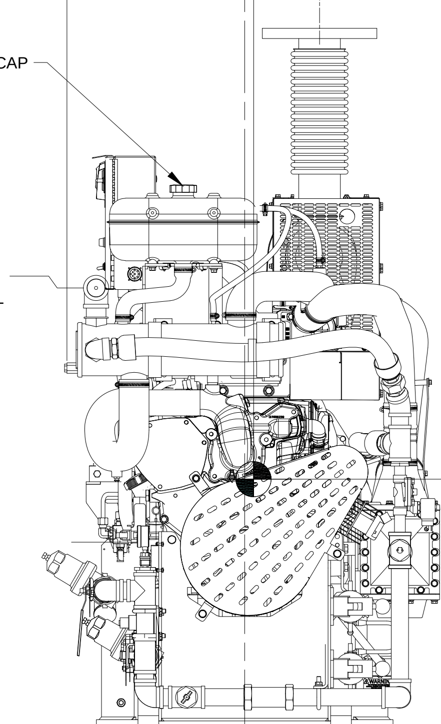
REFER TO THE SPECIFIC MODEL "INSTALLATION AND OPERATION DATA" FOR INSTALLATION GUIDELINES

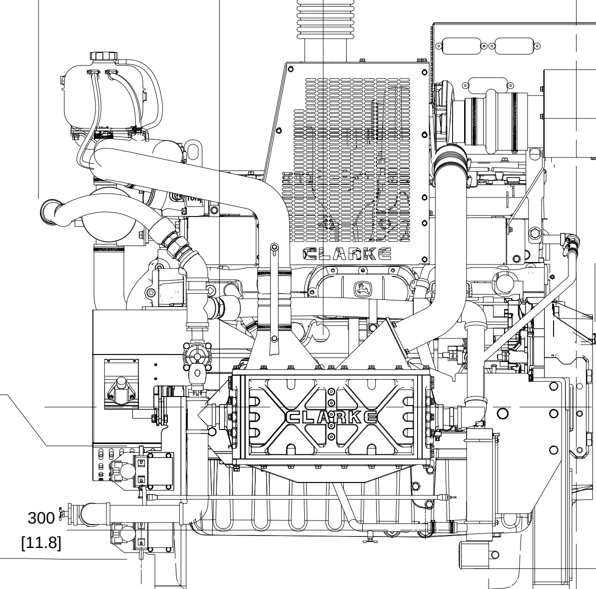
"TRWA" (TURBOCHARGED w/ RAW WATER AFTERCOOLING) MODELS	JW6H-UFADD0

VIEW FROM TOP OF ENGINE

DO NOT SCALE







DRAWING SUBJECT TO CHANGE WITHOUT NOTICE

REV	DESCRIPTION	ECN#	DWN	APVD	DATE
D	UPDATED FOOT GEOMETRY SEE PG. 2	4275	KFB		20OCT15
E	UPDATED TO SHOW INDICATING PLATES	4359	KFB		10DEC15
F	ADDED DIMS TO ENGINE LIFTING BRACKETS	5061	MDM		27JUN17
G	ADDED GLAND PLATE DETAIL, REMOVED 115 VAC OPTION	5236/5145	ECK		29NOV17
H	UPDATED TOLERANCE, LOGO, & DIMENSION PRECISION	5393	NMM		15MAY18
J	EXHAUST HEIGHT DIMENSION WAS 51.1"	5650	SAN	NMM	06FEB19

GENERAL TOLERANCES
UNLESS OTHERWISE SPECIFIED, ALL DIMENSIONS ARE IN MILLIMETERS [INCHES] AND MAY VARY ± 9.5 [0.38]

YES NO CONTROLLED DRAWING

CLARKE®

DRWN	DPOTTKOTTER
DATE	06OCT14
ENGR	ACRISTOFARO
MATERIAL	
ASSEMBLY	

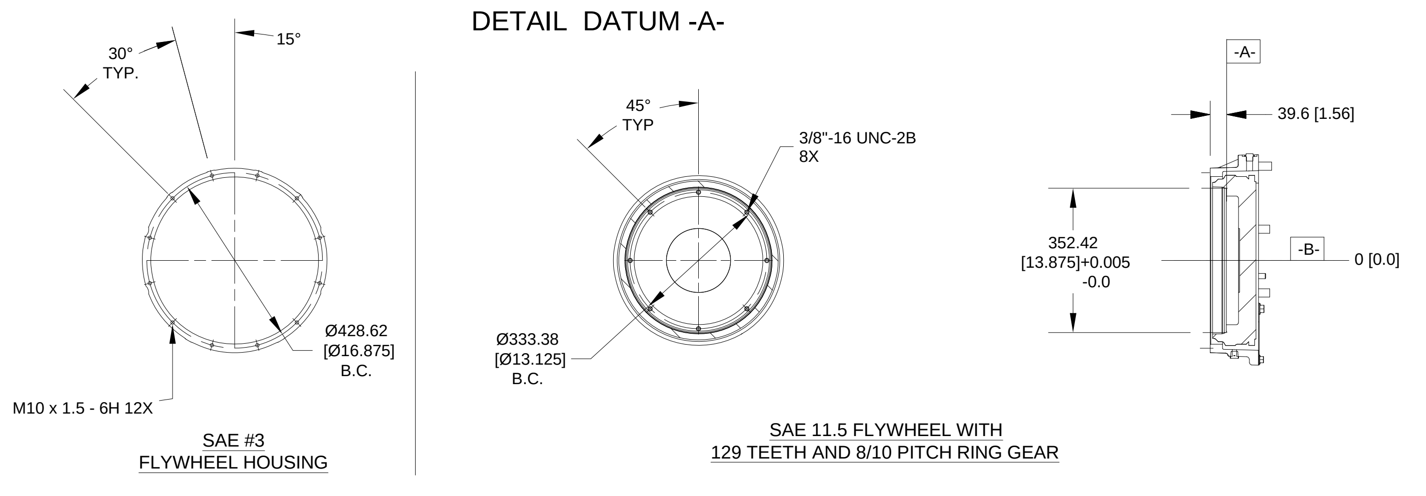
NAME: INSTALLATION DRAWING, FIRE PUMP ENGINE JW6H TIER 3 PLD MODEL

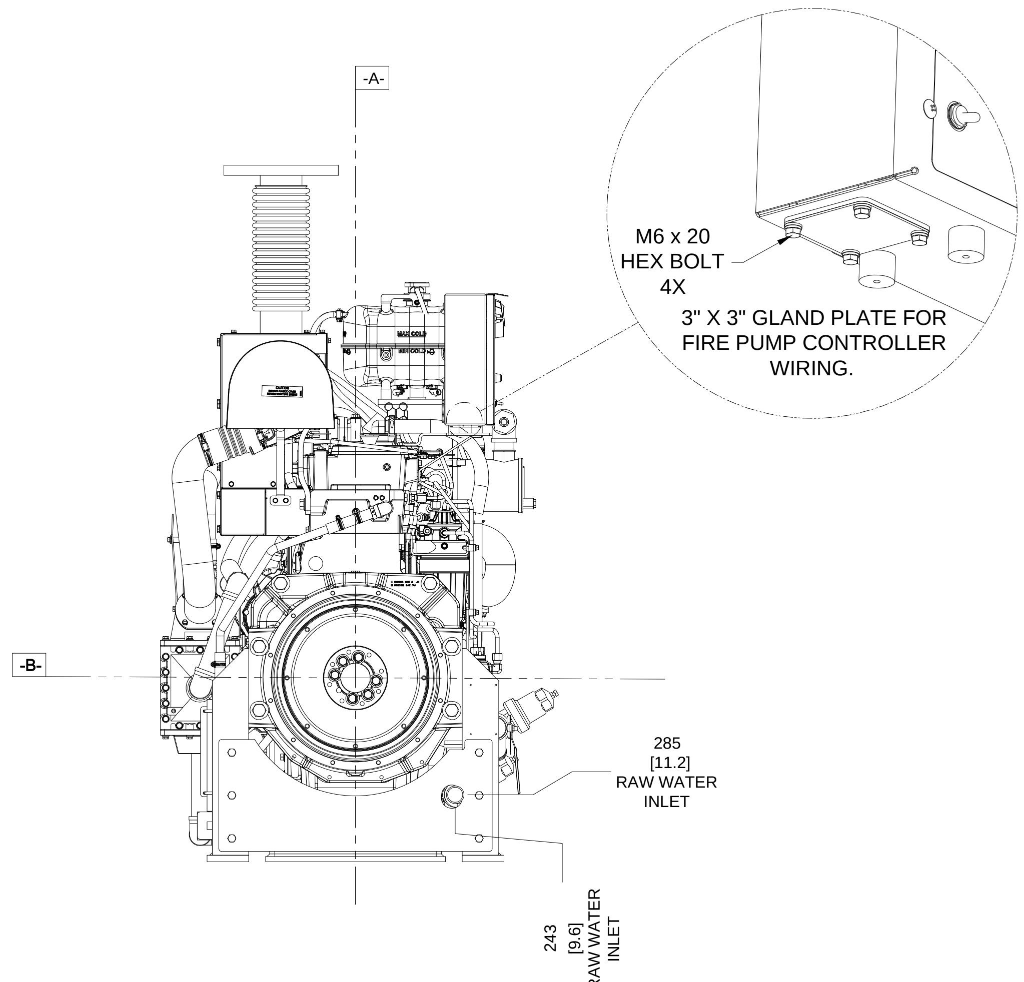
PART NO. D716 REV J

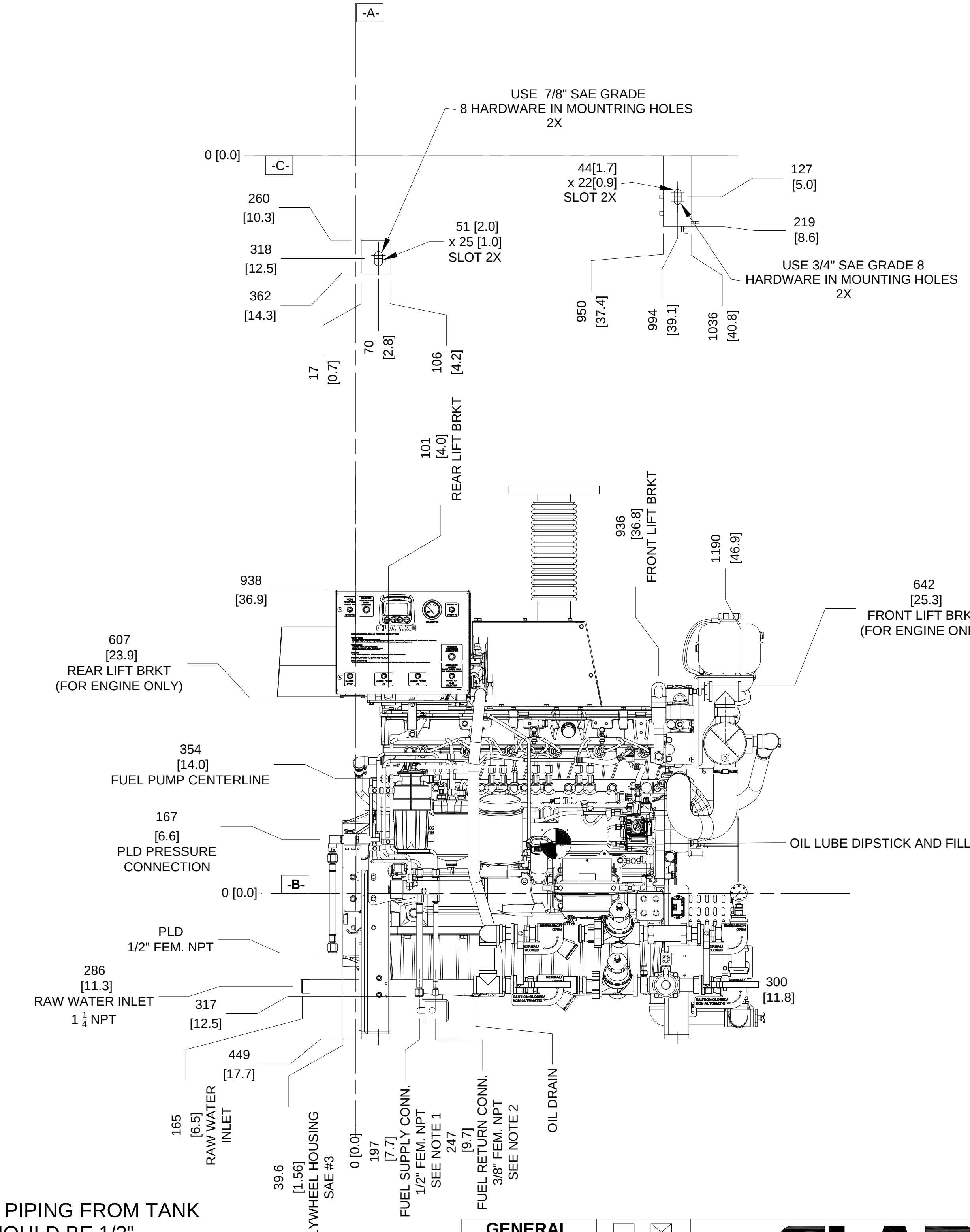
SCALE NTS UNITS MM [INCH] PAGE 1 OF 2

DO NOT SCALE

DETAIL DATUM -A-







FOR ENGINE SPECIFIC OPTIONS
SEE www.CLARKEFIRE.com

NOTES:
1. FUEL SUPPLY PIPING FROM TANK TO ENGINE SHOULD BE 1/2" MINIMUM PIPE DIAMETER.
2. FUEL RETURN PIPING FROM ENGINE TO TANK SHOULD BE 3/8" MINIMUM PIPE DIAMETER.

DRAWING SUBJECT
TO CHANGE
WITHOUT NOTICE

GENERAL TOLERANCES UNLESS OTHERWISE SPECIFIED, ALL DIMENSIONS ARE IN MILLIMETERS [INCHES] AND MAY VARY ± 9.5 [0.38]	YES / NO — CONTROLLED DRAWING	CLARKE®
	DRWN: DPOTTKOTTER	NAME: INSTALLATION DRAWING, FIRE PUMP ENGINE JW6H TIER 3 PLD MODEL
	DATE: 06OCT14	
THIS DRAWING AND THE INFORMATION HEREON ARE OUR PROPERTY AND MAY BE USED BY OTHERS ONLY AS AUTHORIZED BY US. UNPUBLISHED--ALL RIGHTS RESERVED UNDER THE COPYRIGHT LAWS.	ENGR: ACRISTOFARO	PART NO.: D716 — REV: J
	MATERIAL	
	ASSEMBLY	SCALE: NTS — UNITS: MM [INCH] — PAGE 2 OF 2

JW6H-UFADD0

FIRE PUMP DRIVER

NOISE DATA

Mechanical Engine Noise *

RPM	BHP	OVERALL dB(A)	Octave Band 31.5 Hz dB(A)	63 Hz dB(A)	125 Hz dB(A)	250 Hz dB(A)	500 Hz dB(A)	1k Hz dB(A)	2k Hz dB(A)	4k Hz dB(A)	8k Hz dB(A)	16k Hz dB(A)
~~1760~~	~~324~~	~~109.20~~	~~67.00~~	~~69.20~~	~~82.60~~	~~89.20~~	~~97.10~~	~~99.70~~	~~104.90~~	~~103.40~~	~~101.70~~	~~101.70~~
2100	351	109.10	65.40	68.00	78.50	89.90	96.60	99.90	104.50	101.10	97.70	97.30

Raw Exhaust Engine Noise **

RPM	BHP	OVERALL dB(A)	Octave Band 31.5 Hz dB(A)	63 Hz dB(A)	125 Hz dB(A)	250 Hz dB(A)	500 Hz dB(A)	1k Hz dB(A)	2k Hz dB(A)	4k Hz dB(A)	8k Hz dB(A)	16k Hz dB(A)
1760 - 2100	324 - 351	114.20	0.00	103.90	108.30	103.00	105.20	104.80	107.50	104.70	94.40	88.00

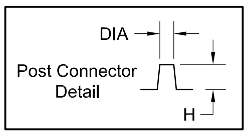
** Values above are provided at 3.3ft (1m) from engine block and do not include the raw exhaust noise.*

*** Values above are provided at 23ft (7m), 90° horizontal, from a vertical exhaust outlet and does not include noise created mechanically by the engine.*

The above data reflects nominal values for a typical engine of this model, speed and power in a free-field environment, tested at a no-load condition.

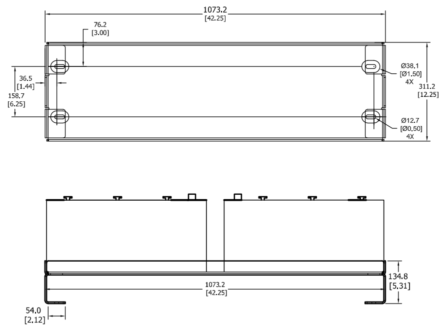
Installation specifics such as background noise level and amplification of noise levels from reflecting off of surrounding objects, will affect the overall noise levels observed. As a result of this, Clarke makes no guarantees to the above levels in an actual installation.

Clarke Battery P/N	Battery Model #	SAE # per J537	Engine Model Reference	Volts	Overall Dimensions	Weight lb (kg)		Performance Level			
					L x W x H in(mm)	Wet	Dry	Cold Cranking Amps @ 0 F (CCA) (3A)	Cranking Amps @ 32 F (CA)	Reserve Capacity (Minutes) (3B)	Rating @ 80 F (Amp Hours) (3C)
C07633	908D - Dry	8D-900	All KA4H, CJ4H, JU4H, JU4R, JU6H, JW6H, ZF6H, ZE4H	12V	20.75 x 11.0 x 10.0 (527 x 279 x 254)	130 (59.1)	80 (36.4)	1400	1720	430	185
			ALL JX6H, DP, DQ, DR, DS, & DT	24V							



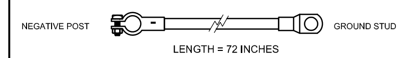
Post Connector Dimensions in(mm)			
POSITIVE		NEGATIVE	
DIA	H	DIA	H
3/4" (19.1 mm)	3/4" (19.1 mm)	5/8" (15.9 mm)	3/4" (19.1 mm)

BATTERY RACK
ITEM # 2
CLARKE P/N:C072584

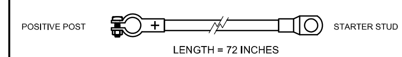


12 V & 24 V BATTERY CABLE SPECIFICATIONS					
Item	Clarke P/N	Size AWG (mm^2)	Terminal 1 Type	Terminal 2 Type	Terminal 2 Φ
3	C071171	$\frac{2}{0}$ (70)	Negative Post	Ring	$\frac{1}{2}$" (12 mm)
4	C071172	$\frac{2}{0}$ (70)	Positive Post	Ring	$\frac{1}{2}$" (12 mm)
5	C07631	$\frac{2}{0}$ (70)	Positive Post	Negative Post	

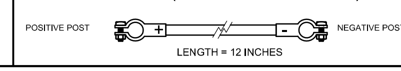
ITEM # 3 (CLARKE P/N: C071171)



ITEM # 4 (CLARKE P/N: C071172)



ITEM # 5 (CLARKE P/N: C07631)



Notes:

1. Batteries equipped with handles and lifting ledges.
2. Batteries are manufactured in black polypropylene case and cover.
3. Meets SAE storage battery requirements for SAE J537 JUN92.
   3A.While discharging specified amps, the battery voltage across the terminals after 30 seconds is 1.2 volts/cell or greater.
   3B. Time (minutes) to discharge battery at 25 amps when voltage across the battery terminals have fallen to 1.75 volts/cell.
   3C. Amp Hours = (reserve (minutes) x 25 amps)/60 min/hr
4. Battery should set into battery rack on $\frac{1}{2}$" plywood (or equal) to provide insulation and support.
5. Battery meets NFPA 20 2013 requirements: Section 11.2.7.2.1.4: At 40°F (4°C), each battery unit shall have twice the capacity sufficient to maintain the cranking speed recommended by the engine manufacturer through a 3-minute attempt-to-start cycle, which is six consecutive cycles of 15 seconds of cranking and 15 seconds of rest. Section 11.2.7.2.1.5: Batteries shall be sized, based on calculations, to have capacity to carry the loads defined in 11.2.7.2.3 for 72 hours of standby power followed by three 15-second attempt-to-start cycles per battery unit as defined in 11.2.7.2.1.4 without ac power being available for battery charging. Section 11.2.7.2.3.2: Essential loads, including the engine, controller, and all pump room equipment combined, shall not exceed 0.5 ampere each for a total of 1.5 amperes, on continuous basis.
6. Battery cable length (total circuit) should not exceed the guidelines for minimum size or max circuit resistance as provided on the installation & operation data sheet for the given engine model.
7. Batteries are shipped dry charged and without electrolyte (by others). See "Activation - Dry Charged Batteries."

Activation - Dry Charged Batteries:

1. Use premix battery grade electrolyte (Specific Gravity: 1.265) Each 908D battery will take approximately 18 qts (16.5 L) of electrolyte.
2. Remove the six vents caps for each battery.
3. With proper safety gear (eye protection, gloves, etc.) carefully fill each of the six cells to cover the plates and just below the vent well. **DO NOT OVERFILL!**
4. Re-install vent caps.
5. It is recommended that the battery chargers in fire pump controller are used for 1 day prior to putting batteries/engine in service.
6. After initial charge, check level of electrolyte in all cells. If required, add additional electrolyte to bring all levels to the bottom of the vent wells. **DO NOT OVERFILL!** If batteries require top-off while in service, add water. **DO NOT ADD ACID.**

12V 908D BATTERY KIT, CLAKE P/N: C07844 (FIGURE 1)			
Item	Clarke P/N	QTY	Description
1	C07633	2	Battery - 908D, Dry, 1400 CCA, 12V
2	C07001	1	Battery Rack
3	C071171	2	Battery Cable - Negative/Ground
4	C071172	2	Battery Cable - Positive/Starter

24V 908D BATTERY KIT, CLAKE P/N: C07688 (FIGURE 2)			
Item	Clarke P/N	QTY	Description
1	C07633	4	Battery - 908D, Dry, 1400 CCA 12V
2	C07001	2	Battery Rack
3	CO71171	2	Battery Cable - Negative/Ground
4	C071172	2	Battery Cable - Positive/Starter
5	C07631	2	Battery Cable - Negative to Postive

NOTE: CABLES NOT TO SCALE

Figure 1:
12V Negative Ground System

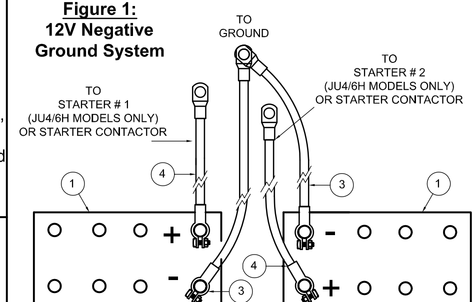
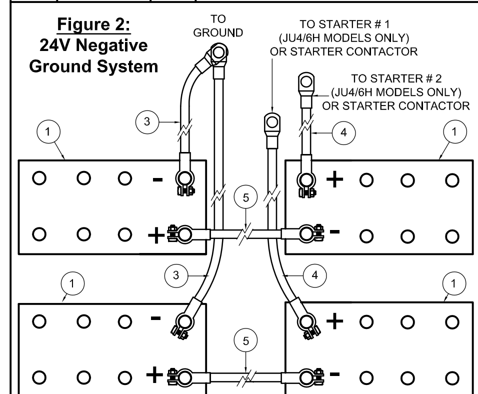


Figure 2:
24V Negative Ground System



REV	DESCRIPTION	ECN#	DWN	APVD	DATE
P	UPDATED BATTERY DETAILS AND RACKS	3861	MJM	JCA	13MAY16
Q	UPDATED BATTERY DETAIL FOR SLOTS	4776	CRD	JCA	25OCT16
R	ADDED CJ4H ENGINE MODELS	4134	WKH	ASC	03JAN16

MACHINE TOLERANCES		
DECIMAL	mm	Inch
X.	±1.5	
X.X	±0.8	±0.06
X.XX	±0.3	±0.03
X.XXX	±0.025	±0.01
X.XXXX		±0.001
ANGULAR: ±0.5°		

FABRICATION TOLERANCES		
DECIMAL	mm	Inch
X.	±3	
X.X	±1.5	±0.12
X.XX		±0.06
ANGULAR: ±1.0°		

YES NO
CONTROLLED DRAWING

CLARKE
Fire Protection Products, Inc.

DRWN JAUGENSTEIN
DATE 31JUL10
ENGR KWAULIGMAN

NAME CLARKE USA SUPPLIED LEAD-ACID BATTERY KIT SPECIFICATIONS (FOR USE ON FIRE PUMP INSTALLATIONS THAT ARE UL, FM, & NFPA20)

PART NO. C131885 REV R

UNITS MM [INCH] PAGE 1 OF 1

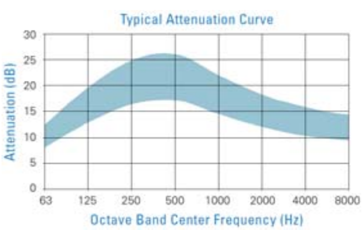
END INLET, END OUTLET

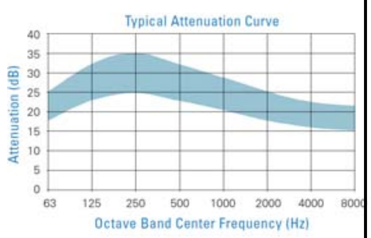
2"-3.5" NPT CONNECTIONS

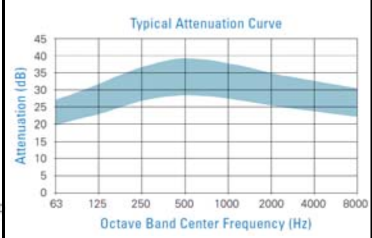
INDUSTRIAL					RESIDENTIAL					CRITICAL					HOSPITAL				
P/N	A	B	D	Wgt#	P/N	A	B	D	Wgt#	P/N	A	B	D	Wgt#	P/N	A	B	D	Wgt#
C06540	2.00	6	24.00	15	C06528	2.00	6	30.00	20	C06514	2.00	6	42.00	31	C06716	2.00	10	44.00	54
C06541	2.50	8	24.00	22	C06529	2.50	8	30.00	28	C06515	2.50	8	42.00	42	C06717	2.50	12	46.00	69
C06542	3.00	8	25.00	26	C06530	3.00	8	31.00	32	C06516	3.00	8	43.00	45	C06718	3.00	12	46.00	70

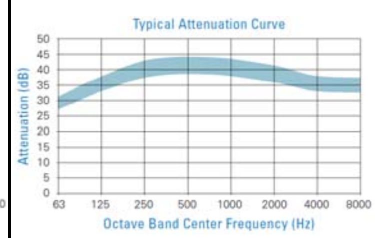
4"-12" 150# ANSI FLANGE

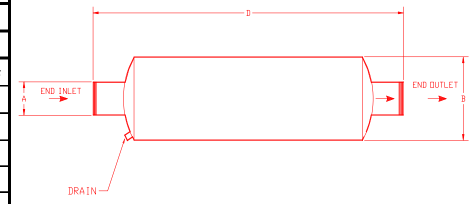
INDUSTRIAL					RESIDENTIAL					CRITICAL					HOSPITAL				
P/N	A	B	D	Wgt#	P/N	A	B	D	Wgt#	P/N	A	B	D	Wgt#	P/N	A	B	D	Wgt#
C06544	4.00	10	32.00	45	C06532	4.00	10	44.00	61	C06518	4.00	10	56.00	83	C06720	4.00	14	60.00	111
C06545	5.00	12	44.00	67	~~C06533~~	~~5.00~~	~~12~~	~~56.00~~	~~91~~	C06519	5.00	12	68.00	117	C06721	5.00	18	68.00	176
C06546	6.00	12	44.00	74	C06534	6.00	12	56.00	98	C06520	6.00	12	68.00	131	C06722	6.00	18	68.00	184
C06547	8.00	18	56.00	142	~~C06535~~	~~8.00~~	~~18~~	~~68.00~~	~~177~~	C06521	8.00	18	92.00	235	C06723	8.00	26	96.00	394
C06548	10.00	22	72.00	217	C06536	10.00	22	84.00	284	C06522	10.00	22	108.00	342	C06724	10.00	30	110.00	696

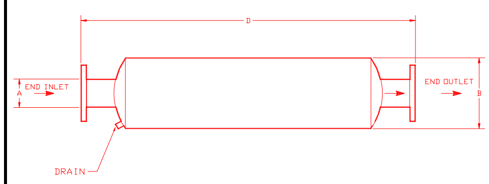












DIMENSIONS ARE IN INCHES

NOTES:

1. DUAL SHELL DESIGN TO ELIMINATE SHELL RADIATED NOISE AND INCREASE DURABILITY.
2. CARBON STEEL CONSTRUCTION.
3. COATED WITH SATIN BLACK PAINT RATED TO 1200°F
4. CONNNECTIONS:
   - -MALE NPT ON 3.5" AND SMALLER
   - -125/150# ANSI FLANGES
5. EQUIPPED WITH PORT PLUGGED DRAIN.
6. ALL WELDED CONSTRUCTION.

REV	DESCRIPTION	ECN#	DWN	APVD	DATE
E	ADDED INDUSTRIAL SILENCERS	4407	DTH	JCA	25FEB16
-	ADDED NPT VIEW	3862	JGV	JCA	21APR16
F	REMOVED 3.5" & 12" AND UPDATED MATERIAL	3862	JGV	JCA	28APR16
G	REMOVED DRAIN FROM OUTLET SIDE	3862	JGV	JCA	06OCT16
H	UPDATED PAGE 2 FIGURES	3862	CRD	JCA	29OCT16

YES NO CONTROLLED DRAWING

CLARKE Fire Protection Products, Inc.

MACHINE TOLERANCE

DECIMAL	mm	inch
X.	± 1.5	
X.X	± 0.8	± 0.06
X.XX	± 0.3	± 0.03
X.XXX	± 0.025	± 0.01
X.XXXX		± 0.001

ANGULAR: ± 0.5°

FABRICATION TOLERANCE

DECIMAL	mm	inch
X.	± 3	
X.X	± 1.5	± 0.12
X.XX		± 0.06

ANGULAR: ± 1.0°

DRWN DMPOTTER
DATE 7/22/1992
ENGR DMPOTTER
MATERIAL
ASSEMBLY ORIGINAL USAGE
SIMILAR TO N/A

NAME SILENCER, EXHAUST (END INLET, END OUTLET) & (SIDE INLET, END OUTLET)

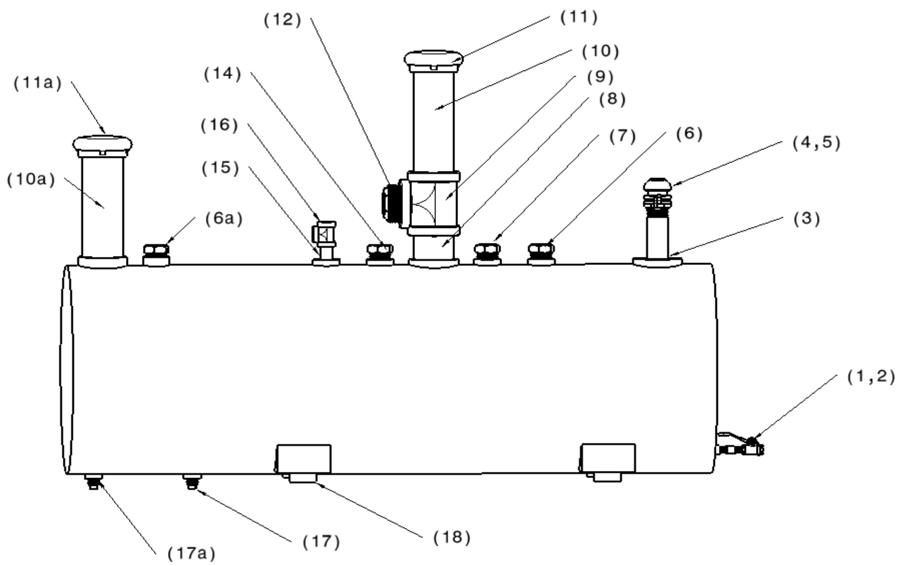
PART NO. D451 REV H

SCALE NTS UNITS MM [INCH] PAGE 1 OF 2

Peerless Pump Company
Indianapolis, IN 46207

DIESEL FUEL SYSTEM
DOUBLE WALL UL TANK

Drawing **99778630**
Date 11/4/2019



Notes

A This fuel system complies with the recommended practices described in the NFPA 20 and UL 142
B Fuel tank outlet must be even with engine fuel pump center line
C Fuel tank should be located as close to the engine as possible
D Fuel tank should be pitched 1/4" (6mm) per foot toward drain plug (17)
E Fuel tank must be located above ground, with provisions to prevent freezing
F The '*Usable Fuel Volume*' is 90% of the '*Fuel Tank Volume*' This will provide a '*Sump Volume*' of 5% and an '*Expansion Volume*' of 5%
G '*Fill Cap*' (5) has provisions to be padlocked closed
H '*Locking Valve*' (1) has provisions to be padlocked open
I '*Fuel Gauge*', if ordered, should be located at the 2" NPT opening (7)
J *Low Level Fuel Switch*', if ordered with controller, should be located at the 1-1/2" NPT opening (14)
K Only items marked with 'Peerless' will be furnished, other items are furnished "*By Other*' to conform to individual job requirements
L Components shown are shipped loose for field assembly
M Illustration is for component identification only. Actual installation must meet local codes and all applicable standards

Fuel System Components - by Peerless Pump				
Scope	Item	Qty	Material	Description
Peerless	1	1	Brass	Valve, Locking pipe *X*" NPT
Peerless	2	1	Steel	Nipple, pipe *X*" NPT
By Other	**3**	**1**	--	Pipe, 2"
Peerless	4	1	Steel	Strainer, 1/16" Mesh
Peerless	5	1	Iron	Cap, Fill 2"
Peerless	6, 6a	2	Iron	Plug, pipe 2" NPT
Peerless	7	1	Iron	Plug, pipe 2" NPT
Peerless	8	1	Steel	Nipple, pipe *Y*" NPT
Peerless	9	1	Iron	Tee, pipe Red'g *Y*" x 2" x *Y*" NPT
By Other	**10, 10a**	**1**	--	Pipe, *Y*"
Peerless	11, 11a	2	Steel	Vent, Weather *Y*" NPT
Peerless	12	1	Iron	Bushing, 1/2" x 2" NPT
By Other	**13**	**1**	--	Pipe or hose
Peerless	14	1	Iron	Plug, pipe 1-1/2" NPT
Peerless	15	1	Steel	Nipple, pipe 1/2" NPT
Peerless	16	1	Iron	Tee, pipe 1/2" NPT
Peerless	17, 17a	2	Iron	Plug, pipe 1" NPT
Peerless	18	4	Steel	Coupling, 2" NPT for legs

Item 1 /	SW Part #		DW Part #	
Item 11	4" Vent	6" Vent	4" Vent	6" Vent
1/2" / Vent	99777371	RTF	99777372	RTF
1/2" / Flm Arr	99777383	RTF	99777384	RTF
3/4" / Vent	99777385	99777389	99777386	99777390
3/4" / Flm Arr	99777387	99777391	99777388	99777392

X" will be either 1/2" or 3/4" depending on fuel supply requirements
Y" - diameter of piping for vent either 4" or 6" dependent on fuel tank sizes

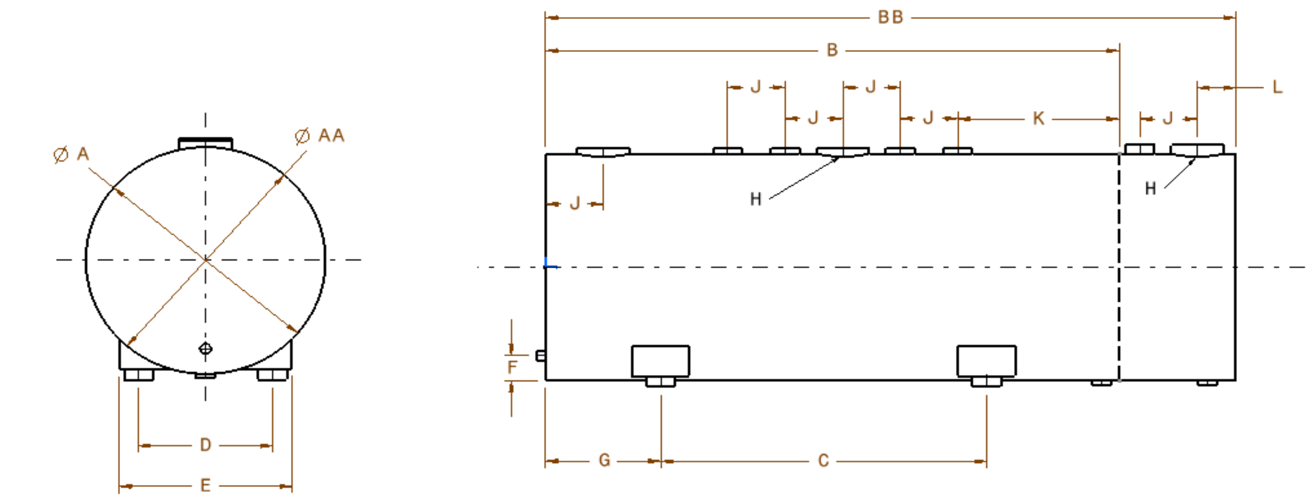
Certified for: ☐ Approval ☐ Construction
Certified by: ____________ Date ____________
Project ____________ Customer: ____________
SO No: ____________ Item/PO: ____________

Subject to change without notice

Peerless Pump Company
Indianapolis, IN 46207

DIESEL FUEL TANK
DOUBLE WALL UL TANK

Drawing 99778630
Date 11/4/2019



Fuel Tank Volume (US Gal)	A	AA	B	BB	C	D	E	F	G	H	J	K	L
	Inner Tank OD	Outer Tank OD	Inner Tank Length	Outter Tank Length	Foot Distance	Foot Width	Outside Foot	Fuel Outlet	Front tank to Foot	Vent Connection Size	Distance	Distance	Distance
70	24 (610)	25 (635)	36 (914)	47 (1194)	24 (610)	16.88 (429)	18 (457)	3.875 (98)	6 (152)	4" NPT	6 (152)	6 (152)	4 (102)
119	24 (610)	25 (635)	61 (1549)	72 (1829)	44 (1118)	14 (356)	18 (457)	3.495 (89)	8.5 (216)	4" NPT	6 (152)	18 (457)	4 (102)
140	24 (610)	25 (635)	72 (1829)	83 (2108)	42 (1067)	17.5 (445)	18 (457)	3.875 (98)	15 (381)	4" NPT	6 (152)	18 (457)	4 (102)
200	32 (813)	33 (838)	60 (1524)	71 (1803)	30 (762)	22.62 (575)	20 (508)	4.375 (111)	8.5 (216)	4" NPT	6 (152)	18 (457)	4 (102)
250	32 (813)	33 (838)	72 (1829)	83 (2108)	42 (1067)	22.62 (575)	20 (508)	4.375 (111)	15 (381)	4" NPT	6 (152)	18 (457)	4 (102)
~~**359**~~	~~38 (965)~~	~~39 (991)~~	~~73 (1854)~~	~~84 (2134)~~	~~44 (1118)~~	~~23 (584)~~	~~27 (686)~~	~~4.875 (124)~~	~~14.5 (368)~~	~~4" NPT~~	~~6 (152)~~	~~18 (457)~~	~~4 (102)~~
460	48 (1219)	49 (1245)	60 (1524)	71 (1803)	30 (762)	34 (864)	34 (864)	5.875 (149)	15 (381)	4" NPT	6 (152)	18 (457)	4 (102)
~~**572**~~	~~48 (1219)~~	~~49 (1245)~~	~~73 (1854)~~	~~84 (2134)~~	~~44 (1118)~~	~~30 (762)~~	~~34 (864)~~	~~5.875 (149)~~	~~14.5 (368)~~	~~4" NPT~~	~~6 (152)~~	~~18 (457)~~	~~4 (102)~~
650	52 (1321)	53 (1346)	71 (1803)	82 (2083)	44 (1118)	30 (762)	34 (864)	6.375 (162)	17.75 (451)	4" NPT	6 (152)	18 (457)	4 (102)
849	64 (1626)	65 (1651)	61 (1549)	72 (1829)	44 (1118)	30 (762)	34 (864)	7.375 (187)	8.5 (216)	4" NPT	6 (152)	18 (457)	4 (102)
1100	64 (1626)	65 (1651)	79 (2007)	90 (2286)	44 (1118)	30 (762)	34 (864)	7.375 (187)	17.7 (450)	6" NPT	6 (152)	18 (457)	4 (102)

Fuel Tank Volume (US Gal)	Part #	
	Tank Only	Tank with (4) legs
70	99777335	99777357
119	99777336	99777358
140	99777337	99777359
200	99777338	99777360
250	99777339	99777361
~~**359**~~	~~99777340~~	~~99777362~~
460	~~99777341~~	99777363
~~**572**~~	~~99777342~~	~~99777364~~
650	99777343	99777365
849	99777344	99777366
1100	99777345	99777367

Notes

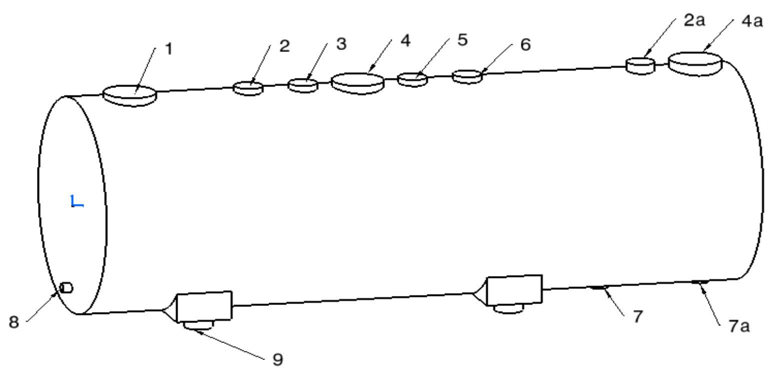
1. All dimensions are noted in inches (mm) and may vary by 1/4"
2. Fuel tank outlet must be even with engine fuel pump center line. Legs for fuel tank are supplied by other.
3. Fuel tank should be located as close to the engine as possible
4. Fuel tank should be pitched 1/4" (6mm) per foot toward drain plug (17)
5. Fuel tank must be located above ground, with provisions to prevent freezing
6. The '*Usable Fuel Volume*' is 90% of the '*Fuel Tank Volume*' This will provide a '*Sump Volume*' of 5% and an '*Expansion Volume*' of 5%
7. Foot connection 2" NPT (4 places), optionally supplied

Certified for: ☐ Approval ☐ Construction
Certified by: ____________ Date ____________
Project ____________ Customer: ____________
SO No: ____________ Item/PO: ____________

Subject to change without notice

Requirements:

1 Fuel tank must comply with the latest version of UL 142 Aboveground Flammable Liquid Tanks
2 Fuel tank must be supplied with a nameplate stating compliance to UL142
3 Tank must be leak proof at 5 to 7 psig per UL 142
4 Tank material will be mild steel unless otherwise stated on purchase order with a thickness compliant to UL142.
5 The "*Usable Fuel Volume*" is 90% of the '*Fuel Tank Volume*'. This will provide a '*Sump Volume*' of 5% and an '*Expansion Volume*' of 5%
6 Minimum of a threaded plastic plugs to be installed in all openings
7 Exterior will be painted with red primer paint (Rust-Oleum #7769402 Rusty Metal Primer)
8 Provision for leg connection, legs optionally required
9 Skidding for each tank will conform to Peerless skid drawing **99778631**
10 Markings on on either skid or end of tank to minimally include Peerless part number and Purchase order number
11 Per NFPA 20 (sec 11.4.1.5.1.1) Fill pipes that enter the top of the tank shall terminate within 6 in. (152 mm) of the bottom of the tank and shall be installed or arranged so that vibration is minimized
12 A 1/2" pipe installed in position #6 shall be supplied terminating 3" from bottom of the tank and shall be installed or arranged so that vibration is minimized
13 Actual connection size can be larger with a bushing installed by manufacturer to required connection size.



	1	2	2a	3	4	4a	5	6	7	7a	8	9
Fuel Tank Volume (US Gal)	Inlet for fuel (includes 2" black pipe see Item 12)	Optional Active Fuel Maintenance Return	Connection, dual wall optional monitoring	Optional Fuel Gauge	Vent	Vent, dual wall	Optional Controller low level fuel switch	Fuel Return Line (see item 12)	Drain	Drain, dual wall	Fuel Line to Engine	Leg connection
70	2" NPT	2" NPT	2" NPT	2" NPT	4" NPT	4" NPT	1-1/2" NPT	1/2" NPT	1" NPT	1" NPT	3/4" NPT	2" NPT
119	2" NPT	2" NPT	2" NPT	2" NPT	4" NPT	4" NPT	1-1/2" NPT	1/2" NPT	1" NPT	1" NPT	3/4" NPT	2" NPT
140	2" NPT	2" NPT	2" NPT	2" NPT	4" NPT	4" NPT	1-1/2" NPT	1/2" NPT	1" NPT	1" NPT	3/4" NPT	2" NPT
200	2" NPT	2" NPT	2" NPT	2" NPT	4" NPT	4" NPT	1-1/2" NPT	1/2" NPT	1" NPT	1" NPT	3/4" NPT	2" NPT
250	2" NPT	2" NPT	2" NPT	2" NPT	4" NPT	4" NPT	1-1/2" NPT	1/2" NPT	1" NPT	1" NPT	3/4" NPT	2" NPT
~~**359**~~	~~2" NPT~~	~~2" NPT~~	~~2" NPT~~	~~2" NPT~~	~~4" NPT~~	~~4" NPT~~	~~1-1/2" NPT~~	~~1/2" NPT~~	~~1" NPT~~	~~1" NPT~~	~~3/4" NPT~~	~~2" NPT~~
460	2" NPT	2" NPT	2" NPT	2" NPT	4" NPT	4" NPT	1-1/2" NPT	1/2" NPT	1" NPT	1" NPT	3/4" NPT	2" NPT
~~**572**~~	~~2" NPT~~	~~2" NPT~~	~~2" NPT~~	~~2" NPT~~	~~4" NPT~~	~~4" NPT~~	~~1-1/2" NPT~~	~~1/2" NPT~~	~~1" NPT~~	~~1" NPT~~	~~3/4" NPT~~	~~2" NPT~~
650	2" NPT	2" NPT	2" NPT	2" NPT	4" NPT	4" NPT	1-1/2" NPT	1/2" NPT	1" NPT	1" NPT	3/4" NPT	2" NPT
849	2" NPT	2" NPT	2" NPT	2" NPT	4" NPT	4" NPT	1-1/2" NPT	1/2" NPT	1" NPT	1" NPT	3/4" NPT	2" NPT
1100	2" NPT	2" NPT	2" NPT	2" NPT	6" NPT	6" NPT	1-1/2" NPT	1/2" NPT	1" NPT	1" NPT	3/4" NPT	2" NPT

Basic Material No.:

Dimension of Basic Material:

Type of Basic Material:

Drawing Type: Shop

Related Drawing:

Chg Note | Date Int. | Third Angle Projection

Peerless Pump

2005 Dr Martin Luther King Jr St
Indianapolis, IN 46202

Description:
Fuel Tank
UL 142 - Double Wall

Scale: None
DO NOT Scale Drawing

Drawer: 40886 | Date: 11/4/2019
Approver: 41119 | Date: 11/4/2019

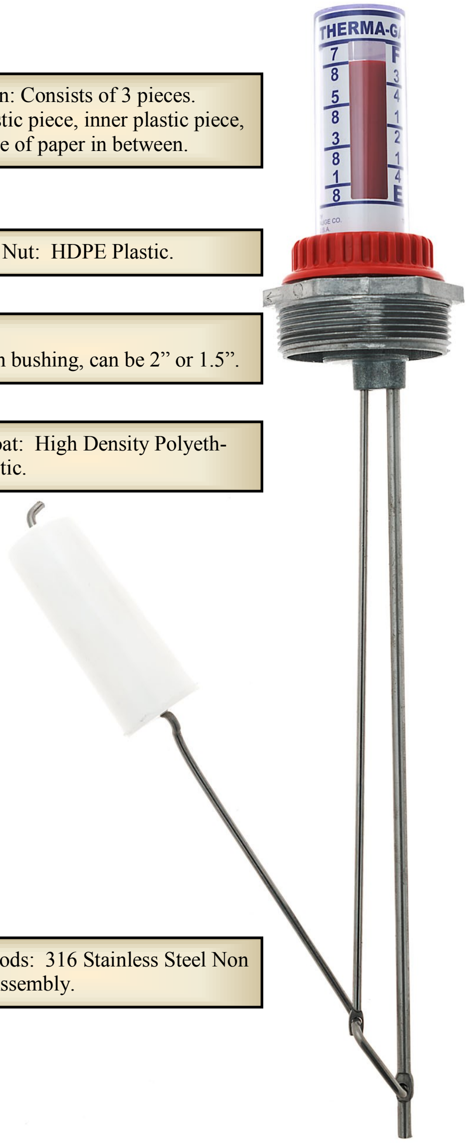
Replaced:

Replaced by:

Drawing No.: 99777335

Page 1 of 1

Therma Gauge Stainless Level One—Type H-S1



Calibration: Consists of 3 pieces. Outer plastic piece, inner plastic piece, and a piece of paper in between.

Red Lock Nut: HDPE Plastic.

Bushing:
Aluminum bushing, can be 2” or 1.5”.

HDPE Float: High Density Polyethylene Plastic.

Internal Rods: 316 Stainless Steel Non Riveted Assembly.

Part Number—
H-(size opening)-(tank depth)+(ext)-(S1)
Sample—H-2-48+12-S1

What it is:

Top mounted liquid level gauge that can measure from 6 inches to 144 inches in depth. Bushing size can be 2” or 1.5”. Gauges are custom made in house to fit your tank. Can also accommodate for double walls and pipe risers. <u>The Type H Gauge has a 2 piece bushing construction that allows you to aim your swing arm away from walls, corners, and other obstructions.</u>

Additional Options - Not included:

Audible Alarm Accessory: This add on feature can turn your mechanical gauge into an audible Hi or Lo level alarm.

LED At-A-Glance Accessory: Another add on feature. This can give your mechanical gauge remote reading capability.

Gauge Guard: A cover that protects the exposed plastic components on top of the gauge.

Replacement Parts -

H-Kit - Replaces all of the gauge components from the red lock nut and up. Includes: Red HDPE Plastic Nut, Duro Nitrile Gasket, Plastic Cellulose acetate inner and outer calibration.

HG-Kit-ALN - Replaces all of the gauge components from the red lock nut and up with upgraded parts. Includes: Aluminum Lock Nut, Duro Nitrile Gasket, Plastic Cellulose acetate outer calibration, Glass inner calibration.

Instructions for Operation:

This gauge is a simple volume reading tool. The top of the red indicator is an indication of your approximate fuel level in your tank. Once installed, you simply view the calibration to monitor your tank level. Indicator is calibrated in eighths of a tank on one side, and quarters of a tank on the other.

Krueger Sentry Gauge
1873 Siesta Lane
Green Bay, WI 54313

www.ksentry.com

Contact us for more info:
Ph: 920-434-8860
Fax: 920-434-8897

Email: info@ksentry.com

Flotronix

LEAK SENSING FLOAT SWITCH ASSEMBLY FOR DOUBLE WALL TANKS

MODEL # FLO-L10785

Description

- **Complete leak sensing switch assembly, designed for easy mounting on double wall fuel tanks**
- **Mounts directly in the 1" NPT annular space drain found on most fuel tanks**
- **Complete assembly, including magnetic float switch with contact, cast iron tee and fittings and large conduit housing – no other parts required!**
- **Simple to install and wire to controller or alarm panel**

Specifications

- **Float switch – polypropylene**
- **Conduit housing – polypropylene**
- **Tee and fittings – cast iron**
- **Switch contact – normally open (N.O.) closed to alarm**
- **Contact rating – 1 amp max. @ 24VDC resistive, .08 amp @ 120VAC resistive, pilot duty only**
- **Weight – 4 lbs.**

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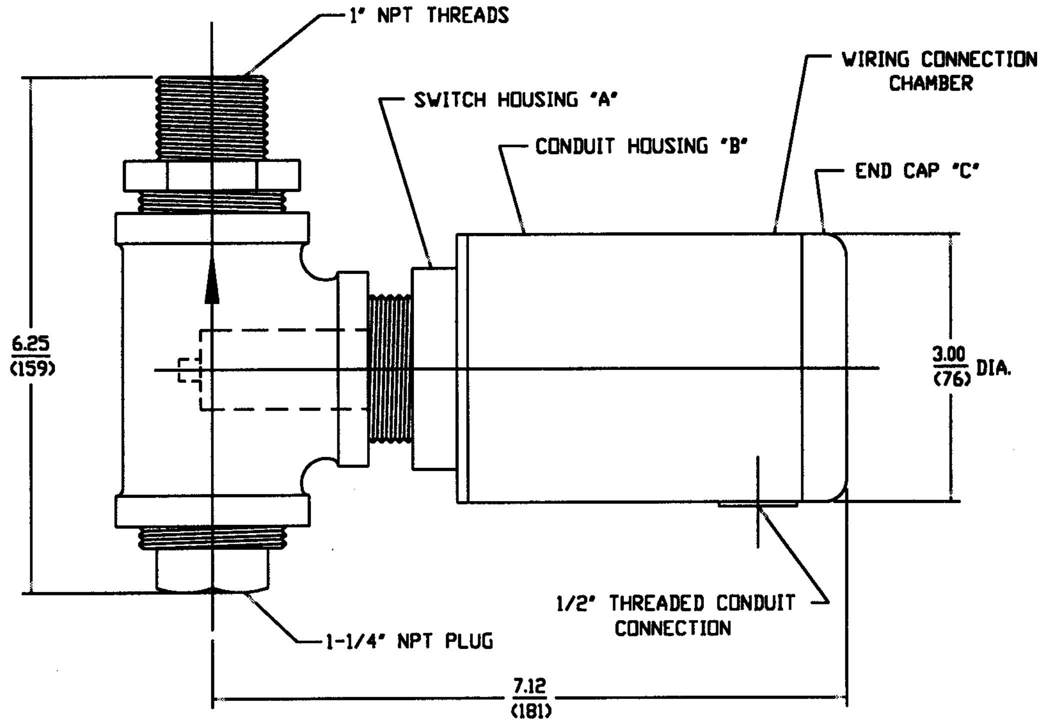


Installation notes:

1. The leak detection switch assembly is direction sensitive. It must be installed in the annular space drain opening on the bottom of the fuel tank with the 1" fitting facing upward. The direction arrow on the tee must be pointing up.
2. The threaded switch housing 'A' of the leak detection switch is glued into the 1-1/4" tee. It must remain in this configuration for proper operation. To verify the correct position, the switch housing 'A' has a "TOP" label affixed.
3. The unit is shipped with the 1/2" conduit fitting pointing down. It may be reconfigured so that it is pointing up by following the procedures below:
   a. Turn the conduit housing 'B' counter-clockwise 1/4 turn to release the conduit housing 'B' from the switch housing 'A'. Make sure that the switch housing 'A' does not turn in relation to the tee.
   b. Rotate the conduit housing 'B' 180 degrees and insert it back into the threaded portion.
   c. Turn the conduit housing 'B' clockwise 1/4 turn to tighten. Make sure that the switch housing 'A' does not turn in relation to the tee.
4. The wiring connection chamber is accessed by unscrewing the end cap 'C'. To unscrew end cap 'C', turn it counter-clockwise. Make sure that the switch housing 'A' does not turn in relation to the tee.
5. After making the electrical connection, reinstall the end cap 'C'. Make sure that the switch housing 'A' does not turn in relation to the tee.

Specifications:

1) Contact is 'normally open' (N.O.) closed to alarm.
2) Contact rating: 1 amp max @ 24VDC resistive, .08 amp @ 120 VAC resistive, pilot duty.
3) Shipping weight 4 LBS. / 1.82 kg.
4) Dimensions in inches and (millimeters)

PATENT PENDING

Flotronix

ENGINEERED CONTROL SPECIALISTS

FLOTRONIX CORPORATION
8481 BASH STREET, UNIT 1500
INDIANAPOLIS, INDIANA 46250
(317) 849-7377
(FAX: (317) 849-7337

LEAK SENSING FLOAT SWITCH FOR DOUBLE WALL TANKS

DATE:	DWG/REVISED
1/29/00	C.M.
5/4/00	VGW

MODEL #	FLO-L10785
DWG #	00001
SHEET #	1 OF 1
CHECKED BY:	J.A.K.R.
SCALE:	1:2

Diesel Engine Fire Pump Controllers

Product Description

The DIESEL Plus Fire Pump Controllers from Eaton are designed to control and monitor 12 or 24 volt, diesel fire pump engines and are among the most technically advanced diesel engine controllers available.

They are an enhanced version of the original microprocessor-based, FD100 Series of diesel engine controllers. Programming is straightforward due to the use of the core firmware and menu structure utilized in the LMR Plus Series of electric controllers.

The controller can be ordered with the option to display and output current values and status, on command, from various software protocols.

An embedded web page for retrieving diagnostics and history reports, can be accessed from the optional Ethernet communication port. An optional RS485 serial port can be used for direct connection to a computer for data transfer.

Product Features

Communication

Embedded Web Page

The embedded web pages allow the user to view the current status of the controller as well as all amperage readings, set points, diagnostics, statistics, configuration and history. An external computer connected via the optional ethernet port is used to access the pages. The specific data required can be downloaded for reference purposes.

Communication Types

USB

The USB port is used to download the controller message history, statistics, diagnostics, status and configuration data to a USB disk drive. The USB port can also be used to upload custom messages, additional languages, and update the microprocessor firmware.

Ethernet

An external computer can communicate with the Diesel Plus controller via the optional ethernet port. An embedded web page will display the controller's current status, as well as display all current readings, set points and history.

Modbus

The Diesel Plus fire pump controllers have the option to communicate to systems using the Regular level of Modbus (includes both RTU and ASCII transmission modes). Communication settings are user configurable through the Diesel Plus configuration menu.

Field Connections

Standard Inputs

- Remote Start
- Fuel Spill
- Deluge Valve
- Low Suction
- Interlock On
- Pump Start
- Low Fuel
- Programmable Inputs (9)

Programmable Inputs

Up to 9 additional, programmable inputs can be programmed to indicate up to 13 different types of inputs. They can be programmed to energize the common alarm output, link to relays and optional LED's and latch until reset by the user.

All optional inputs, outputs and LED's can be linked, as required. They can also be programmed with time delay functions.

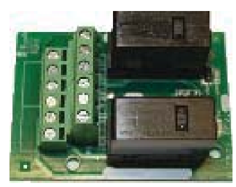
Standard Output Relays

All standard output relays are 8 amp, DPDT.

- Future # 1
- Future # 2
- Low Fuel
- Auto Mode
- Common Alarm

Optional Output Relays

There is provision to add up to eight additional relay outputs, via four optional relay output boards which mount in a snap-on configuration. Each board contains a maximum of 2 additional relays.



Engine Run Relay

The Power I/O Board houses a 10 Amp engine run relay which is used for alarm purposes, or to power external louvers.

Common Alarm Relay

The FD120 controller has a common alarm relay which de-energizes whenever there are any alarm conditions present. This relay is energized under normal conditions and has LED status indication.

Alarm Relay Rating

All alarm relays are rated 8 amps, 250Vac, resistive load only.

Programmable Outputs

Up to 10 additional, programmable outputs (two standard; eight via optional output boards) can be programmed to indicate up to 45 output conditions. They can be programmed for fail safe and latch until reset by the user. All optional inputs, outputs and LED's can be linked, as required. They can also be programmed with time delay functions. As well, two optional alarm LED's can be programmed for up to 28 alarm conditions.

Power / Voltage

Universal Voltage Supply

The controller can be powered with supply voltages from 100Vac to 240Vac by connecting to the three input terminals L,N,G located on the bottom left of the engine board.

Dual Output

12 or 24Vdc output is selectable via a DIP Switch located on the battery chargers. Note: Each controller is factory set for 12Vdc. If 24Vdc is required from the factory, it should be noted on the ordering information.

Line Filter

A line filter incorporated onto the engine board, is used to reduce/eliminate external incoming voltage transients.

AC Power Disconnect

A breaker located inside the controller on the Engine Board, is used to switch on and off AC power to the unit. It will illuminate when energized.

DC Power Disconnect

The engine board houses two on-board circuit breakers used to switch on or off DC power from the batteries.

Each breaker has an LED mounted on the engine board that illuminates when the breaker is energized.

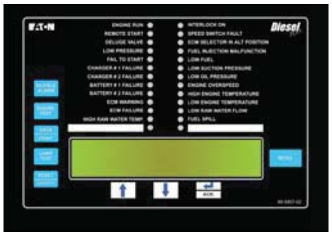
Alarm and Status Indication

Accessibility

All alarm and status LED's as well as the LCD Display and programming buttons are accessible from the front of the controller.

Powering Business Worldwide

LCD Display
The Controller Display Board contains a 4 Line by 40 Characters wide, back-lit, LCD display which is capable of generating multiple languages. The display will show the current system pressure, time and date, charger output voltage and any custom messages, alarms or timer values.



Status LED's
The controller is supplied with six (6) green status LED's for the following:

- LOW PRESSURE
- ENGINE RUN
- REMOTE START
- INTERLOCK ON
- DELUGE VALVE
- One Programmable LED

Alarm LED's
The controller is supplied with twenty (20) red alarm LED's for the following:

- BATTERY #1 FAILURE
- CHARGER # 1 FAILURE
- BATTERY #2 FAILURE
- CHARGER # 2 FAILURE
- LOW PRESSURE
- SYSTEM OVER PRESSURE
- LOW SUCTION PRESSURE
- LOW FUEL
- FAIL TO START
- HIGH ENGINE TEMP
- LOW OIL PRESSURE
- ENGINE OVER SPEED
- ECM SELECTOR IN ALT POSITION
- FUEL INJECTION MALFUNCTION
- ECM WARNING
- ECM FAILURE
- HIGH RAW WATER TEMP.
- LOW ENGINE TEMPERATURE
- FUEL SPILL
- One Programmable LED

Statistics
Up to 26 statistical points are recorded to provide a quick review of how the system has been operating. The statistics can be viewed on the main display, saved to a USB disk drive, or viewed on the embedded webpage.

Diagnostics
Up to fifty three diagnostic points are recorded that can be used to help in troubleshooting issues with the controller. The diagnostics can be viewed on the main display, saved to a USB disk drive, or viewed on the embedded webpage.

Message History
Up to10k alarm/status messages can be stored in the controller memory. They can be viewed on the main display, saved to a USB disk drive, or viewed on the embedded webpage.

DC Fail
A visual indication and audible alarm is provided to indicate DC power loss due to one or both batteries being disconnected from the controller. This indication will also be provided if the controller is not operating due to an electronic board failure.

Programmable Features
- Languages
- (English, French, Spanish Standard. Other languages are available. Consult factory.)
- Date and Time
- Pressure Start and Stop Points
- Low and High Pressure Alarms
- Stop Mode
- Low Suction Shutdown
- Pressure Recording Parameters
- Run Period Timer
- Weekly Test Timer
- Sequential Start Timer
- AC Failure Alarm
- AC Fail to Start

Enclosures

Ratings
All FD120 controllers come standard with NEMA 2 enclosures unless otherwise ordered.
Available options include:
NEMA 3R, 4, 4X, 12.

Reduced Size
A streamlined internal design has allowed the overall size of the DIESEL Plus controllers to be reduced from previous models. See dimensional drawings on our website.

Technical Specifications
- Supply Voltage: 100-240Vac
- Output Voltage: 12-24Vdc
- Hertz: 50/60 Hz
- Enclosure:
  Standard NEMA 2
- ~~Optional NEMA 3R, 4, 4X, 12~~
- Temperature:
  4 to +50 deg. C
  39 to +122 deg. F
- Alarm Relays: DPDT 8amp
- Engine Run Relay:
  DPDT 10amp
- Crank / Fuel Stop Relays: SPDT
- Pressure Transducer: 500psi
- Immunity Compliance:
  Environment A
- Emission Compliance:
  Environment B

Battery Chargers
- Mode: Switching
- Dual 10 Amp
- Communication to Power I/O Board
- Diagnostics Recording
- Lead Acid or NiCadThree Step Charge
- Internal Temperature Monitoring
- Universal Voltage Input
- Selectable Dual Voltage Output

Standards & Certification
The FD120 Diesel Engine Fire Pump Controllers meet or exceed the requirements of Underwriters Laboratories, Factory Mutual Research (FM), the Canadian Standards Association, New York City building code, CE mark and U.B.C. / C.B.C Seismic requirements, and are built to NFPA 20 standards.

Powering Business Worldwide

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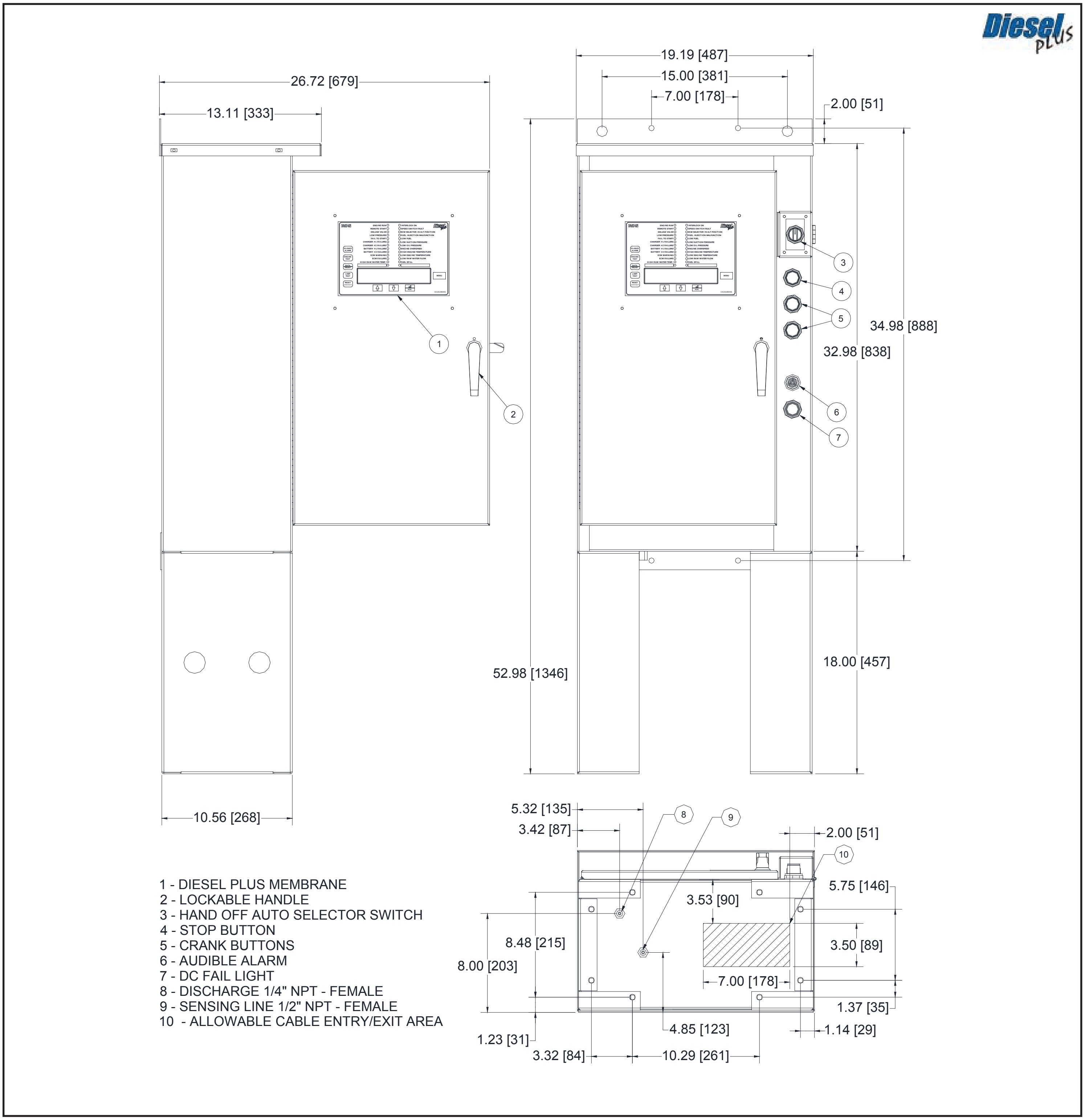


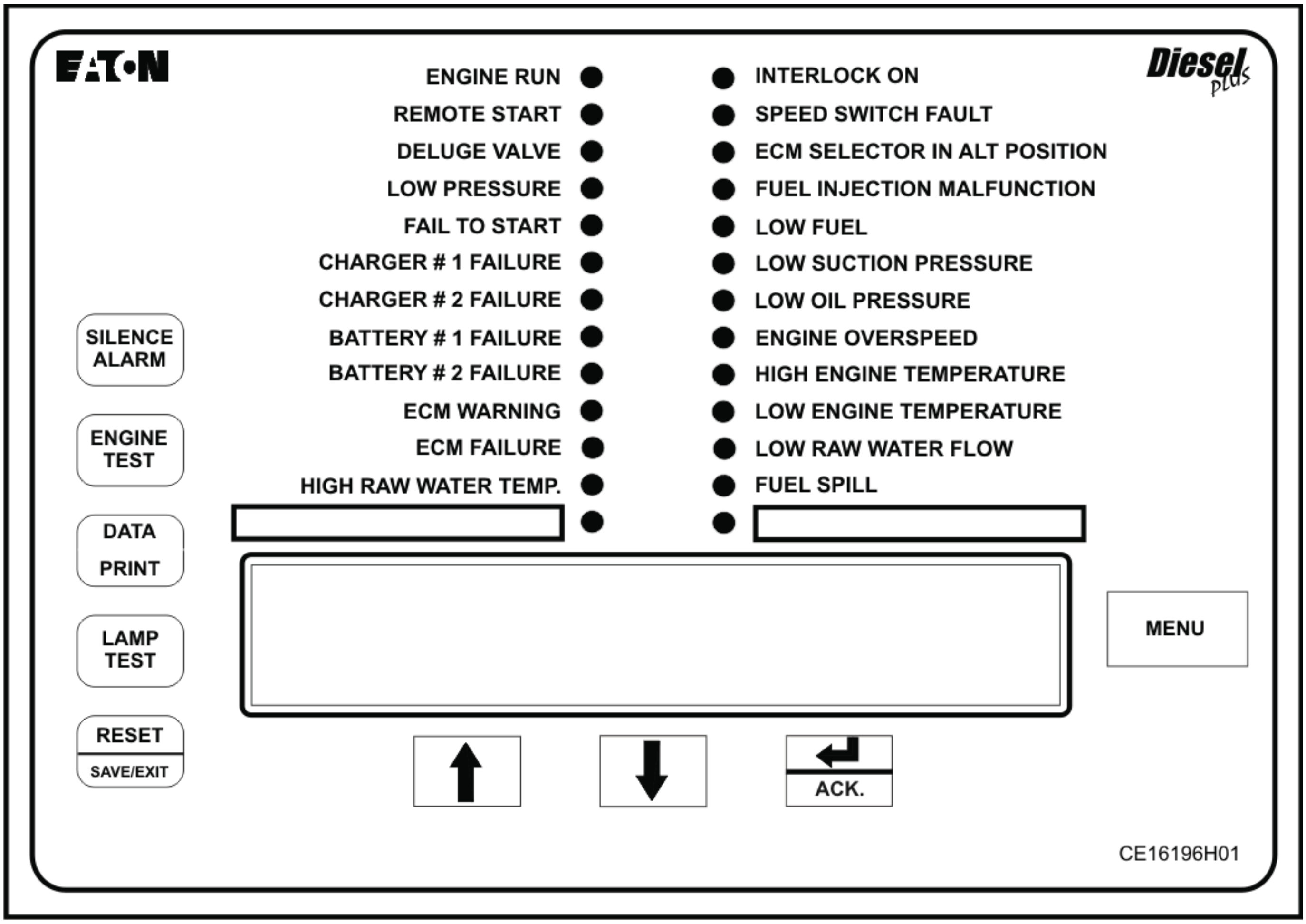
1 - DIESEL PLUS MEMBRANE
2 - LOCKABLE HANDLE
3 - HAND OFF AUTO SELECTOR SWITCH
4 - STOP BUTTON
5 - CRANK BUTTONS
6 - AUDIBLE ALARM
7 - DC FAIL LIGHT
8 - DISCHARGE 1/4" NPT - FEMALE
9 - SENSING LINE 1/2" NPT - FEMALE
10 - ALLOWABLE CABLE ENTRY/EXIT AREA

Approximate Weight

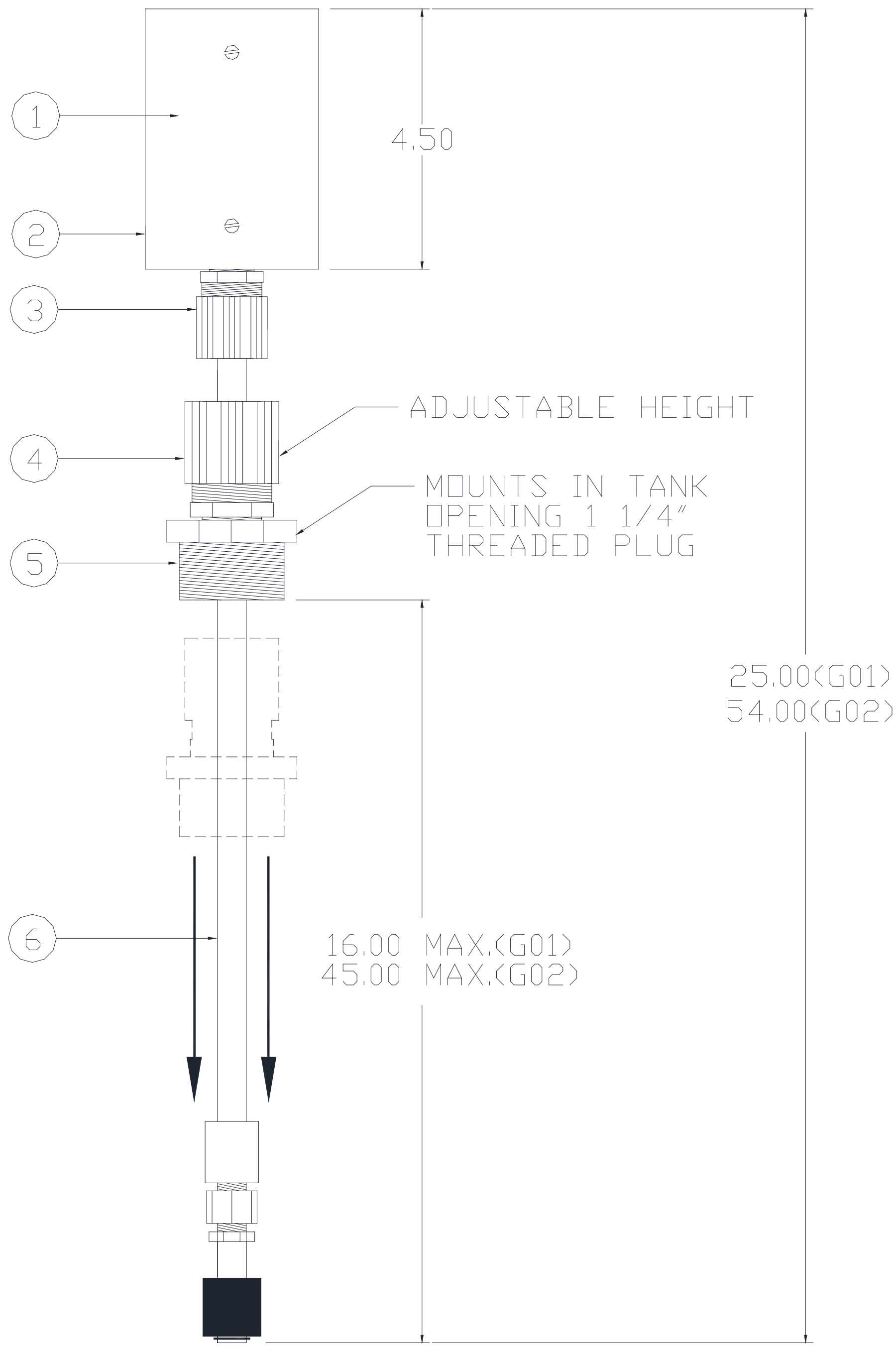
Lbs.	(Kg)
105	(48)

NOTES:
1. All enclosures finished in FirePump red.
2. Cable Entrance bottom only.
3. Standard Enclosure type NEMA 2
4. Enclosure made from #14 Gauge (0.75) HR Steel.
5. Feet are removable.

* NEMA 4, 4X enclosures are supplied:
With 1/4 Turn latches instead of a standard handle.



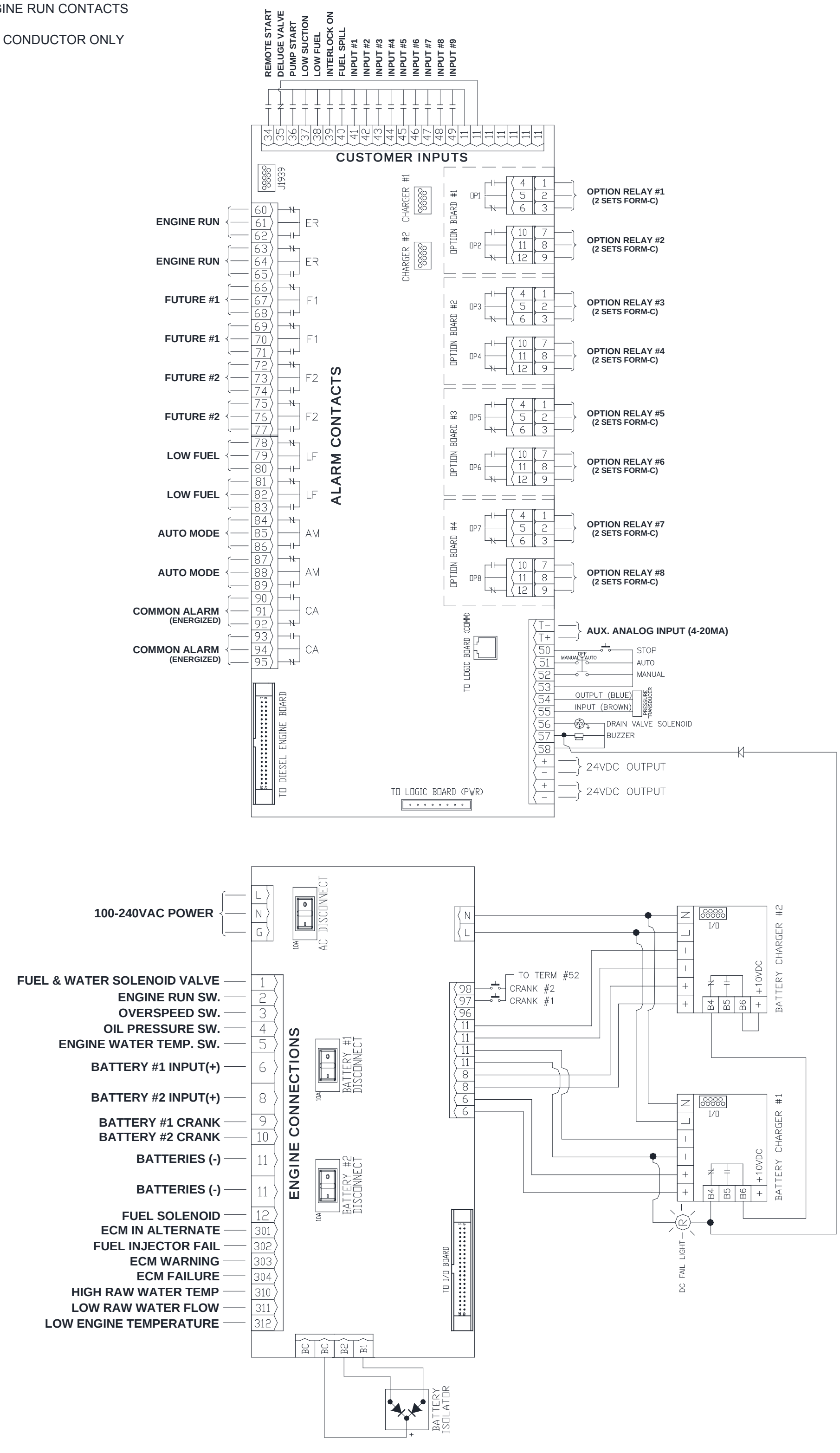
NOTES:
1. Refer to the DIESEL Plus technical manual for details and setup information, as well as programming and custom labeling for the Programmable LED's.



Dimensions in Inches

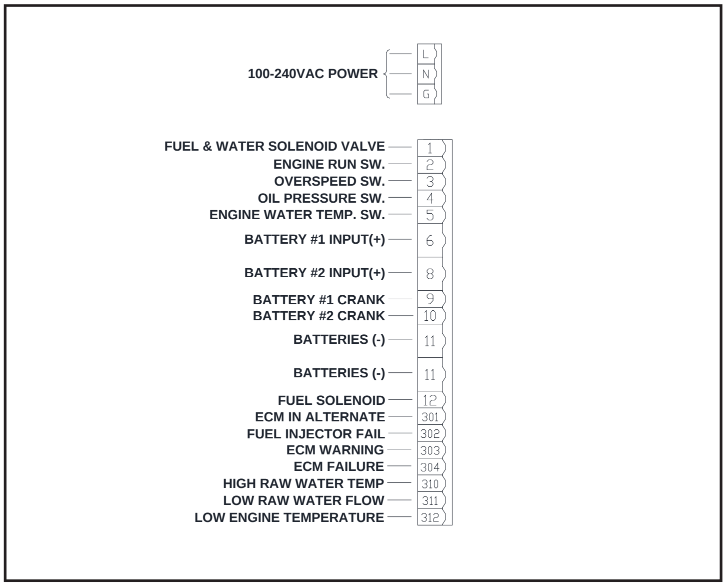
3A14119G01: 16 inch unit
3A14119G02: 45 inch unit

NOTES:
1. DELUGE VALVE INPUT NORMALLY CLOSED. REMOVE JUMPER IF USED.
2. COMMON ALARM OUTPUT NORMALLY ENERGIZED.
3. OUTPUT STATES SHOWN ARE WHEN CONTROLLER IS POWERED AND SET IN OFF MODE.
4. ALARM CONTACTS RATED FOR 8A/250VAC. ENGINE RUN CONTACTS RATED 10A/240VAC.
5. ALARM AND ENGINE WIRES ARE TO BE COPPER CONDUCTOR ONLY

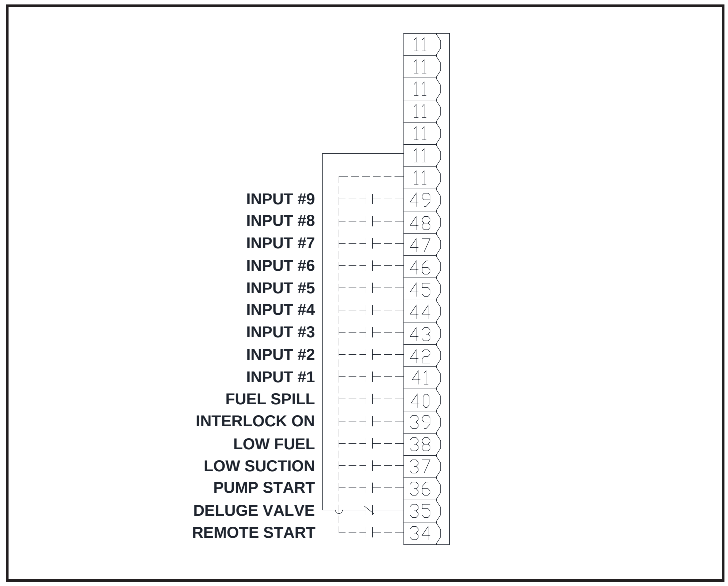


Field Connections

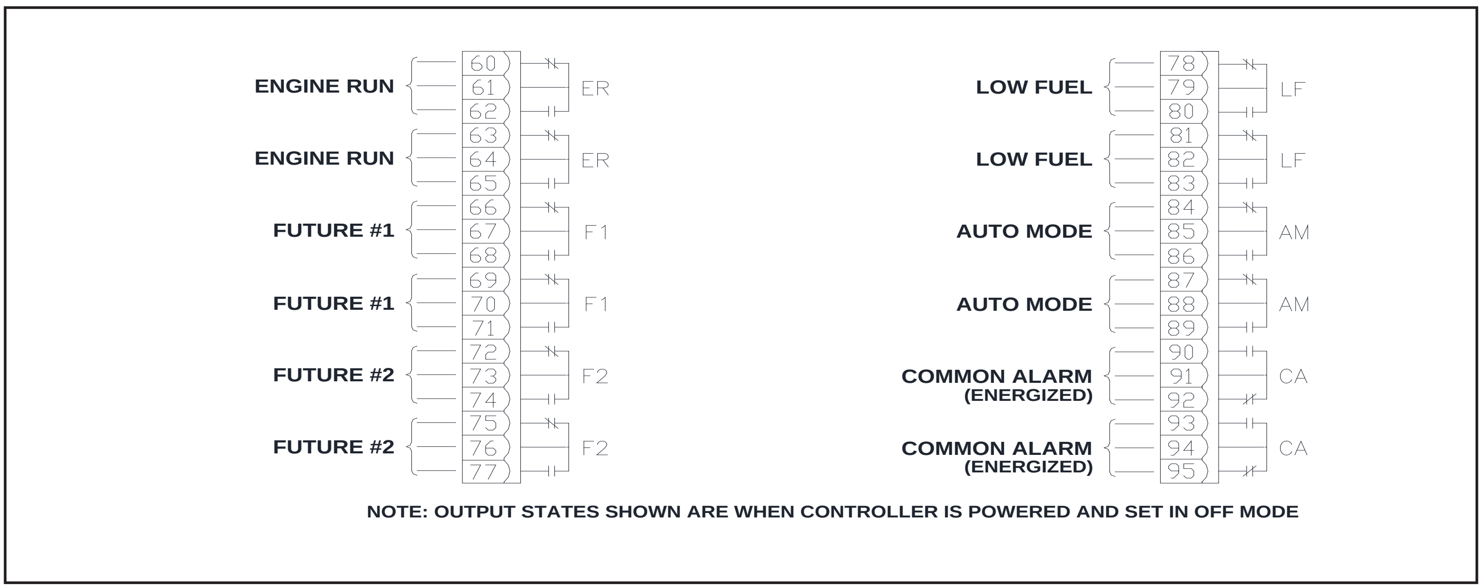
Engine Board Terminal Blocks



Inputs



Outputs



Technical Data and Specifications

Line Terminals (Incoming Cables)

Recommended Wire Size	Terminal Number	Distance
I/O Board		
Stranded # 14 (1.63mm)	11, 34-39, 60-95	N. A.
Stranded # 14 (1.63mm)	Option Board Terminals	N. A.
Engine Board		
Stranded # 14 (1.63mm)	1-5, 9, 10, 12, 301, 302, 303, 304, 310, 311, 312 L, N, G	N. A.
Battery Wire		
Stranded # 10 (2.59mm)	6, 8, 11	0 feet to 25 feet (7.62m)
Stranded # 8 (3.26mm)	6, 8, 11	25 feet to 50 feet (7.62-15.24m)

Technical Data and Specifications - LMR Plus Electric Controllers

Line Terminals on Main Isolation Switch (Incoming Cables)

Qty. & Cable Sizes	
American Wire Gauge (AWG /MCM)	**Diameter (mm)**
(1)#14-1/0 PER Ø (CU/AL)	(1.63 - 5.83 mm)
(1)#4-4/0 PER Ø (CU)	(5.83 - 11.68 mm)
(1)#3-350MCM PER Ø (CU/AL)	(5.83 -15.03 mm)
(2)3/0-250MCM PER Ø (CU/AL)	((10.40 - 12.70 mm)
(2)2/0-250-350MCM PER Ø (CU/AL)	((12.70 - 15.03 mm)
(2)#1-500MCM PER Ø (CU/AL)	((7.35 - 17.96 mm)
(3)3/0-400MCM PER Ø (CU/AL)	((10.40 - 16.06 mm)

Service Entrance Ground Lug - Qty. & Cable Sizes	
American Wire Gauge (AWG /MCM)	**Diameter (mm)**
(1)#14-2/0 PER Ø (CU/AL)	(1.63 - 9.27 mm)
(1)#4-350MCM PER Ø (CU/AL)	(5.19 - 15.03 mm)
(2)1/0-750MCM PER Ø (CU/AL)	(8.25 -22.00 mm)

Load Terminals (To Motor)

Qty. & Cable Sizes	
American Wire Gauge (AWG /MCM)	**Diameter (mm)**
(1)#4-#3 PER Ø (CU)	(1.63 - 5.83 mm)
(1)#4-4/0 PER Ø (CU/AL)	(1.63 - 8.25 mm)
(1)#6-250MCM PER Ø (CU/AL)	(4.11 -12.70 mm)
(2)1/0-250MCM PER Ø (CU/AL)	((8.25 - 12.70 mm)
(2)2/0-500MCM PER Ø (CU/AL)	((9.27 - 17.96 mm)

For Proper Cable Size Refer to National Electrical Code NFPA-70.

Technical Data and Specifications - DIESEL Plus Diesel Engine Controllers

Line Terminals (Incoming Cables)

Recommended Wire Size	Terminal Number	Distance
I/O Board		
Stranded # 14 (1.63 mm)	11, 34-49, 60-95	N. A.
Stranded # 14 (1.63 mm)	Option Board Terminals	N. A.
Engine Board		
Stranded # 14 (1.63 mm)	1-5, 9, 10, 12, 301, 302, 303, 304, 310, 311, 312, L, N, G	N. A.
Battery Wire		
Stranded # 10 (2.59 mm)	6, 8, 11	0 feet to 25 feet (7.62m)
Stranded # 8 (3.26 mm)	6, 8, 11	25 feet to 50 feet (7.62 - 15.24m)

FD120
~~FDF120~~ L1 S1

Language
L1 = English
L2 = French
L4 = Italian
L5 = Spanish
L6 = Portuguese
L7 = Chinese
L8 = Polish
L9 = Dutch
L11 = Turkish

DIESEL Plus Options		
380*	-	Supply Voltage (380V 50/60Hz)
480*	-	Supply Voltage (480V 60Hz)
600*	-	Supply Voltage (600V 60Hz)
COM	-	Communications Option
CX	-	Extra Contacts (Two Form-C; Specify Function)
E1	-	NEMA 3R - Raintight Enclosure
E2	-	NEMA 4 - Watertight Enclosure
E3	-	NEMA 12 - Dust Tight Enclosure
E5	-	NEMA 4X - 304 Stainless Steel
E8	-	Tropicalization
E9	-	NEMA 4X - Painted Steel
E10	-	NEMA 4X - 316 Stainless Steel
EX	-	Export Crating
F2	-	Floor Stand - 2 Inch Height **
LO	-	Powered Louver Contacts - (1.6 Amp Max)
LO+	-	Powered Louver Contacts - (Up to 8.0 Amp)
LX	-	Extra Light (Specify Description)
Ni	-	Ni Cad Batteries
P5	-	Proof Pressure Switch - ALCO - 19-250 PSI
P7	-	Low Suction Pressure Switch
P8	-	Shutdown (Requires P7 Option)
P10	-	Pressure Transducer - Sea Water
P13	-	Externally Mounted Pressure Transducer **
R1	-	Space Heater (120 / 220V)
R2	-	Space Heater c/w Thermostat
R3	-	Space Heater c/w Humidistat
R4	-	Low Room Temperature Switch ***
R5	-	Space Heater (Internally powered - 120V / 240V)
S1	-	Fuel Level Switch, 16 Inch
S2	-	Fuel Level Switch, 45 Inch
S3	-	Fuel Level Switch, High-Low
USB	-	Externally Mounted USB Port
X1	-	Printer
X2	-	4 Inch Chart Recorder (10 - 300 psi fresh water)

Note: All controllers are factory set for 12Vdc operation, unless otherwise noted on the purchase order.
* Standard voltage supplied: 110 / 220V 50/60Hz
** Not available for NEMA 4 or NEMA 4X units.
*** When ordered with a NEMA4 / 4X enclosure, the temperature switch is shipped loose with 20 feet of wire.

April 2015

Diesel Plus Fire Pump Controllers

Typical Specifications

1. Approvals

A. The Fire Pump Controller shall meet Factory Mutual Research (FM) 1321/1323.It shall be listed by [Underwriters Laboratories (UL)], [Canadian Standards Association (CSA)], [New York Department of Buildings (NYSB)] for fire pump service.

B. The controller shall be [12 volt ~~/ 24 volt~~] negative ground, for use with Diesel Engine, Model manufactured by Clarke.

2. Construction

A. All internal components shall be front mounted and wired for ease of inspection and maintenance. All relays shall have visual indication to show that the relays are energized. The controller shall include an LCD display to indicate battery voltage and amperes as well as system pressure, in PSI or Bars.

B. The controller shall have twin battery chargers meeting Factory Mutual Research (FM) requirements. The battery chargers shall have reverse polarity protection/ indication and be capable of recharging a completely discharged battery within 24 hours. The chargers shall auto detect the input voltage of 100VAC to 240VAC and shall be able to be programmed for either 12VDC or 24VDC output.

C. The controller shall come standard with a breaker disconnect on the AC line and for both battery connections.

3. Pressure Sensor

A. A solid-state 4-20mA pressure sensor shall be provided. The pressure Start and Stop points shall be adjustable in increments of one (1) PSI. A low pressure pre-alarm, indicated with a flashing green LED, shall denote a potential pump starting condition and will remain lit once the pump has started to indicate the starting cause.

4. Output Relays

A. Two (2) sets of alarm contacts (Form-C) rated at 8A, 250VAC/30VDC, shall be provided for remote indication of:
1. ENGINE RUN (10A)
2. LOW FUEL
3. AUTO MODE
4. COMMON ALARM

B. Two (2) 'FUTURE' relays, each containing two sets of alarm contacts (Form-C) shall be provided. Relays can be factory set to indicate a specific alarm and shall be field programmable / adjustable to meet future site requirements:

C. The Common Alarm relay shall be energized under normal conditions.

5. Enclosure

A. The controller shall be housed in a NEMA Type 2 (IEC IP11) drip-proof, powder baked finish, freestanding enclosure.

~~B. Optional Enclosures:~~
~~1. NEMA 3R (IEC IP24) rain tight enclosure.~~
~~2. NEMA 4 (IEC IP66) watertight enclosure.~~
~~3. NEMA 4X (IEC IP66) watertight 304 stainless steel enclosure.~~
~~4. NEMA 4X (IEC IP66) watertight 316 stainless steel enclosure.~~
~~5. NEMA 4X (IEC IP66) watertight corrosion resistant enclosure.~~
~~6. NEMA 12 (IEC IP54) dust tight enclosure.~~

6. Microprocessor Control

A. The following parameters shall be programmable and included as standard:
1. START and STOP PSI points
2. High and Low Pressure Alarm Setpoints
3. STOP MODE: Manual or Auto
4. RUN PERIOD TIMER: 0-60 min
5. AC POWER FAILURE: Enable or Disable
6. SEQUENTIAL START TIMER: 0-300 sec.
7. WEEKLY TEST TIMER
8. PRESSURE DEVIATION: 1-99 PSI
9. LANGUAGE: English/French/Spanish/Other

B. The following visual and audible alarms shall be provided:

FAIL TO START
LOW OIL PRESSURE
ENGINE OVERSPEED
BATTERY #1 FAILURE
BATTERY #2 FAILURE
REMOTE START
LOW PRESSURE
SPEED SWITCH FAULT
ECM SELECTOR IN ALT POSITION
FUEL INJECTOR MALFUNCTION
STARTER #1 FAILURE
STARTER #2 FAILURE
TRANSDUCER FAILURE
DATA CABLE DISCONNECT
DC FAIL
HIGH ENGINE TEMP.
ENGINE RUN
LOW FUEL
CHARGER #1 FAILURE
CHARGER #2 FAILURE
DELUGE VALVE
INTERLOCK ON
LOW SUCTION
ECM WARNING
ECM FAILURE
HIGH RAW WATER TEMPERATURE
LOW ENGINE TEMPERATURE
LOW RAW WATER FLOW
FUEL SPILL

Diesel Plus Fire Pump Controllers

C. The controller shall have a 4 line by 40 character LCD display mounted on a panel opening in the front door. The LCD display shall indicate the following:
   1. Main screen displaying system pressure, Battery #1/#2 voltage and amperage, operation mode, shutdown mode, custom messages, alarms, timers, date, and time.
   2. Set point review screen displaying the programmed pressure start and stop points, and weekly test time.
   3. Controller statistics screen, including:
      a. Powered Time
      b. Engine Run Time
      c. Number of Cranks
      d. Number of Starts
      e. Last Engine Start Time
      f. Last Engine Run Time
      g. Last Low Pressure Start
      h. Minimum Battery #1 Voltage
      i. Maximum Battery #1 Voltage
      j. Minimum Battery #2 Voltage
      k. Maximum Battery #2 Voltage
      l. Minimum Battery #1 Amps
      m. Maximum Battery #1 Amps
      n. Minimum Battery #2 Amps
      o. Maximum Battery #2Amps
      p. Minimum System Pressure
      q. Maximum System Pressure
      r. Last System Startup
      s. Last Engine Test
      t. Last Low Oil Pressure
      u. Last Overspeed
      v. Last Fail To Start
      w. Last Low Fuel
      x. Last Charger Failure
      y. Last Battery Failure
      z. Last ECM Alarm
   4. Controller diagnostics screen, including:
      a. Date & Time
      b. Firmware Version
      c. Shop Order Number
      d. Customer Order Number
      e. Battery Voltage
      f. Internal Board Voltage
      g. Transformer Output Voltage
      h. Current Transformer Outputs
      i. Pressure Transducer Calibrated Settings
      j. Input Status
      k. Relay Status
   5. Display last messages screen that will display at least the last 10,000 alarms / messages stored in the controllers' memory.
   6. Display up to ten (10) custom messages of up to 100 characters each, which will continually scroll across the fourth line of the display.
   7. Remaining time left on active timers.

D. The controller shall be supplied with six (6) green status LED's for the following:
   1. Engine Run
   2. Remote Start
   3. Low Pressure
   4. Interlock On
   5. Deluge Valve
   6. One Programmable LED

E. The controller shall be supplied with twenty (20) red alarm LED's to indicate the following:
   1. BATTERY #1 FAILURE
   2. BATTERY #2 FAILURE
   3. CHARGER #1 FAILURE
   4. CHARGER #2 FAILURE
   5. SPEED SWITCH FAULT
   6. ECM SELECTOR IN ALT POSITION
   7. FUEL INJECTION MALFUNCTION
   8. LOW SUCTION PRESSURE
   9. FAIL TO START
   10. HIGH ENGINE TEMP.
   11. LOW OIL PRESSURE
   12. ENGINE OVERSPEED
   13. LOW FUEL
   14. ECM WARNING
   15. ECM FAILURE
   16. HIGH RAW WATER TEMPERATURE
   17. LOW ENGINE TEMPERATURE
   18. LOW RAW WATER FLOW
   19. FUEL SPILL
   20. One Programmable LED

F. The microprocessor logic board shall be available with:
   1. A USB port for transference of message history, controller status, diagnostics, configuration, statistics and the ability to update firmware.
   2. An optional Ethernet port for direct connection to a computer for data transfer.
   3. An optional RS485 Serial port for communication to various external software programs.
   4. An optional RS232 Serial Port

G. The controller shall come complete with an embedded web page which allows viewing of the controllers' current status, data values, programmed set points, and downloadable history.

H. A Fail-to-Start alarm shall occur if the engine does not start after the crank cycle.

I. A sequential start timer, weekly test timer and AC Failure Start timer shall be provided as standard.

J. The controller shall be supplied with interlock and shutdown circuits as standard. A flashing green LED shall indicate an interlock on condition.

Diesel Plus Fire Pump Controllers

K. Where shutdown of the pump(s) due to low suction pressure is required, it shall be accomplished without the addition of a separate panel or enclosure. The LCD display shall indicate low suction shutdown. Resetting of the condition shall be automatic or manual as selected by the user.

L. Means shall be provided to test the operation of all LED's to ensure their functionality.

7. Programming Menu

A. The programming menu shall have the ability to enable an entry password.

B. The programming menu shall be limited to two (2) levels of password protection.

C. The controller shall have three (3) languages as a standard, English, French, and Spanish, with the ability to add a fourth language.

D. The programming menu shall be grouped into 7 main menu headings as follows:

1. Regional Settings
2. Pressure Settings
3. Timer Values
4. Input/Output Menu
5. System Configuration (password protected)
6. Language
7. Main Menu Password

8. Custom Inputs/Outputs

A. The controller shall come standard with nine (9) custom inputs, two (2) programmable LED indicators, and two (2) future outputs, with the ability to add up to another 8 outputs via optional relay boards.

B. The user shall be able to program the future inputs/outputs and optional relays through the main programming menu.

C. The inputs shall be selectable based on the following criteria:

1. User selected message or twenty four (24) predetermined messages.
2. Energize the common alarm relay when the input is received.
3. Link to a future relay and/or LED indicator.
4. Alarm latched until reset.
5. Normally open or closed input.
6. On-delay timer.
7. Energize the buzzer when the input is received.

D. The LED indicators shall be selectable based on the following criteria:
Indication based on a minimum of fourteen (14) predetermined alarms or a custom input.

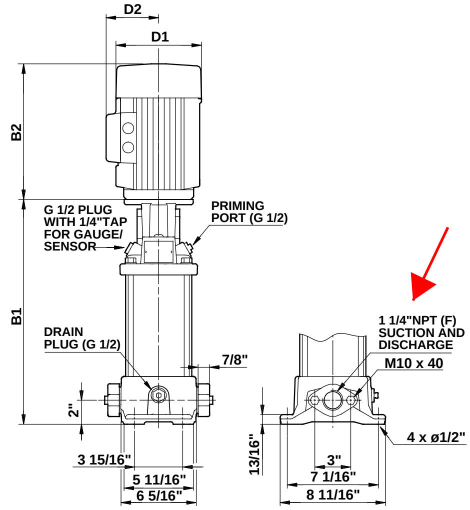
E. The future relays shall be selectable based on the following criteria:

1. Output based on a minimum of forty (40) predetermined alarms, controller status or a custom input.
2. Latched until reset.
3. Energized under normal conditions.
4. On or off delay timer on the output.

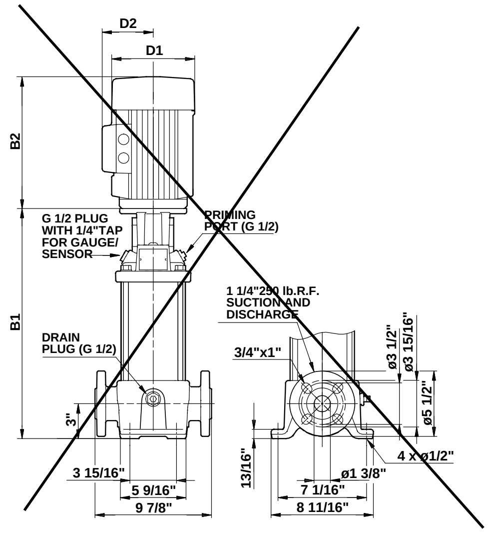
9. Manufacturer

A. The controller shall be microprocessor based as manufactured by Eaton Industries (Canada) Co.

CR 5



TM03 1455 2205



TM03 1451 2205

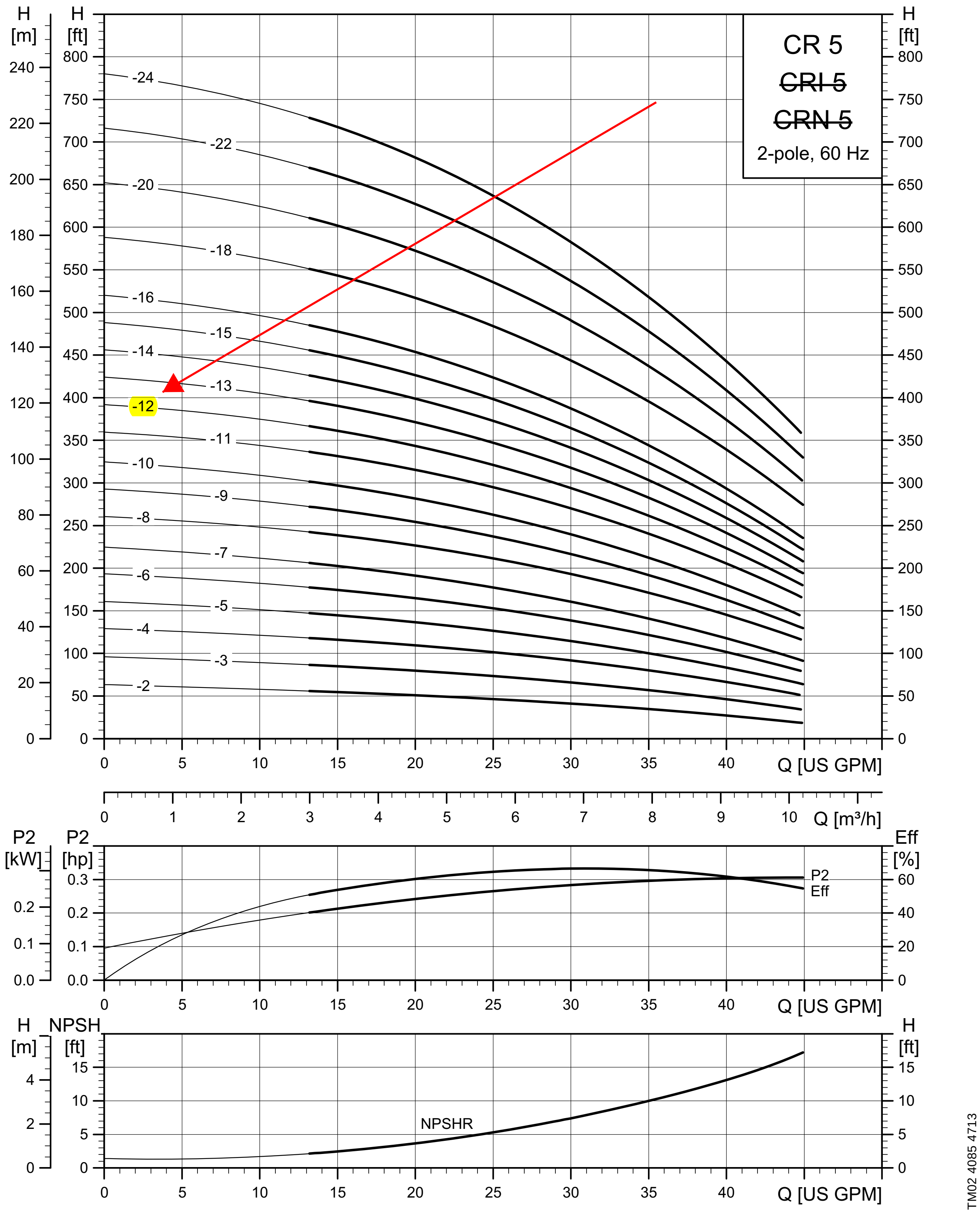
Pump type	P2 [Hp]	Ph.	Oval*	ANSI dimensions [inch (mm)] B1	TEFC D1	TEFC D2	TEFC B1+B2	Ship. wt. [lbs (kg)]
~~CR 5-2~~	~~3/4~~	~~1~~	•	~~11.97 (305)~~	~~6.19 (158)~~	~~5.18 (132)~~	~~21.88 (556)~~	~~77 (35)~~
		~~3~~	•	~~11.97 (305)~~	~~5.55 (141)~~	~~4.57 (117)~~	~~19.41 (494)~~	~~68 (31)~~
~~CR 5-3~~	~~1~~	~~1~~	•	~~13.03 (331)~~	~~7.19 (183)~~	~~5.73 (146)~~	~~24.22 (616)~~	~~90 (41)~~
		~~3~~	•	~~13.03 (331)~~	~~5.55 (141)~~	~~4.57 (117)~~	~~20.47 (520)~~	~~69 (32)~~
~~CR 5-4~~	~~1 1/2~~	~~1~~	•	~~14.09 (358)~~	~~7.19 (183)~~	~~5.73 (146)~~	~~25.77 (655)~~	~~94 (43)~~
		~~3~~	•	~~14.09 (358)~~	~~5.55 (141)~~	~~4.57 (117)~~	~~22.71 (577)~~	~~71 (33)~~
~~CR 5-5~~	~~2~~	~~1~~	•	~~15.16 (386)~~	~~7.19 (183)~~	~~5.73 (146)~~	~~27.72 (705)~~	~~106 (49)~~
		~~3~~	•	~~15.16 (386)~~	~~7.01 (179)~~	~~4.33 (110)~~	~~26.38 (671)~~	~~93 (43)~~
~~CR 5-6~~	~~2~~	~~1~~	•	~~16.22 (412)~~	~~7.19 (183)~~	~~5.73 (146)~~	~~28.78 (732)~~	~~108 (49)~~
		~~3~~	•	~~16.22 (412)~~	~~7.01 (179)~~	~~4.33 (110)~~	~~27.44 (697)~~	~~95 (44)~~
~~CR 5-7~~	~~3~~	~~1~~	•	~~18.39 (468)~~	~~8.60 (219)~~	~~6.87 (175)~~	~~33.04 (840)~~	~~143 (65)~~
		~~3~~	•	~~18.39 (468)~~	~~7.01 (179)~~	~~4.33 (110)~~	~~31.62 (804)~~	~~114 (52)~~
~~CR 5-8~~	~~3~~	~~1~~	•	~~19.45 (495)~~	~~8.60 (219)~~	~~6.87 (175)~~	~~34.10 (867)~~	~~145 (66)~~
		~~3~~	•	~~19.45 (495)~~	~~7.01 (179)~~	~~4.33 (110)~~	~~32.68 (831)~~	~~116 (53)~~
~~CR 5-9~~	~~3~~	~~1~~	•	~~20.51 (521)~~	~~8.60 (219)~~	~~6.87 (175)~~	~~35.16 (894)~~	~~147 (67)~~
		~~3~~	•	~~20.51 (521)~~	~~7.01 (179)~~	~~4.33 (110)~~	~~33.74 (857)~~	~~118 (54)~~
~~CR 5-10~~	~~5~~	~~1~~	•	~~21.57 (548)~~	~~10.62 (270)~~	~~7.46 (190)~~	~~37.09 (943)~~	~~170 (78)~~
		~~3~~	•	~~21.57 (548)~~	~~8.66 (220)~~	~~5.28 (135)~~	~~37.08 (942)~~	~~168 (77)~~
~~CR 5-11~~	~~5~~	~~1~~	•	~~22.64 (576)~~	~~10.62 (270)~~	~~7.46 (190)~~	~~38.16 (970)~~	~~172 (79)~~
		~~3~~	•	~~22.64 (576)~~	~~8.66 (220)~~	~~5.28 (135)~~	~~38.15 (970)~~	~~169 (77)~~
CR 5-12	5	~~1~~	•	~~23.7 (602)~~	~~10.62 (270)~~	~~7.46 (190)~~	~~39.22 (997)~~	~~177 (81)~~
		3	•	23.7 (602)	8.66 (220)	5.28 (135)	39.21 (996)	170 (78)
~~CR 5-13~~	~~5~~	~~1~~	•	~~24.76 (629)~~	~~10.62 (270)~~	~~7.46 (190)~~	~~40.28 (1024)~~	~~178 (81)~~
		~~3~~	•	~~24.76 (629)~~	~~8.66 (220)~~	~~5.28 (135)~~	~~40.27 (1023)~~	~~171 (78)~~
~~CR 5-14~~	~~5~~	~~1~~	•	~~25.83 (657)~~	~~10.62 (270)~~	~~7.46 (190)~~	~~41.35 (1051)~~	~~180 (82)~~
		~~3~~	•	~~25.83 (657)~~	~~8.66 (220)~~	~~5.28 (135)~~	~~41.34 (1051)~~	~~176 (80)~~
~~CR 5-15~~	~~5~~	~~1~~	•	~~26.89 (684)~~	~~10.62 (270)~~	~~7.46 (190)~~	~~42.41 (1078)~~	~~181 (83)~~
		~~3~~	•	~~26.89 (684)~~	~~8.66 (220)~~	~~5.28 (135)~~	~~42.40 (1077)~~	~~177 (81)~~
~~CR 5-16~~	~~5~~	~~1~~	•	~~27.95 (710)~~	~~10.62 (270)~~	~~7.46 (190)~~	~~43.47 (1105)~~	~~182 (83)~~
		~~3~~	•	~~27.95 (710)~~	~~8.66 (220)~~	~~5.28 (135)~~	~~43.46 (1104)~~	~~178 (81)~~
~~CR 5-18~~	~~7 1/2~~	~~1~~	-	~~30.59 (777)~~	~~10.22 (260)~~	~~7.62 (194)~~	~~46.12 (1172)~~	~~200 (91)~~
		~~3~~	-	~~30.59 (777)~~	~~8.66 (220)~~	~~5.28 (135)~~	~~46.19 (1171)~~	~~188 (86)~~
~~CR 5-20~~	~~7 1/2~~	~~1~~	-	~~32.72 (832)~~	~~10.22 (260)~~	~~7.62 (194)~~	~~48.25 (1226)~~	~~203 (93)~~
		~~3~~	-	~~32.72 (832)~~	~~8.66 (220)~~	~~5.28 (135)~~	~~48.23 (1226)~~	~~190 (87)~~
~~CR 5-22~~	~~7 1/2~~	~~1~~	-	~~34.84 (885)~~	~~10.22 (260)~~	~~7.62 (194)~~	~~50.37 (1280)~~	~~300 (137)~~
		~~3~~	-	~~34.84 (885)~~	~~8.66 (220)~~	~~5.28 (135)~~	~~50.35 (1279)~~	~~287 (131)~~
~~CR 5-24~~	~~7 1/2~~	~~1~~	-	~~36.97 (940)~~	~~10.22 (260)~~	~~7.62 (194)~~	~~52.50 (1334)~~	~~302 (137)~~
		~~3~~	-	~~36.97 (940)~~	~~8.66 (220)~~	~~5.28 (135)~~	~~52.48 (1333)~~	~~290 (132)~~

All dimensions in inches unless otherwise noted.

* Oval flanged pump B1 and B1+B2 dimension is one inch less than ANSI flanged pumps and weight is approximately 9 lbs. less.

• Available.

CR, ~~CRI, CRN~~ 5


CR 5
~~CRI 5~~
~~CRN 5~~
2-pole, 60 Hz
H [m]
H [ft]
Q [US GPM]
Q [m³/h]
-24
-22
-20
-18
-16
-15
-14
-13
-12
-11
-10
-9
-8
-7
-6
-5
-4
-3
-2
P2 [kW]
P2 [hp]
Eff [%]
P2
Eff
NPSH [ft]
NPSHR
TM02 4085 4713

TEFC motors

(Totally Enclosed Fan Cooled, constant speed)

~~Baldor motor~~

TM02 7696 3803

Grundfos ML motors

Gr7848sh

GR 7845

TM04 2512 2708

Hp	Ph	Frame	S.F.	Voltage [V]	Motor eff. [%]	Insul. class	KVA code	Full load current [A]	Service factor current [A]	Starting current [A]	Motor type
~~1/3~~	~~1~~	~~56C~~	~~1.35~~	~~115/230~~	~~55~~	~~B~~	~~K~~	~~6.0/3.0~~	~~7.6/3.8~~	~~28/14~~	~~Baldor~~
	~~3~~	~~56C~~	~~1.35~~	~~208-230/460~~	~~78.5~~	~~F~~	~~L~~	~~1.12-1.1/0.55~~	~~1.5-1.45/0.75~~	~~7.1-7.7/3.9~~	~~ML~~
~~1/2~~	~~1~~	~~56C~~	~~1.6~~	~~115/230~~	~~62~~	~~B~~	~~K~~	~~7.4/3.7~~	~~9.8/4.9~~	~~39/19.5~~	~~Baldor~~
	~~3~~	~~56C~~	~~1.25~~	~~208-230/460~~	~~78.5~~	~~F~~	~~K~~	~~1.64-1.55/0.78~~	~~2.0-1.9/0.95~~	~~9.7-10.1/5.1~~	~~ML~~
~~3/4~~	~~1~~	~~56C~~	~~1.25~~	~~115/230~~	~~66~~	~~B~~	~~K~~	~~9.6/4.8~~	~~11.4/5.7~~	~~56/28~~	~~Baldor~~
	~~3~~	~~56C~~	~~1.25~~	~~208-230/460~~	~~79~~	~~F~~	~~K~~	~~2.4-2.3/1.2~~	~~2.9-2.75/1.4~~	~~14.2-15/7.8~~	~~ML~~
~~1~~	~~1~~	~~56C~~	~~1.25~~	~~115/230~~	~~66~~	~~B~~	~~K~~	~~12/6.0~~	~~14.4/7.2~~	~~77/38.5~~	~~Baldor~~
	~~3~~	~~56C~~	~~1.25~~	~~208-230/460~~	~~80~~	~~F~~	~~J~~	~~3.25-3.35/1.68~~	~~4.0-3.9/1.95~~	~~19.2-21.8/10.9~~	~~ML~~
~~1 1/2~~	~~1~~	~~56C~~	~~1.3~~	~~115/208-230~~	~~71~~	~~B~~	~~K~~	~~17/9.5-8.6~~	~~20.4/11.3-10.2~~	~~106/58.6-53~~	~~Baldor~~
	~~3~~	~~56C~~	~~1.15~~	~~208-230/460~~	~~84~~	~~F~~	~~M~~	~~4.7-4.6/2.3~~	~~5.2-5.1/2.55~~	~~33.8-36.8/18.4~~	~~ML~~
~~2~~	~~1~~	~~56C~~	~~1.15~~	~~115/208-230~~	~~74~~	~~F~~	~~K~~	~~23/12.7-11.5~~	~~25.4/14.0-12.7~~	~~156/86-78~~	~~Baldor~~
	~~3~~	~~56C~~	~~1.15~~	~~208-230/460~~	~~85.5~~	~~F~~	~~G~~	~~5.7-5.4/2.7~~	~~6.55-6.1/3.05~~	~~46.2-48.6/24.3~~	~~ML~~
~~3~~	~~1~~	~~182TC~~	~~1.15~~	~~115/208-230~~	~~75~~	~~F~~	~~H~~	~~29/16-14.5~~	~~31.8/18-15.9~~	~~170/94-85~~	~~Baldor~~
	~~3~~	~~182TC~~	~~1.15~~	~~208-230/460~~	~~86.5~~	~~F~~	~~M~~	~~8.35-7.50/3.75~~	~~9.10-8.15/4.10~~	~~86.8-78.0/39.0~~	~~ML~~
5	~~1~~	~~213TCZ~~	~~1.15~~	~~208-230~~	~~80~~	~~F~~	~~J~~	~~24-22~~	~~27-25~~	~~188-170~~	~~Baldor~~
	3	182TC	1.15	208-230/460	88.5	F	L	14.1-13.1/7.29	16.2-15.0/8.4	207-193/107	ML
~~7 1/2~~	~~1~~	~~213TC~~	~~1.15~~	~~208-230~~	~~82~~	~~F~~	~~F~~	~~33.8-31~~	~~38.5-35.5~~	~~244-220~~	~~Baldor~~
	~~3~~	~~213TC~~	~~1.15~~	~~208-230/460~~	~~89.5~~	~~F~~	~~N~~	~~19.5-18.1/9.09~~	~~22.4-20.8/10.4~~	~~289-267/135~~	~~ML~~
~~10~~	~~1~~	~~213TC~~	~~1.15~~	~~230~~	~~85.5~~	~~F~~	~~F~~	~~40~~	~~46~~	~~284~~	~~Baldor~~
	~~3~~	~~215TC~~	~~1.15~~	~~208-230/460~~	~~90.2~~	~~F~~	~~K~~	~~26.5-24.6/12.4~~	~~29.0-27.0/13.6~~	~~261-243/123~~	~~ML~~
~~15~~	~~3~~	~~254TC~~	~~1.15~~	~~208-230/460~~	~~91~~	~~F~~	~~J~~	~~37.5-34/17~~	~~41.0-37.5/18.6~~	~~369-338/168~~	~~ML~~
~~20~~	~~3~~	~~254TC~~	~~1.15~~	~~208-230/460~~	~~91~~	~~F~~	~~K~~	~~50.5-46/23~~	~~55.5-50.5/25.5~~	~~450-410/207~~	~~ML~~
~~25~~	~~3~~	~~284TSC~~	~~1.15~~	~~230/460~~	~~91.7~~	~~F~~	~~J~~	~~62.0-56/28~~	~~68.0-61.5/31.0~~	~~510-462/233~~	~~ML~~
~~30~~	~~3~~	~~286TSC~~	~~1.15~~	~~230/460~~	~~91.7~~	~~F~~	~~H~~	~~74.0-67.0/33.5~~	~~81.5-73.5/37.0~~	~~595-537/271~~	~~ML~~
~~40~~	~~3~~	~~286TSC~~	~~1.15~~	~~230/460~~	~~91.7~~	~~F~~	~~G~~	~~88/44~~	~~102/51~~	~~614/307~~	~~Baldor~~
~~50~~	~~3~~	~~326TSC~~	~~1.15~~	~~230/460~~	~~93~~	~~F~~	~~G~~	~~110/55~~	~~128/64~~	~~746/393~~	~~Baldor~~
~~60~~	~~3~~	~~364TSC~~	~~1.15~~	~~230/460~~	~~93~~	~~F~~	~~G~~	~~134/67~~	~~154/77~~	~~918/459~~	~~Baldor~~
~~75~~	~~3~~	~~365TSC~~	~~1.15~~	~~230/460~~	~~93~~	~~F~~	~~G~~	~~166/83~~	~~188/94~~	~~1162/581~~	~~Baldor~~
~~100~~	~~3~~	~~405TSC~~	~~1.15~~	~~230/460~~	~~93.6~~	~~F~~	~~G~~	~~216/108~~	~~246/123~~	~~1422/711~~	~~Baldor~~

Jockey Pump Controllers

Microprocessor Based with Color Touchscreen

Product Description

ACROSS THE LINE

JOCKEY PUMP CONTROLLERS

The JOCKEY Touch - Jockey Pump Controllers operate across-the-line. Full voltage is applied to the motor for starting by the use of a single motor starter. Starting inrush current is approximately 600% of rated full load amperes.

~~WYE-DELTA (Star-Delta)~~

~~JOCKEY PUMP CONTROLLERS~~

~~When six or twelve-lead delta connected jockey pump motors are started wye (star) connected, approximately 58% of line voltage is applied to each winding. The motor develops 33% of full voltage starting torque and draws 33% of normal locked-rotor current from the line. After an adjustable time delay (during which the motor accelerates), it is reconnected for normal operation.~~

Product Features

Combination Motor Controllers

All JOCKEY Touch controllers are supplied with EATON combination motor controllers, which combine the circuit breaker and overload in one device.

Sealed Rotary Handle Mechanism

The rotary handle mechanism can be padlocked in the OFF position.

XT Power Controls

The JOCKEY Touch - Jockey Pump Controllers incorporate Eaton's XT Power Controls which are designed for the global marketplace. The XT controls carry global ratings, are small in size and are available in a wide variety of operating voltages. They are easy to install and maintain, due to their modular, plug-in design.

Universal Supply Voltage

The controllers will auto-detect three phase voltage supply from 200VAC to 600VAC, 50/60Hz and single phase from 110VAC to 240VAC, 50/60Hz, without the use of a control transformer.

NEMA 2 Enclosures

Enclosures have an oven baked powder paint finish and are supplied with NEMA 2 rating, unless otherwise ordered. ~~Available options include: NEMA 3R, 4, 4X, 12.~~

Programmable Functions

Inputs, Outputs, Timers and Virtual LED's are programmable via the touchscreen display.

Starting Methods

There are four methods of starting the controller: Auto, Hand, Remote Start and Pump Start.

Diagnostics / Statistics

Eight diagnostics and seven statistics parameters can be monitored.

Alarm Setpoints

Four alarm setpoints can be programmed from the Alarm Setpoints sub-menu.

Color Touchscreen Display

The JOCKEY Touch - Jockey Pump Controllers are supplied with a microprocessor based, color touchscreen. The touchscreen display allows the user to monitor and program functions and values.
Pressure input is provided by a 4-20mA pressure sensor.

Technical Data

ACROSS-THE-LINE (Direct On Line)

JOCKEY PUMP CONTROLLERS

Line Voltage						
200-208V	220-240V	380-415V	440-480V	550-600V	120V-1Ph	240V-1Ph
Motor Horsepower						
1/3-20Hp	1/3-20Hp	1/3-40Hp	1/3-50Hp	1/3-50Hp	1/3-2Hp	1/3-5Hp

~~WYE-DELTA (Star-Delta)~~

~~JOCKEY PUMP CONTROLLERS~~

~~Line Voltage~~				
~~200-208V~~	~~220-240V~~	~~380-415V~~	~~440-480V~~	~~550-600V~~
~~Motor Horsepower~~				
~~1/3-40Hp (0.74-29.42Kw)~~	~~1/3-40Hp (0.74-29.42Kw)~~	~~1/3-50Hp (0.74-36.78Kw)~~	~~1/3-50Hp (0.74-36.78Kw)~~	~~1/3-50Hp (0.74-36.78Kw)~~

Standards & Certification

The JOCKEY Touch - Jockey Pump Controllers meet the requirements of the latest edition of NFPA 20 as well as meeting CE mark requirements. They meet or exceed the requirements of UL 508 [Underwriters Laboratories (UL)] and are approved by [Canadian Standards Association (CSA)].

Powering Business Worldwide

Microprocessor - Color Touchscreen Display

Supply Voltage

3 phase – 200VAC to 600VAC, 50/60Hz
1 phase – 110VAC to 240VAC, 50/60Hz
True RMS measurement of 3 phase voltage inputs

Power Supply Output

Two 24VDC outputs

1	Power the pressure sensor
2	Energize the contactor coil

Ratings

NEMA 4 / 4X

Memory

Programmed settings saved in Non Volatile memory

Battery Backup

Real Time Clock kept intact during power failures

Ambient Temperature Rating

0C to 55C

Languages *

English
French
Spanish
Portuguese
Turkish

* Other languages available - consult factory for details

USB Port

Download Message History
Upload Firmware Updates

Programmable Inputs (2)

Each input can be programmed for one of seven different functions.

1	Interlock
2	Motor Overload
3	Fail to Start
4	Remote Start
5	Pump Start
6	Input = Output
7	Disabled

Programmable Outputs (2)

Each output can be programmed for one of twenty three different functions.

1	Power On	13	Overvoltage
2	Pump Run	14	Transducer Failure
3	Hand Mode	15	Motor Overload
4	Off Mode	16	Common Alarm
5	Auto Mode	17	Acceleration Timer
6	Low Pressure Alarm	18	Remote Start
7	High Pressure Alarm	19	Pump Start
8	Below Start Point	20	Interlock On
9	Phase Reversal	21	Input #1
10	Phase Failure	22	Input # 2
11	Fail to Start	23	Disabled
12	Undervoltage		

Timers (5)

Programmable Types

1	Minimum Run Timer
2	Sequential Start Timer
3	Pump Run Restart Timer
4	Acceleration Timer
5	Fail to Start Timer

Virtual LED's (2)

Programmable Functions (22)

1	Power On	12	Undervoltage
2	Pump Run	13	Overvoltage
3	Hand Mode	14	Transducer Failure
4	Off Mode	15	Motor Overload
5	Auto Mode	16	Common Alarm
6	Low Pressure Alarm	17	Remote Start
7	High Pressure Alarm	18	Pump Start
8	Below Start Point	19	Interlock On
9	Phase Reversal	20	Input #1
10	Phase Failure	21	Input # 2
11	Fail to Start	22	Disabled

Programmable Indication (5)

1	Red
2	Orange
3	Yellow
4	Green
5	Blue

Operation

Starting Methods (4)

1	Auto
2	Hand
3	Remote Start
4	Pump Start

Alarm Set Points (4)

1	Phase Reversal
2	Phase Failure
3	Over Voltage Alarm
4	Under Voltage Alarm

Message History (10K)

Messages time and date stamped

Diagnostics (8)

1	Firmware Version
2	Transducer Output
3	Transducer Current 1
4	Transducer Current 2
5	Input #1 Status
6	Input #2 Status
7	Relay #1 Status
8	Relay #2 Status
9	24VDC Output

Statistics (7)

1	Total Powered Time
2	Pump Run Total Time
3	Motor Starts
4	Minimum Voltage
5	Maximum Voltage
6	Minimum Pressure
7	Maximum Pressure

Powering Business Worldwide

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Canada
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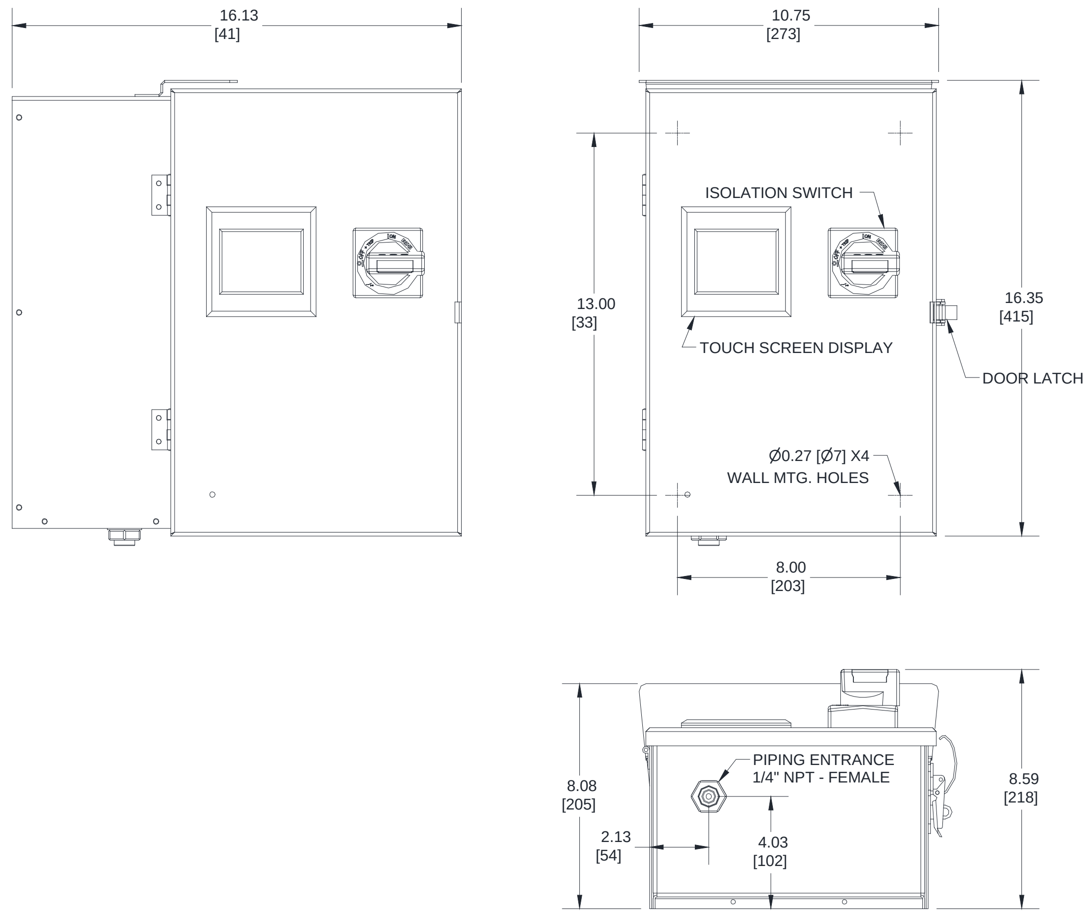
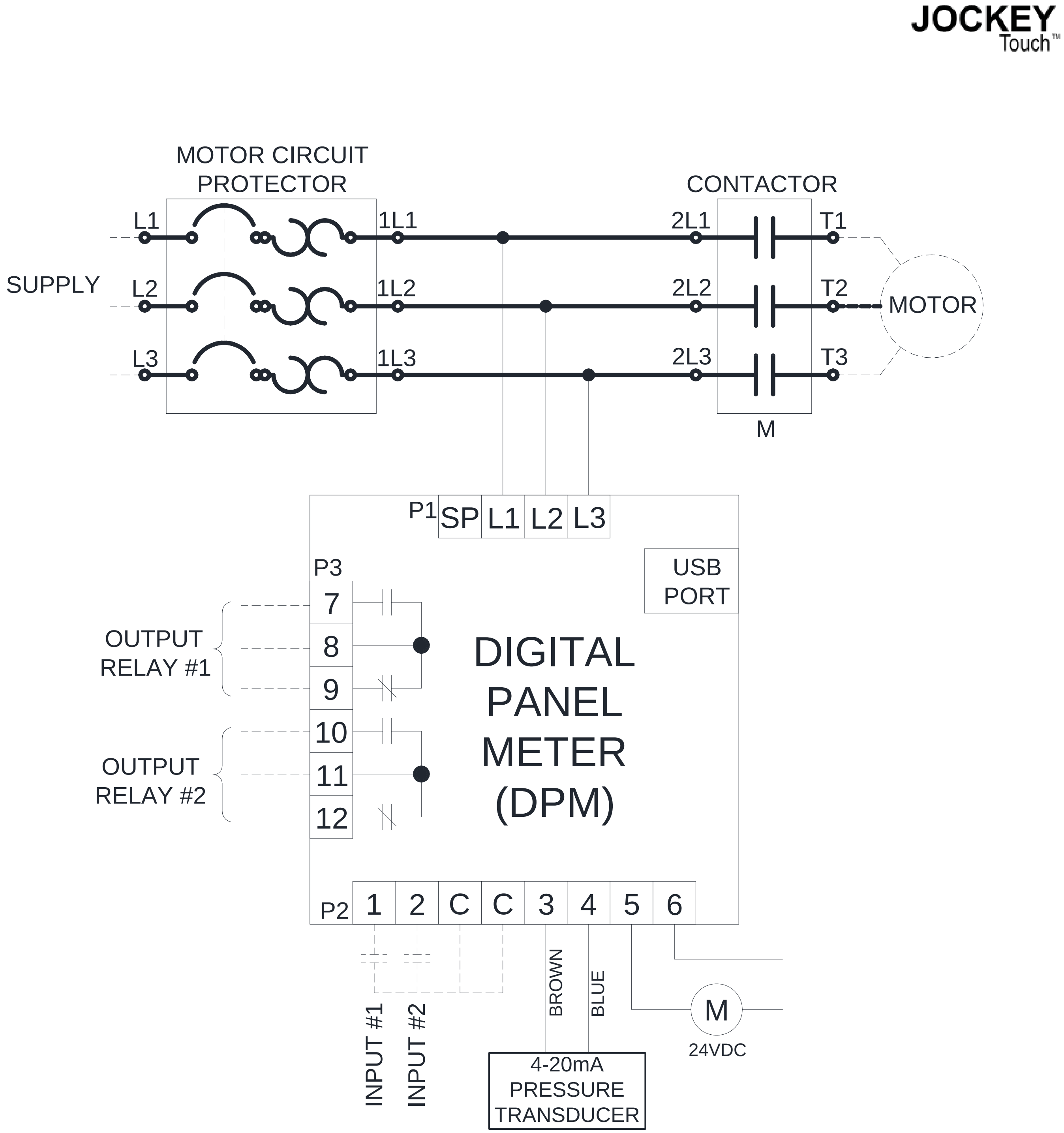
JOCKEY Touch™



200-208V		220-240V		380-415V		440-480V		550-600V	
Motor Hp	Withstand Rating (kA)	Motor Hp	Withstand Rating (kA)	Motor Hp	Withstand Rating (kA)	Motor Hp	Withstand Rating (kA)	Motor Hp	Withstand Rating (kA)
0.33 - 0.75	50	0.33 - 0.75	50	0.33 - 1.5	50	0.33 - 2	50	0.33 - 7.5	50
1 - 2	65	1 - 3	65	2 - 5	65	3 - 5	65	10 - 30	10 *
3 - 4	42	4 - 5	42	7.5	42	7.5 - 10	42		
5 - 10	18	7.5 - 10	18	10 - 15	18	15 - 20	18		

~~120V 1ph~~		~~208V 1ph~~		~~240V 1ph~~		~~Approx. Weight~~
~~Motor Hp~~	~~Withstand Rating (kA)~~	~~Motor Hp~~	~~Withstand Rating (kA)~~	~~Motor Hp~~	~~Withstand Rating (kA)~~	~~Lbs (Kg)~~
~~0.33 - 0.5~~	~~65~~	~~0.33 - 1~~	~~65~~	~~0.33~~	~~50~~	~~18 (8)~~
~~0.75 - 1~~	~~42~~	~~1.5 - 2~~	~~42~~	~~0.5 - 1.5~~	~~65~~	
~~1.5 - 2~~	~~18~~	~~3 - 4~~	~~18~~	~~2~~	~~42~~	
				~~3 - 5~~	~~18~~	

NOTES:
1. * Upstream circuit breaker required to maintain kA rating.
2. All enclosures finished in FirePump red.
3. Cable Entrance either top or bottom.
4. Standard Enclosure type NEMA 2


JOCKEY Touch™
MOTOR CIRCUIT PROTECTOR
CONTACTOR
SUPPLY
L1
L2
L3
1L1
1L2
1L3
2L1
2L2
2L3
T1
T2
T3
MOTOR
M
P1
SP
L1
L2
L3
USB PORT
P3
7
8
9
10
11
12
OUTPUT RELAY #1
OUTPUT RELAY #2
DIGITAL PANEL METER (DPM)
P2
1
2
C
C
3
4
5
6
INPUT #1
INPUT #2
BROWN
BLUE
4-20mA PRESSURE TRANSDUCER
M
24VDC

JOCKEY Touch™

XTJP
~~XTJY~~

NOTE: To select a proper part number - refer to the current Eaton Pricing Guidelines for available combinations.

Amperage Range

Three Phase

G01	0.6-1.0
G02	1.1-1.6
G03	1.7-2.5
G04	2.6-4.0
G05	4.1-6.3
G06	6.4-10.0
G07	10.1-16.0
G08	16.1-20.0
G09	20.1-25.0
G10	25.1-32.0
G11	32.1-40.0
G12	40.1-50.0
G13	50.1-65.0

Single Phase

G14	2.6-4.0
G15	4.1-6.3
G16	6.4-10.0
G17	10.1-16.0
G18	16.1-20.0
G19	20.1-25.0
G20	25.1-32.0
G21	32.1-40.0
G22	40.1-50.0
G23	50.1-65.0

Horsepower (KW) *

15	(11)
20	(15)
25	(18.6)
30	(22)
40	(30)
50	(37)

Voltage *

A =	208V - 60HZ
B =	240V - 60HZ
C =	380V - 50HZ
D =	480V - 60HZ
E =	600V - 60HZ
F =	415V - 50HZ
H =	380V - 60HZ
J =	400V - 50HZ
K =	400V - 60HZ

* NOTE: Voltage letter designations are only used when a Horsepower (KW) is selected.

Languages

L1 =	English
L2 =	French
L5 =	Spanish
L6 =	Portuguese
L11 =	Turkish

Other Languages available. Consult factory for details.

Options

C1	Extra Contacts "Pump Run"
C2	Extra Contacts "AC Power Failure"
CX	Extra Contacts (One Form-C; Specify Function)
E1	NEMA 3R - Raintight Enclosure
E2	NEMA 4 - Watertight Enclosure
E3	NEMA 12 - Industrial Dust Tight Enclosure
E5	NEMA 4X - 304 Stainless Steel Enclosure
E8	Tropicalization
E9	NEMA 4X - Painted Steel
E10	NEMA 4X - 316 Stainless Steel Enclosure
EX	Export Crating
FTS	Extra Contacts "Fail to Start"
LX	Virtual LED (Specify Description)
POL	"Power-On" Virtual LED
PRL	"Pump Run" Virtual LED
P7	Low Suction Pressure Switch & Alarm Virtual LED
P8	Low Suction Shutdown (Requires P7)
P10	Pressure Transducer - Sea Water Rated
R1	Space Heater (120 / 220V) - Externally Powered
R2	Space Heater c/w Thermostat - Externally Powered
R3	Space Heater c/w Humidistat - Externally Powered
USB	Externally Mounted USB Port

JOCKEY Touch™

XTJP / ~~XTJY~~ Jockey Pump Controllers

Typical Jockey Pump Controller Specifications

Approvals
The Jockey Pump Controller shall meet the requirements of the latest edition of NFPA 20 as well as meeting CE mark requirements. It shall meet or exceed the requirements of UL 508 [Underwriters Laboratories (UL)] standards and be approved by [Canadian Standards Association (CSA)].

Starting Type
The controller shall be Across-the-Line or ~~Wye-Delta (Star Delta~~) type designed for full voltage starting.

Ratings
The Controller shall have a minimum withstand rating of 10,000 symmetrical amperes @ [~~208V] [240V] [380V] [400V] [415V~~] [480V] [~~600V] [120V Single Phase] [240V Single Phase].~~

The horsepower rating of the controller shall not exceed 50Hp for three (3) phase units or 10Hp on single phase units.

Construction
The controller shall include a combination Circuit Breaker / Overload Motor Protector.

The motor circuit protector shall be mechanically interlocked such that the enclosure door cannot be opened when the handle is in the on position except by a tool operated defeater mechanism.

The controller manufacturer shall manufacture the contactor, motor circuit protector, touchscreen display, and enclosure. Brand-labeled components will not be accepted.

Supply Voltage
The jockey pump controller shall auto-detect three phase voltage supply from 200VAC to 600VAC, 50/60Hz and single phase from 110VAC to 240VAC, 50/60Hz, without the use of a control transformer.

Coil Voltages
The jockey pump controller shall have the following available coil voltages
120VAC 50/60 Hz or 24VDC

Enclosure
The controller shall be housed in a NEMA Type 2 (IEC IP11) drip-proof, powder baked finish, freestanding enclosure.

~~**Optional Enclosures**~~

1. ~~NEMA 3R (IEC IP14) rain-tight enclosure.~~
2. ~~NEMA 4 (IEC IP66) watertight enclosure.~~
3. ~~NEMA 4X (IEC IP66) watertight 304 stainless steel enclosure.~~
4. ~~NEMA 4X (IEC IP66) watertight 316 stainless steel enclosure.~~
5. ~~NEMA 4X (IEC IP66) watertight corrosion resistant enclosure.~~
6. ~~NEMA 12 (IEC IP52) dust-tight enclosure.~~

Languages
The controller shall be available in a variety of languages including, but not limited to:
English, French, Spanish, Portuguese, Turkish.

Touchscreen Display
The controller shall be supplied with a color touchscreen display that shall indicate the following: Supply Voltage on all phases, Current Pressure, Start Pressure and Stop Pressure.

The touchscreen display shall be supplied with a solid-state 4-20mA pressure sensor. The pressure Start and Stop points shall be adjustable in increments of one (1) PSI or 0.1 BAR.

The touchscreen display shall be a door-mount type that permits exterior programming with the controller door secured.

Options
The jockey pump controller shall have provision to be supplied with the following options:

C1 Extra Contacts " Pump Run"
C2 Extra Contacts "AC Power Failure"
CX Extra Contacts (One Form-C; Specify Function)
E1 NEMA 3R – Raintight Enclosure
E2 NEMA 4 – Watertight Enclosure
E3 NEMA 12 – Industrial Dust Tight Enclosure
E5 NEMA 4X – 304 Stainless Steel Enclosure
E8 Tropicalization
E9 NEMA 4X - Painted Steel
E10 NEMA 4X - 316 Stainless Steel Enclosure
EX Export Crating
FTS Extra Contacts "Fail to Start"
LX Virtual LED (Specify Description)
POL "Power On" Virtual LED
PRL "Pump Run" Virtual LED
P7 Low Suction Pressure Switch and Alarm Virtual LED
P8 Low Suction Shutdown (Requires P7)
P10 Pressure Transducer – Sea Water
R1 Space Heater (120 / 220V)
R2 Space Heater c/w Thermostat
R3 Space Heater c/w Humidistat

Manufacturer
The controller shall be of the XTJP Across-the-Line or ~~XTJY Wye-Delta (Star-Delta~~) type as manufactured by EATON.

LSA

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

MEMORANDUM

DATE: August 26, 2021

TO: Clayton Dragoo, Senior Project Engineer, Fisher Construction Group, Inc.

FROM: Amy Fischer, Principal
Cara Carlucci, Senior Planner

SUBJECT: Response to SBCAPCD Comments on the Air Quality Section of the Draft EIR for the Arctic Cold Storage and Packaging Project

LSA has reviewed the Santa Barbara County Air Pollution Control District (SBCAPCD) Comments on the Draft Environmental Impact Report (EIR) for the Arctic Cold Agricultural Processor and Freezer Project, 20DVP-00000-00003, 20CUP-00000-00005. This memorandum suggests specific changes to the text of the Draft EIR to address comments provided by the SBCAPCD on the Draft EIR. Where revisions to the text are called for, the page and paragraph are set forth, followed by the appropriate revision. Added text is indicated with double underlined text. Text deleted is shown in ~~strikeout~~.

Comment #2

This comment requests the mobile source emissions estimates in Section 4.3, Air Quality, of the Draft EIR be updated to align with the average daily trips (ADT) presented in the Revised Traffic and Circulation Study (Associated Transportation Engineers, July 21, 2020) which was prepared subsequent to the preparation of the air quality analysis. The revised traffic report shows an ADT of 1,642 including 396 truck trips during the peak harvest season.

To reflect the updated traffic numbers, LSA has conducted additional air quality modeling analysis. Updated model outputs are included as Attachment A to this Response to Comments The revised analysis shows that mobile source ROC emissions would exceed the Santa Barbara County mobile source emission threshold. However, per Table 4.3-4 of the Draft EIR, ROC emissions were previously identified as significant and unavoidable.

The following includes and incorporates into Section 4.3, Air Quality, of the Draft EIR a revised analysis of the proposed project's potential operational air quality impacts assuming ADT of 1,642 including 396 truck trips during the peak harvest season. Pages 4.3-7 and 4.3-8 are revised as follows:

> Long-term air pollutant emission impacts are those associated with mobile sources (e.g., vehicle trips), energy sources (e.g., electricity and natural gas), area sources (e.g.,

architectural coatings and the use of landscape maintenance equipment), off-road sources (e.g., forklifts), stationary sources (e.g., fire pumps), and boiler emissions related to the project.

Long-term operation emissions associated with the project were calculated using CalEEMod. The CalEEMod analysis assumed 449,248 square feet of "refrigerated warehouse-no rail" and a 496 space parking lot. In addition, total trip generation for the project was based on trip generation rates calculated in the project's Traffic and Circulation Study (Associated Transportation Engineers 2020, Appendix L) and fleet mix obtained from CalEEMod (Appendix C). The project would generate approximately ~~1,380~~1,642 average daily trips, with ~~1,168~~1,246 employee trips and ~~212~~396 truck trips. ~~Trip lengths in CalEEMod were also revised based on the field truck/vans trip distribution percentage, estimated origin and designation, and the estimated average one-way trip length (LSA Associates 2021). Based on the total miles traveled and the field truck/vans trip distribution percentage, the average trip length was estimated to be 24.9 miles.~~ Mobile source emissions were evaluated based on CARB's 2017 EMFAC web database using vehicle class-specific emissions factors and vehicle miles traveled. Calculation details are shown in Appendix C.

Most of the equipment used for operation of the project would be electric driven. However, the project would utilize four propane forklifts and diesel fire pumps, which were also included in CalEEMod. The analysis assumes the 351 horsepower (hp) diesel fire pump would be used 2 hours per day and up to 50 hours per year for maintenance and testing, consistent with the default operation limits for SBCACD permitting. Where project-specific data were not available, default assumptions from CalEEMod were used to estimate project emissions. The project would not add carbon dioxide to any of the operations within the facility and would not use diesel generators.

The project would also utilize five boilers to heat water for pasteurizers and evaporators for pasteurized products and puree concentrates. The five boilers would include four 100 hp Miura low-NO_X boilers and one 300 hp Miura low-NO_X boiler. All five boilers would be fueled by natural gas and would have a low NO_X rating as low as 9 parts per million. The four 100 hp Miura low-NO_X boilers would each have a heat input rating of 3,939,000 British thermal units (BTU) and the 300 hp Miura low-NO_X boiler would have a heat input rating of 11,544,000 BTU. The boilers would be used for 24 hours/6 days a week during the peak season (April through October) and 24 hours/5 days a week during the off-season (January through April). Emissions associated with the five boilers were calculated and added to the project operation emissions.

Pages 4.3-11 through 4.3-14 are revised as follows:

Project-related long-term air emissions would occur primarily from vehicle trips associated with the project (i.e., mobile source emissions) and boiler emissions. The project would use refrigerated trucks from other regions throughout California and Baja. Project-related long-term air emissions would also occur from the use of electricity and natural gas (i.e., energy source emissions), the use of landscape equipment and from the use of consumer products (i.e., area source emissions), the use of the forklifts (off-road emissions), the use of the fire pump system (i.e., stationary source emissions) and the use of the boilers. PM_{10} emissions result from exhaust produced when a vehicle is running, tire and brake wear, and the entrainment of dust into the atmosphere from vehicles traveling on paved roadways. Entrainment of PM_{10} occurs when vehicle tires pulverize small rocks and pavement and the vehicle movement generate airborne dust. The contribution of tire and brake wear is small compared to the other sources of PM emissions. Gasoline-powered engines have small rates of particulate matter emissions compared with diesel-powered vehicles.

Following the methodology discussed above, ~~construction-related~~ operational emissions were estimated using CalEEMod. Estimated maximum operational emissions are shown in Table 4.3-4.

Table 4.3-4: Project Operation Emissions

	CO	NO_x	ROC	SO_x	PM_{10}	$PM_{2.5}$
Mobile Source Emissions	~~77.3~~126.5	~~357.6~~652.9	~~23.3~~43.2	~~0.8~~1.1	~~10.5~~18.9	~~15.0~~22.7
Energy Source Emissions	0.4	0.4	<0.1	<0.1	<0.1	<0.1
Area Source Emissions	0.1	<0.1	12.6	<0.1	<0.1	<0.1
Off-road Emissions	13.8	12.7	1.4	<0.1	0.2	0.8
Stationary Source Emissions	3.0	3.2	1.2	<0.1	4.9	0.2
Boiler Emissions	194.6	7.2	3.5	~~43.1~~9.0	<0.1	<0.1
Total Project Operation Emissions	**~~289.2~~338.4**	**~~381.1~~676.4**	**~~42.0~~61.9**	**~~9.8~~10.1**	**~~16.4~~24.8**	**~~16.0~~23.7**
Santa Barbara County Mobile Source Significance Threshold	N/A	25.0	25.0	N/A	N/A	N/A
Mobile Source Threshold Exceeded?	**N/A**	**Yes**	**~~No~~Yes**	**N/A**	**No**	**N/A**
Santa Barbara County All Source Significance Threshold	N/A		240.0	N/A	80	N/A
All Source Threshold Exceeded?	**N/A**		**Yes**	**N/A**	**No**	**N/A**

Source: LSA Associates 2021 (Appendix C).

As shown in Table 4.3-4, mobile source emissions associated with the project would exceed the applicable Santa Barbara County threshold for mobile NO_X and ROC emissions. The project's total emissions of ROC and NO_X would exceed the Santa Barbara County threshold for ROC and NO_X combined, primarily as a result of the project's high emissions of NO_X and ROC from mobile sources.

Mitigation Measures

AQ-1 NO_X Emissions Reduction Measures

The applicant shall implement the following NO_X and ROC emission reduction measures:

a. Provide the necessary infrastructure to support zero-emission vehicles and equipment that will be operating on site.

b. All loading/unloading docks and trailer spaces shall be equipped with electrical hookups for trucks with transport refrigeration units (TRU) or auxiliary power units. This requirement decreases the amount of time that a TRU powered by a fossil-fueled internal combustion engine can operate at the project site. Use of zero-emission all-electric plug-in TRUs, hydrogen fuel cell transport refrigeration, and cryogenic transport refrigeration shall be encouraged for operational fleets to the maximum extent feasible.

c. All TRUs entering the project site be shall plug-in capable.

d. All heavy-duty trucks entering or on the project site shall be model year 2014 or later to the maximum extent feasible. Operational fleets shall use zero-emission light and medium-duty delivery trucks and vans to the maximum extent feasible. The applicant shall expedite a transition to zero-emission vehicles, with all operational fleets being fully zero-emission beginning in 2030.

e. On-site TRU diesel engine runtime shall be limited to no longer than 15 minutes.

f. Include rooftop solar panels to the maximum extent feasible, with a capacity that matches the maximum allowed for distributed solar connections to the grid.

Plan Requirements and Timing. The Conditional Use Permit shall require that the applicant report operational characteristics to Planning and Development staff annually, with the initial report due three months after initial project operation. Annual reports shall demonstrate to the satisfaction of the Planning and Development staff that improvements required by measures C through H are being implemented on an on-going basis.

If the project applicant applies for a stationary source air permit from the SBCAPCD, the applicant shall demonstrate to the satisfaction of Planning and Development staff that measures C through H are incorporated into the air quality permit requirements. Upon issuance of the air quality permit, implementation monitoring of these measures may be transferred to SBCAPCD staff to streamline enforcement.

Monitoring. Planning and Development compliance monitoring staff shall incorporate these NO_X and ROC emission reduction measures into the project Conditional Use Permit. Prior to issuance of the Conditional Use Permit, the applicant shall demonstrate to the satisfaction of the Planning and Development staff that improvements required by measures (a, b, and i) have been constructed.

Significance After Mitigation

Implementation of Mitigation Measure AQ-1 would reduce mobile source NO_X and ROC emissions to the extent feasible by providing infrastructure necessary to support zero-emission vehicles and equipment. The project can provide infrastructure to support zero-emission vehicles and equipment; however incoming produce would be transported by trucks owned by local growers and growers from other regions and Baja. The project applicant would have limited control of the composition of truck fleets, and it would not be feasible for the project applicant or County to require other parties to upgrade truck fleets to incorporate zero or near-zero emissions technologies as mitigation for the proposed project. Due to the project's limited control over other parties' truck fleets, the project could not feasibly reduce mobile source emissions by 90 percent, the amount required to reduce the project's NO_X and ROC emissions below the applicable mobile source NO_X and ROC threshold. As a result, the potential impact of the project's operational emissions of NO_X and ROC would be significant and unavoidable.

ROC and NO_X emissions associated with the project would be regional in nature, meaning that the air pollutants are rapidly dispersed on release or, in the case of vehicle emissions associated with the project; emissions are released in other areas of the SCCAB (i.e., vehicles traveling to the project site would release emissions along roadways throughout the SCCAB and not specifically on the project site). Although operational emissions exceed the Santa Barbara County's operational mobile significance threshold for NO_X and ROC, it is speculative to estimate the concentration of ozone that would be created at or near the project site on a particular day or month of the year, or the specific human health impacts that may occur. Meteorology, the presence of sunlight and other complex chemical factors all combine to determine the ultimate concentrations and locations of ozone. This is especially true for the project, where most of the criteria pollutant emissions derive not from a single "point source," but from mobile sources (cars and trucks) driving to, from, and around the project site.

In addition, it is speculative to estimate the impact of the estimated NO_X and ROC emissions on NAAQS attainment. As discussed above, the currently available tools are equipped to model the impact of all emission sources in the air basin on attainment. According to the SBCAPCD's 2019 Ozone Plan, basin-wide emissions in 2012 were 71.6 tons per day for NO_X emissions (SBCAPCD 2019). Running the photochemical grid model used for predicting ozone attainment with the emissions solely from project (which equates to less than one tenth of one percent for NO_X) is not likely to yield pertinent information given the relatively small scale involved. It is not scientifically feasible at the time of drafting of this report to substantively connect this individual project's air quality impacts to likely health consequences so that the public may make informed decisions regarding the costs and benefits of the project. Mitigation Measure AQ-1 would reduce mobile source NO_X emissions to the extent feasible; however, for the reasons describe above the potential impact of the project's operational emissions of NO_X and ROC would remain significant and unavoidable.

Comment #6

This comment requests the Health Risk Assessment (HRA) be updated as follows: include receptors along the property boundary, including the agricultural fields; use a flagpole height of 1.5 meters for all receptors; use the actual engine stack parameters including the engine's exhaust flow rate is 1878 cfm, the temperature is 816 °F, and the stack diameter is 6 inches; use a worker adjustment factor of 4.2; and calculate the risk using HARP2.

LSA conducted an updated analysis with the model adjustments as suggested. Results of the analysis are shown in the revised Table 4.3-5. Revisions to the model input did not result a change in the conclusions of the analysis. Updated model snapshots are included as Attachment B to this Response to Comments. Table 4.3-5 of Section 4.3, Air Quality, of the Draft EIR is revised as follows:

Table 4.3-5: Health Risk from Diesel Fire Pump to Nearest Receptor

	Carcinogenic Inhalation Health Risk in One Million[1]	Chronic Inhalation Hazard Index[2]
Maximally Exposed Individual Resident	0.5	<0.1
Maximally Exposed Individual Worker	~~0.3~~0.6	<0.1
SBCAPCD Significance Threshold	10.0	1.0
Exceed Threshold?	**No**	**No**

[1] Represents the probability that an exposed individual will develop cancer (persons per million exposed).

[2] Hazard Index (HI) is a relative metric for the effect of substances on an organ or organ system. A hazard index of less than 1.0 will not likely result in health effects over lifetime exposure. A hazard index greater than 1.0 does not necessarily suggest adverse health effects are likely and is best described as indicating that there is potential for adverse irritation to an organ or organ system.

Source: LSA Associates 2021 (Appendix C).

Attachments: A: Revised Mobile Source Emissions Estimates
B: Revised HRA Model Snapshots

LSA

ATTACHMENT A
MOBILE SOURCE EMISSIONS ESTIMATES

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Peak Harvest Season Trucks					
Building Area & Use	**Truck Type**	**Trucks Per Day**	**ADT**	**AM Peak (6-7 AM)**	**PM Peak (5-6 PM)**
Warehouse	Semi-Trucks(a)	30	60	3	4
Processing	Semi-Trucks(a)	30	60	6	6
	Field Trucks(a)	46	276	28	28
Subtotal		76	336	34	34
Total Trucks		*106*	*396*	*37*	*38*

(a) ADT assumes 1 inbound + 1 outbound trip per truck. Peak hour trips based on operational data for arrival and departure times.

Field Truck/Vans Trip Distribution %			**Estimated Origin/ Destination**	**Estimated Average One-Way Trip Length**
US 101	North	50%	SLO & Monterey Counties (a)	150 Miles
	South	25%	SB County	40 Miles
Betteravia Rd	East	10%	Local	10 Miles
	West	15%	Local	5 Miles
Warehouse Truck Trip Distribution %			**Estimated Origin/Destination**	**Estimated Average One-Way Trip Length**
US 101	North	50%	Northern California (b)	300 Miles
	South	50%	Southern California/Baja (c)	150 Miles

(a) Assumes 20% from SLO County and 30% from Monterey County

(b) Assumes median trip length between Project site and Crescent City

(c) Assumes median trip length between Project site and Tijuana

Total VMT		**ADT**	% Distrubution		Miles	Total VMT	
Warehouse	Semi-Trucks	60	North	50%	300	9000	150
			South	50%	150	4500	75
Processing	Semi-Trucks and Field Trucks	336	North	50%	150	25200	75
			South	25%	40	3360	10
			East	10%	10	336	1
			West	15%	5	252	0.75
Employees	Cars	1246		100%	6.6	8223.6	6.6
Total Miles						50872	
Average Trip Length (total miles/ADT)						36.86347826	

Fleet Mix		**Vehicle Class**	**ADT**	**% of ADT**		
Employees	Cars	LDA	1246	50%	623	0.379415347
		LDT1		25%	311.5	0.189707674
		LDT2		25%	311.5	0.189707674
Warehouse	Semi-Trucks	T7 Tractor Construction	60	100%	60	0.036540804
Processing	Semi-Trucks	MDV	60	100%	60	0.036540804
	Field Trucks	T6 Ag	276	100%	276	0.168087698
Total Trips					1642	

Non-Harvest Season Trucks					
Building Area & Use	Truck Type	Trucks Per Day	ADT	AM Peak (6-7 AM)	PM Peak (5-6 PM)
Warehouse	Semi-Trucks(a)	30	60	3	4
Processing	Semi-Trucks(a)	8	16	2	2
	Field Trucks(a)	12	72	7	7
Subtotal		20	88	9	9
Total Trucks			*148*	*12*	*13*

(a) ADT assumes 1 inbound + 1 outbound trip per truck. Peak hour trips based on operational data for arrival and departure times.

Field Truck/Vans Trip Distribution %			Estimated Origin/ Destination	Estimated Average One-Way Trip Length
US 101	North	50%	SLO & Monterey Counties (a)	150 Miles
	South	25%	SB County	40 Miles
Betteravia Rd	East	10%	Local	10 Miles
	West	15%	Local	5 Miles
Warehouse Truck Trip Distribution %			**Estimated Origin/Destination**	**Estimated Average One-Way Trip Length**
US 101	North	50%	Northern California (b)	300 Miles
	South	50%	Southern California/Baja (c)	150 Miles

(a) Assumes 20% from SLO County and 30% from Monterey County

(b) Assumes median trip length between Project site and Crescent City

(c) Assumes median trip length between Project site and Tijuana

Total VMT		ADT	% Distrubution		Miles	Total VMT
Warehouse	Semi-Trucks	60	North	50%	300	9000
			South	50%	150	4500
Processing	Semi-Trucks and Field Trucks	88	North	50%	150	6600
			South	25%	40	880
			East	10%	10	88
			West	15%	5	66
Employees	Cars	306		100%	6.6	2019.6
Total Miles						23154
Average Trip Length (total miles/ADT)						16.77797

Fleet Mix		Vehicle Class	ADT	% of ADT		
Employees	Cars	LDA	306	50%	153	0.337004
		LDT1		25%	76.5	0.168502
		LDT2		25%	76.5	0.168502
Warehouse	Semi-Trucks	T7 Tractor Construction	60	100%	60	0.132159
Processing	Semi-Trucks	MDV	16	100%	16	0.035242
	Field Trucks	T6 Ag	72	100%	72	0.15859
Total Trips					454	

Non-Harvest

Fleet Mix		Vehicle Class	ADT	% of ADT			ADT	% of ADT		
Employees	Cars	LDA	306	0.5	153	0.369792	697.6667	0.5	348.8333	0.36758
		LDT1		0.25	76.5	0.184896		0.25	174.4167	0.18379
		LDT2		0.25	76.5	0.184896		0.25	174.4167	0.18379
Warehouse	Semi-Trucks	T7 Tractor Construction	60	1	60	0.15625	60	1	60	0.063224
Processing	Semi-Trucks	MDV	16	1	16	0.052083	34.33333	1	34.33333	0.036178
	Field Trucks	T6 Ag	72	1	72	0.052083	157	1	157	0.165437
Total Trips					454					
							949		949	

Harvest

Fleet Mix		Vehicle Class	ADT	% of ADT		
Employees	Cars	LDA	1246	0.5	623	0.423188
		LDT1		0.25	311.5	0.211594
		LDT2		0.25	311.5	0.211594
Warehouse	Semi-Trucks	T7 Tractor Construction	60	1	60	0.043478
Processing	Semi-Trucks	MDV	60	1	60	0.075362
	Field Trucks	T6 Ag	276	1	276	0.034783
Total Trips					1642	

										Lbs/Day									MT/Day		
Process	**Vehicle Type**	**Miles/Trip**	**# Vehicles**	**EMFAC 2011**	**ADT**	**% by Type**	**Fuel Type**	**% by Fuel Type**	**Total Miles**	**NOx**	**PM2.5**	**PM2.5 (TW/BW)**	**PM10**	**PM10 (TW/BW)**	**ROG**	**TOG**	**CO**	**SOx**	**CO_2**	**CH_4**	**N_2O**
Warehouse	Semi-Trucks	225.0	30	T7 Tractor Construction	60	100%	GAS	0%	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00E+00	0.00
							DSL	100%	13,500	173.91	1.35	1.06	1.42	2.91	6.41	7.30	26.61	0.52	24.76	1.35E-04	0.00
							NG	0%	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00E+00	0.00
							ELEC														
Processing	Semi-Trucks and Field Trucks	86.8	30	MDV	60	100%	GAS	0%	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00E+00	0.00
							DSL	100%	5,205	0.65	0.06	0.20	0.06	0.51	0.12	0.14	2.11	0.04	1.87	2.62E-06	0.00
							NG														
							ELEC	0%	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00E+00	0.00
			46	T6 Ag	276	100%	GAS	0%	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00E+00	0.00
							DSL	100%	23,943	474.35	16.43	3.11	17.17	7.51	31.46	35.82	76.59	0.54	25.85	6.63E-04	0.00
							NG	0%	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00E+00	0.00
							ELEC														
Employees	Cars	6.6	623	LDA	1246	50%	GAS	50%	2,056	0.52	0.01	0.08	0.01	0.20	1.12	1.18	6.37	0.01	0.56	4.39E-05	0.00
							DSL	25%	1,028	0.23	0.02	0.04	0.02	0.10	0.03	0.04	0.47	0.00	0.21	7.05E-07	0.00
							NG														
							ELEC	25%	1,028	0.00	0.00	0.04	0.00	0.10	0.01	0.01	0.00	0.00	0.00	0.00E+00	0.00
				LDT1		25%	GAS	50%	1,028	0.54	0.01	0.04	0.01	0.10	1.68	1.74	5.58	0.01	0.35	4.77E-05	0.00
							DSL	25%	514	1.70	0.18	0.02	0.19	0.05	0.24	0.31	1.53	0.00	0.21	5.02E-06	0.00
							NG														
							ELEC	0%	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00E+00	0.00
				LDT2		25%	GAS	50%	1,028	0.90	0.01	0.04	0.01	0.10	2.12	2.21	7.08	0.01	0.39	6.59E-05	0.00
							DSL	25%	514	0.06	0.01	0.02	0.01	0.05	0.02	0.02	0.14	0.00	0.14	3.32E-07	0.00
							NG														
							ELEC	25%	514	0.00	0.00	0.02	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00E+00	0.00
									Total	652.86	18.06	4.67	18.88	11.70	43.23	48.77	126.48	1.13	54.34	9.64E-04	0.01
											PM 2.5 Total	22.73	PM 10 Total	30.58						0.024107133	2.51092
																			10573.6	3.78E+00	487.088
																			CO2e Total	11064.46709	

										Lbs/Day									MT/Day		
Process	**Vehicle Type**	**Miles/Trip**	**# Vehicles**	**EMFAC 2011**	**ADT**	**% by Type**	**Fuel Type**	**% by Fuel Type**	**Total Miles**	**NOx**	**PM2.5**	**PM2.5 (TW/BW)**	**PM10**	**PM10 (TW/BW)**	**ROG**	**TOG**	**CO**	**SOx**	**CO_2**	**CH_4**	**N_2O**
Warehouse	Semi-Trucks	**225.0**	30	T7 Tractor Construction	**60**	**100%**	GAS	**0%**	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00E+00	0.00
							DSL	**100%**	13,500	173.91	1.35	1.06	1.42	2.91	6.41	7.30	26.61	0.52	24.76	1.35E-04	0.00
							NG	**0%**	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00E+00	0.00
							ELEC														
Processing	Vans and Field Trucks	**86.8**	8	MDV	**16**	**100%**	GAS	**0%**	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00E+00	0.00
							DSL	**100%**	1,388	0.17	0.02	0.05	0.02	0.14	0.03	0.04	0.56	0.01	0.50	6.98E-07	0.00
							NG														
							ELEC	**0%**	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00E+00	0.00
			12	T6 Ag	**72**	**100%**	GAS	**0%**	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00E+00	0.00
							DSL	**100%**	6,246	123.74	4.29	0.81	4.48	1.96	8.21	9.34	19.98	0.14	6.74	1.73E-04	0.00
							NG	**0%**	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00E+00	0.00
							ELEC														
Employees	Cars	**6.6**	153	LDA	**306**	**50%**	GAS	**50%**	505	0.13	0.00	0.02	0.00	0.05	0.28	0.29	1.57	0.00	0.14	1.08E-05	0.00
							DSL	**25%**	252	0.06	0.00	0.01	0.00	0.02	0.01	0.01	0.12	0.00	0.05	1.73E-07	0.00
							NG														
							ELEC	**25%**	252	0.00	0.00	0.01	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00E+00	0.00
				LDT1		**25%**	GAS	**50%**	252	0.13	0.00	0.01	0.00	0.02	0.41	0.43	1.37	0.00	0.09	1.17E-05	0.00
							DSL	**25%**	126	0.42	0.04	0.00	0.05	0.01	0.06	0.08	0.38	0.00	0.05	1.23E-06	0.00
							NG														
							ELEC	**25%**	126	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00E+00	0.00
				LDT2		**25%**	GAS	**50%**	252	0.22	0.00	0.01	0.00	0.02	0.52	0.54	1.74	0.00	0.10	1.62E-05	0.00
							DSL	**25%**	126	0.01	0.00	0.00	0.00	0.01	0.00	0.00	0.03	0.00	0.03	8.14E-08	0.00
							NG														
							ELEC	**25%**	126	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00E+00	0.00
									Total	298.80	5.71	2.00	5.97	5.21	15.94	18.04	52.35	0.68	32.46	3.49E-04	0.01
											PM 2.5 Total	7.71	PM 10 Total	11.17						8.72E-03	1.512064

Source: EMFAC2017 (v1.0.3) Emission Rates
Region Type: County
Region: Santa Barbara
Calendar Year: 2022
Season: Annual
Vehicle Classification: EMFAC2011 Categories
Units: miles/day for VMT, trips/day for Trips, g/mile for RUNEX, PMBW and PMTW, g/trip for STREX, HOTSOAK and RUNLOSS, g/vehicle/day for IDLEX, RESTLOSS and DIURN

Region	Calendar	Vehicle Category	Model Ye	Speed	Fuel	Populatio	VMT	Trips	NOx_RUNEX	NOx_IDLEX	NOx_STREX	PM2.5_RUNEX	PM2.5_IDLEX	PM2.5_STREX	PM2.5_PMTW	PM2.5_PMBW	PM10_RUNEX	PM10_IDLEX	PM10_STREX	PM10_PMTW	PM10_PMBW	CO2_RUNEX	CO2_IDLEX	CO2_STREX	CH4_RUNEX	CH4_IDLEX	CH4_STREX	N2O_RUNEX	N2O_IDLEX	N2O_STREX	ROG_RUNEX	ROG_IDLEX	ROG_STREX	ROG_HOTSOAK	ROG_RUNLOSS	ROG_RESTLOSS	ROG_DIURN	TOG_RUNEX	TOG_IDLEX	TOG_STREX	TOG_HOTSOAK	TOG_RUNLOSS	TOG_RESTLOSS	TOG_DIURN	CO_RUNEX	CO_IDLEX	CO_STREX	SOx_RUNEX	SOx_IDLEX	SOx_STREX
SANTA BARBARA	2020	HHDT	Aggregate	Aggregate	GAS																																													
Santa Barbara	2022	T7 tractor construct	Aggregate	Aggregate	Diesel	103.9243	7168.959	469.8376	5.777789187	21.80301479	3.87150825	0.045505225	0.010064356	0	0.009000003	0.026460008	0.04756277	0.010519421	0	0.03600001	0.061740018	1824.97875	4185.390728	0	0.009846335	0.073939328	0	0.286861245	0.657885137	0	0.211988886	1.591893451	0	0	0	0	0	0.24133321	1.812249517	0	0	0	0	0	0.84703857	21.21152301	0	0.017241494	0.039541496	0
SANTA BARBARA	2020	HHDT	Aggregate	Aggregate	NG																																													
Santa Barbara	2022	T6 Ag	Aggregate	Aggregate	Diesel	23.80174	255.0726	104.7277	8.959867195	9.835399693	0.668613654	0.310937813	0.137159435	0	0.003000001	0.055860016	0.324997042	0.143361176	0	0.012000003	0.130340037	1078.427653	663.5833262	0	0.027646953	0.019774635	0	0.169513809	0.104306058	0	0.595231325	0.425742468	0	0	0	0	0	0.677625553	0.484675392	0	0	0	0	0	1.44426552	3.480855771	0	0.01018845	0.006269206	0
Santa Barbara	2022	LDA	Aggregate	Aggregate	Gasoline	156319.5	5603761	727641.1	0.047727167	0	0.220704899	0.001218173	0	0.001869196	0.002000001	0.015750005	0.001324852	0	0.002032816	0.008000002	0.036750011	255.5781023	0	56.65191605	0.002612815	0	0.061907236	0.005011793	0	0.028262172	0.010475591	0	0.289299868	0.127875792	0.25376001	0.221392842	0.229641893	0.015279095	0	0.31674503	0.127875792	0.25376001	0.221392842	0.229641893	0.661404662	0	2.457309691	0.002529153	0	0.000560617
Santa Barbara	2022	LDA	Aggregate	Aggregate	Diesel	2193.939	78720.03	10173.29	0.102715837	0	0	0.007866554	0	0	0.002000001	0.015750005	0.008222245	0	0	0.008000002	0.036750011	201.1239969	0	0	0.000685755	0	0	0.031613891	0	0	0.014763898	0	0	0	0	0	0	0.016807717	0	0	0	0	0	0	0.208473354	0	0	0.001901345	0	0
Santa Barbara	2022	LDA	Aggregate	Aggregate	Electricity	2756.14	112939.8	13707.6	0	0	0	0	0	0	0.002000001	0.015750005	0	0	0	0.008000002	0.036750011	0	0	0	0	0	0	0	0	0	0	0	0	0.004888026	0	0.003124904	0.012334728	0	0	0	0.004888026	0	0.003124904	0.012334728	0	0	0	0	0	0
Santa Barbara	2022	LDT1	Aggregate	Aggregate	Gasoline	17029.6	591852.1	78355.28	0.081675373	0	0.259598885	0.001482849	0	0.002156779	0.002000001	0.015750005	0.00161267	0	0.002345562	0.008000002	0.036750011	297.3743929	0	65.88092347	0.003844521	0	0.070286891	0.006800738	0	0.030097715	0.016195442	0	0.338064044	0.170087961	0.610020958	0.313406972	0.335666514	0.023618944	0	0.370135978	0.170087961	0.610020958	0.313406972	0.335666514	0.900301269	0	2.57925585	0.002942761	0	0.000651945
Santa Barbara	2022	LDT1	Aggregate	Aggregate	Diesel	20.08755	316.4537	64.16141	1.498354416	0	0	0.158685573	0	0	0.002000001	0.015750005	0.165860631	0	0	0.008000002	0.036750011	411.3794019	0	0	0.009768788	0	0	0.064663113	0	0	0.210316248	0	0	0	0	0	0	0.239431066	0	0	0	0	0	0	1.353058131	0	0	0.003889015	0	0
Santa Barbara	2022	LDT1	Aggregate	Aggregate	Electricity	107.6368	4277.413	526.7953	0	0	0	0	0	0	0.002000001	0.015750005	0	0	0	0.008000002	0.036750011	0	0	0	0	0	0	0	0	0	0	0	0	0.004888026	0	0.003124904	0.012334728	0	0	0	0.004888026	0	0.003124904	0.012334728	0	0	0	0	0	0
Santa Barbara	2022	LDT2	Aggregate	Aggregate	Gasoline	67983.46	2269109	308336.2	0.143282816	0	0.418333752	0.001429219	0	0.002064629	0.002000001	0.015750005	0.001554332	0	0.00224532	0.008000002	0.036750011	332.8423283	0	75.5744531	0.005582782	0	0.096609504	0.009832942	0	0.039360638	0.024458216	0	0.488533955	0.203737987	0.709452151	0.400982461	0.410101267	0.035670803	0	0.534881037	0.203737987	0.709452151	0.400982461	0.410101267	1.168587973	0	3.224007337	0.003293745	0	0.00074787
Santa Barbara	2022	LDT2	Aggregate	Aggregate	Diesel	463.905	18212.01	2244.188	0.053709765	0	0	0.005722319	0	0	0.002000001	0.015750005	0.005981057	0	0	0.008000002	0.036750011	272.2647886	0	0	0.000645045	0	0	0.042796233	0	0	0.01388744	0	0	0	0	0	0	0.015809927	0	0	0	0	0	0	0.121887781	0	0	0.002573881	0	0
Santa Barbara	2022	LDT2	Aggregate	Aggregate	Electricity	468.5996	15414.64	2361.987	0	0	0	0	0	0	0.002000001	0.015750005	0	0	0	0.008000002	0.036750011	0	0	0	0	0	0	0	0	0	0	0	0	0.004888026	0	0.003124904	0.012334728	0	0	0	0.004888026	0	0.003124904	0.012334728	0	0	0	0	0	0
Santa Barbara	2022	MDV	Aggregate	Aggregate	Gasoline	49925.91	1649802	225363.9	0.127443886	0	0.4492665	0.001303143	0	0.002025083	0.002000001	0.015750005	0.001417098	0	0.002202001	0.008000002	0.036750011	403.9389627	0	91.65994316	0.005224583	0	0.10497869	0.009550627	0	0.041199232	0.022383297	0	0.536290307	0.188378207	0.59840535	0.394091083	0.367184391	0.03259824	0	0.587161888	0.188378207	0.59840535	0.394091083	0.367184391	1.065774588	0	3.80532595	0.003997303	0	0.000907049
Santa Barbara	2022	MDV	Aggregate	Aggregate	Diesel	1160.091	45204.32	5569.082	0.057065976	0	0	0.005048978	0	0	0.002000001	0.015750005	0.00527727	0	0	0.008000002	0.036750011	359.4228466	0	0	0.000502682	0	0	0.056496266	0	0	0.010822445	0	0	0	0	0	0	0.012320634	0	0	0	0	0	0	0.183509811	0	0	0.003397838	0	0
Santa Barbara	2022	MDV	Aggregate	Aggregate	Electricity	228.9779	7747.384	1163.262	0	0	0	0	0	0	0.002000001	0.015750005	0	0	0	0.008000002	0.036750011	0	0	0	0	0	0	0	0	0	0	0	0	0.004888026	0	0.003124904	0.012334728	0	0	0	0.004888026	0	0.003124904	0.012334728	0	0	0	0	0	0
Santa Barbara	2022	MH	Aggregate	Aggregate	Gasoline	1115.529	9093.687	111.5975	0.602774654	0	0.334927093	0.001882	0	0.000397014	0.003000001	0.055860016	0.002046846	0	0.000431789	0.012000003	0.130340037	1803.992488	0	26.71967083	0.022320277	0	0.033519855	0.033202107	0	0.033304285	0.104066526	0	0.146681058	0.10945034	2.912396881	0.048486416	0.114926857	0.151853631	0	0.160597295	0.10945034	2.912396881	0.048486416	0.114926857	2.840713442	0	3.241571422	0.017851968	0	0.000264413
Santa Barbara	2022	MH	Aggregate	Aggregate	Diesel	374.7128	3361.328	37.47128	4.705957747	0	0	0.114627621	0	0	0.004000001	0.055860016	0.119810573	0	0	0.016000005	0.130340037	1037.879131	0	0	0.005570016	0	0	0.163140146	0	0	0.119919165	0	0	0	0	0	0	0.136519997	0	0	0	0	0	0	0.438488874	0	0	0.00981169	0	0

ATTACHMENT B

HRA MODEL SNAPSHOTS

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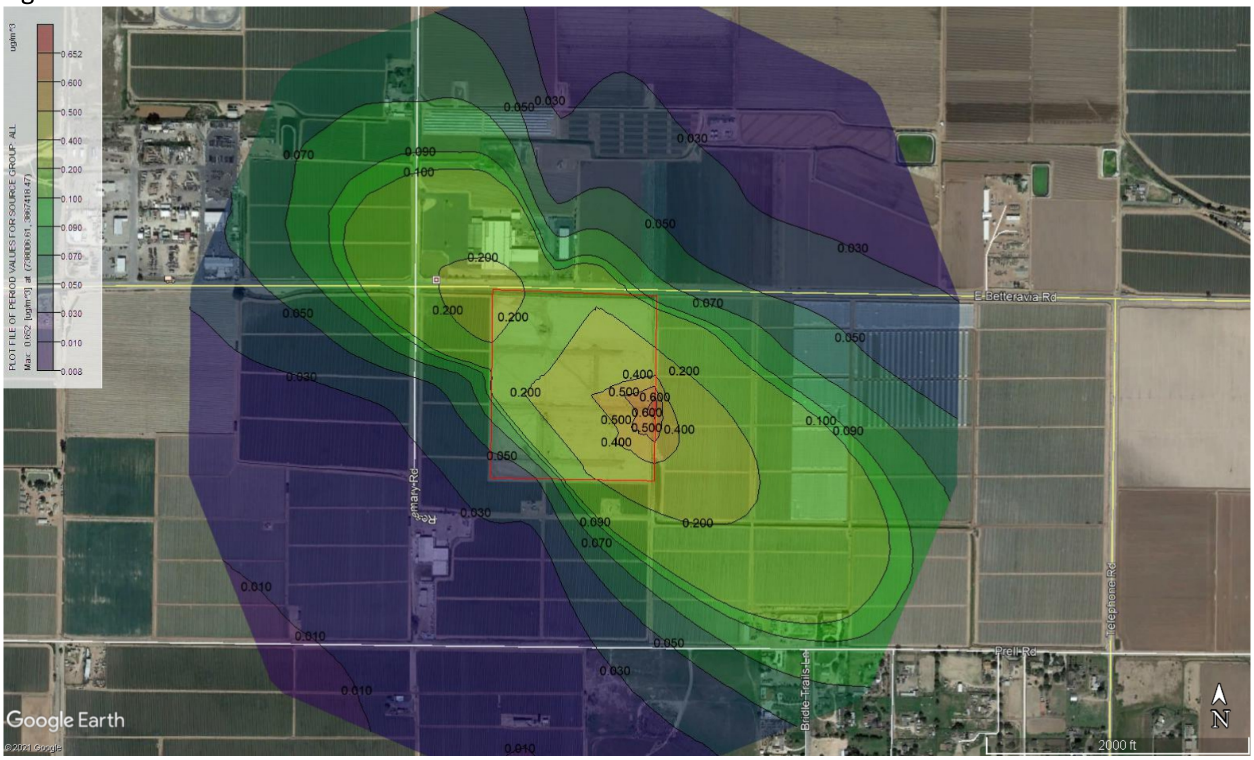
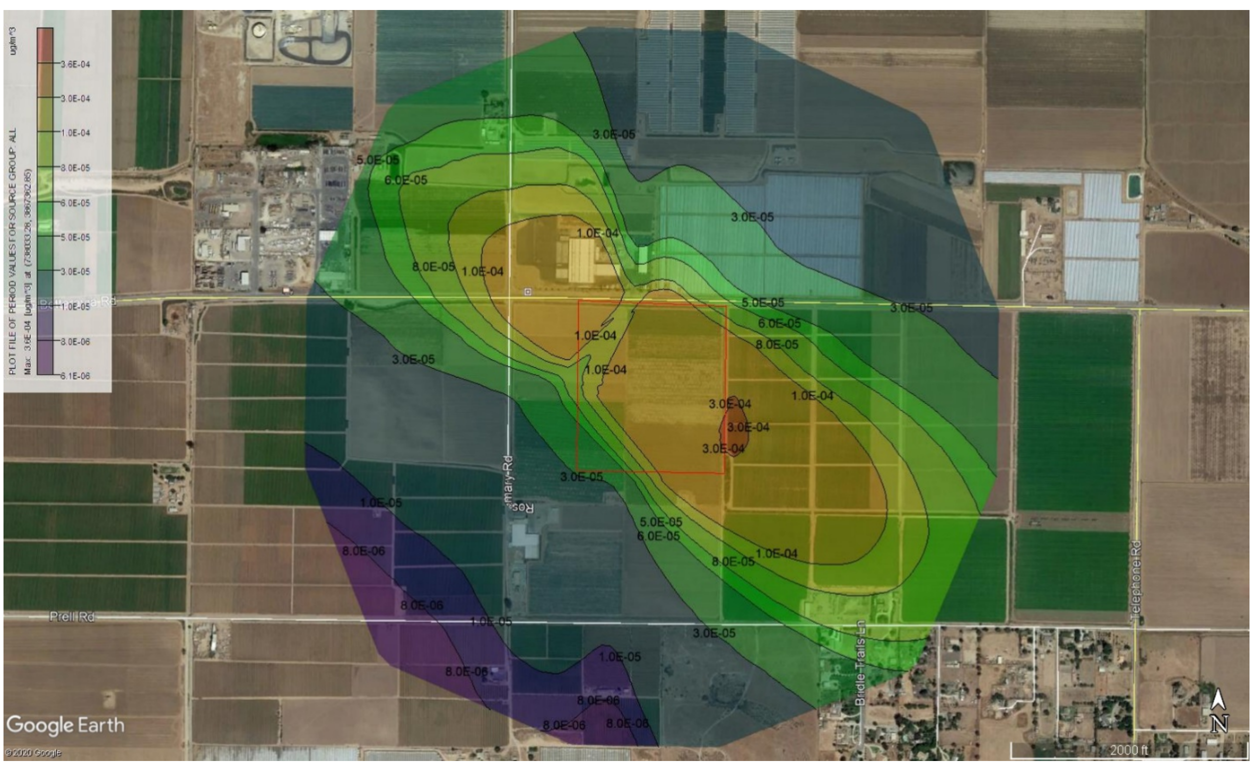
Agricultural Worker Cancer Risk



Agricultural Worker Chronic Hazard Index



$$WAF_{cancer} = \frac{H_{residential}}{H_{source}} * \frac{D_{residential}}{D_{source}} * DF$$

WAF8-hour = 3

where:

	WAF8-hour =	the worker adjustment factor for the 8-hour HI (although it is called the worker adjustment factor, the WAF should also be applied when calculating the 8-hour HI for residential and sensitive receptors, for a non-continuous facility)
24	Hresidential =	the number of hours per day on which the long-term residential concentration is based = 24 hours
1	Hsource =	the number of hours per day that the source operates
7	Dresidential =	the number of days per week on which the long-term residential concentration is based = 7 days
1	Dsource =	the number of days per week that the source operates
0.018	DF =	the discount factor

$$DF = \frac{H_{coincident}}{H_{worker}} * \frac{D_{coincident}}{D_{worker}}$$

0.017857143

	DF =	the discount factor
1	Hcoincident =	the number of hours per day that the offsite worker's schedule and the source's emission schedule overlap
8	Hworker =	the number of hours per day that the offsite worker works
1	Dcoincident =	the number of days per week that the offsite worker's schedule and source's emission schedule overlap
7	Dworker =	the number of days per week that the offsite worker works