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LAND USE COMMISSION

HOKUA PLACE

Kawaihau District, Kapa'a, Kaua'i, Hawai'i

TMK (4) 4-3-003:001 (por.)

Greenhouse Gas Assessment



Prepared By:

HG Kaua'i Joint Venture LLC
9911 S. 78th Avenue
Hickory Hills, IL 60457

July 2020

G7O

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Applicant:

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Submitted To:

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Land Use Commission
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July 2020



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Chapter 1

Introduction

1.1 Project Information Summary

Type of Document:	Greenhouse Gas Assessment
Project Name:	HoKua Place
Applicant:	HG Kaua'i Joint Venture LLC 9911 S. 78 th Avenue Hickory Hills, IL 60457
Agent:	G70 111 S. King St., Suite 170 Honolulu, HI 96813
Approving Agency:	State of Hawai'i Land Use Commission 235 South Beretania Street, Ste 406 Honolulu, Hawai'i 96813
Project Location:	Kawaihau District, Kapa'a, Kaua'i
Tax Map Keys (TMK)	(4) 4-3-003:001 (por.)
State Land Use District:	Agriculture
Kaua'i General Plan:	Neighborhood General
Kaua'i County Zoning	Agriculture
Special Management Area:	Outside SMA
Flood Zone:	X: Area determined to be outside the 100-year floodplain with minimal flooding

1.2 Report Purpose and Scope

The purpose of this report is to evaluate the potential greenhouse gas (GHG) emissions impacts associated with the implementation of the planned HoKua Place Project (Project). This assessment was triggered by the Project's petition to the Land Use Commission (LUC) for a State Land Use Boundary Amendment. Specifically, the petition is to change the State's Land Use District from Agricultural Land Use District to Urban Land Use District. Per Hawai'i Administrative Rules (HAR) Chapter 15-15-50(c)(24)(C): Application Requirements for Boundary Amendment Petitions, *the petitioner shall prepare a statement and analysis addressing the overall carbon footprint of the proposed development and any mitigation measures or carbon footprint reductions proposed.*

This GHG Assessment describes the existing setting of the project site, describes the relevant regulatory setting, and discusses the methodology used to evaluate GHG emissions related to the Project. The assessment evaluates potential impacts related to GHGs that would result from construction and operations, and identifies mitigation measures as necessary related to implementation of the Project.

1.3 Regional and Local Setting

The Project site is located in the residential/resort town of Kapa'a along the eastern coast of the Island of Kaua'i (*Figure 1-1*). The Project area consists of an approximately 96-acre portion of the 163-acre parcel (TMK (4) 4-3-003:001). The site is located within the traditional moku of Kawaihau and the ahupua'a of Kapa'a.

The Project site is situated at the north-west corner of the Kapa'a Bypass Road and Olorena Road. The Kapa'a Bypass Road, located south and east of the property, separates the Project site from the Kapa'a town center. Olorena Road runs along and adjacent to the northern boundary of the property. The Kapa'a Middle School is located on the northern end of the subject parcel, fronted by Olorena Road. The western boundary of the Project site is bordered by a small intermittent stream. The stream flows from north to south along the boundary, passes under a bridge on the Kapa'a Bypass Road at the southwest corner of the property, and empties into the Waiākea drainage canal downstream from the property.

The lands surrounding the Project to the north and east are designated as "Residential Community" and "Neighborhood General" by the Updated Kaua'i General Plan. The Property is contiguous to existing urban lands, to the south and across the Kapa'a Bypass Road. These existing lands are classified Urban by the State Land Use Commission and zoned Residential by the County of Kaua'i.

1.4 Proposed Project Description

HG Kaua'i Joint Venture LLC is planning to develop a residential community consisting of a mix of single-family and multi-family residential, market and affordably priced homes, commercial, community park, and open green space. The Project is designed as a sustainable community that aims to preserve the rural character of Kapa'a while accommodating Kaua'i's growing housing needs.

Approximately 96-acres will be subdivided into single family and multifamily lots providing for a total of 683-multi-family units and 86-single family lots and homes. Approximately 30 percent of the housing units are designated as affordable. The Project also includes open space encompassing 13.25-acres; a 3.1-acre park adjacent to the existing Kapa'a Middle School with an area for the county's proposed

relocation of the Kapa'a county swimming pool; and 1.4-acres for commercial use. In accordance with County and State Department of Transportation requirement, improvements will include an intersection on Kapa'a Bypass Road, bus stops, sidewalks and bike and walking paths to the existing Kapa'a Middle School.

The Project plans to share a portion of the infrastructure with the adjacent and adjoining HoKua Farm Lots. A 4-acre solar farm, located within the Farm Lots, generates 1.18 MW of electricity that feeds into the Kaua'i Island Utility Cooperative's (KIUC) distribution grid.

A Project's planned land uses are summarized in *Table 1-1* below and shown conceptually in *Figure 1-2*.

Table 1-1: Summary of Project Land Uses

Land Use	Acreage	Number of Units	Population*
Large Lot Single Family Homes (10,000 sf)	8.26	36	113
Medium Lot Single Family Homes (7,500 sf)	8.60	50	157
Multi-Family Dwelling (4 Plex)	45.82	452	1,415
Affordable Housing Dwellings (low-rise)	15.63	231	723
Commercial	1.40		
Community Park and Pool	3.10		
Open Space	13.25		
Total	96.06	769	2,408

*Populations estimates derived from average Kaua'i household size from 2008-2014, <https://www.census.gov/quickfacts/kauaicountyhawaii>

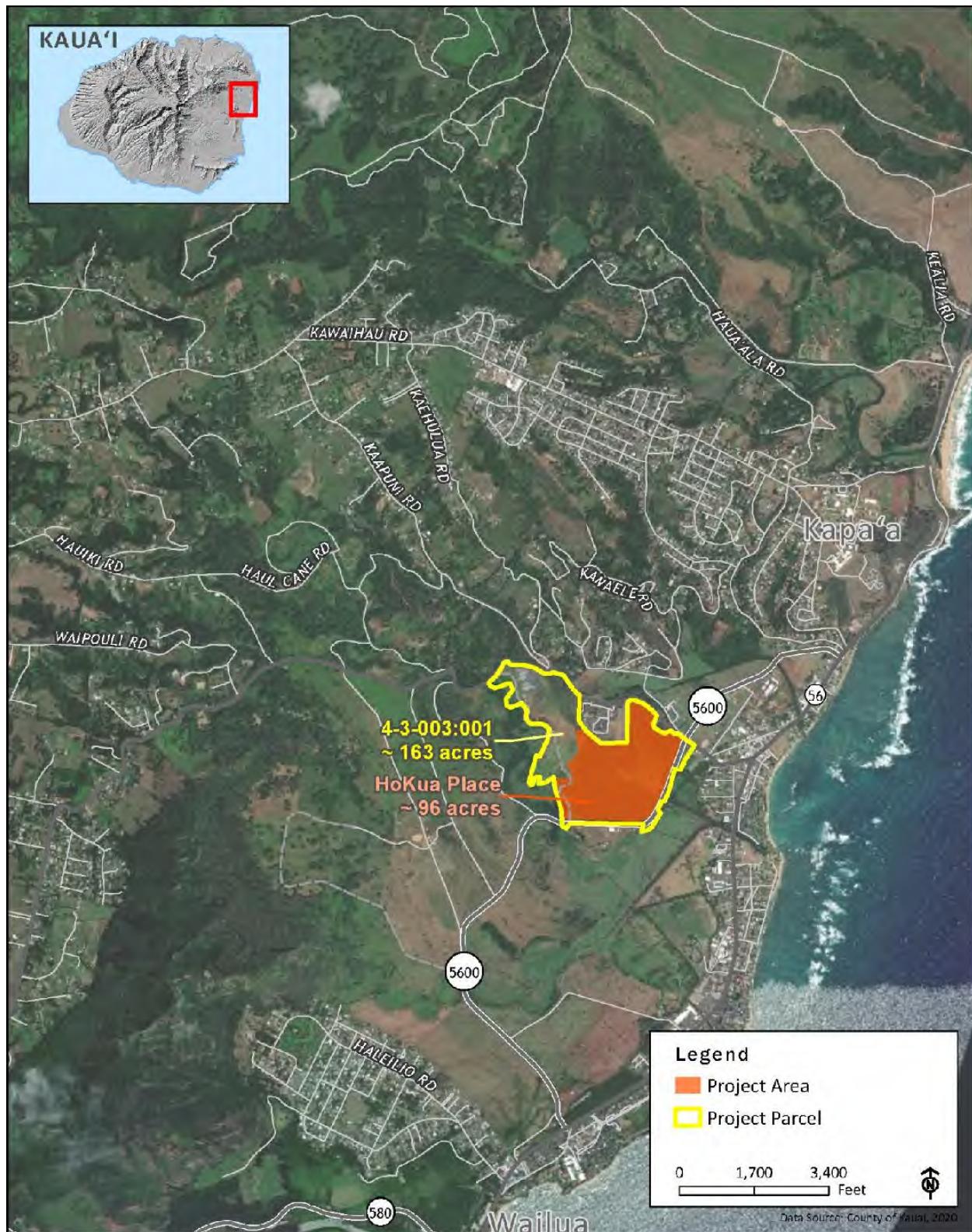


Figure 1-1

County of Kaua'i, TMK Parcel Map of Project Area

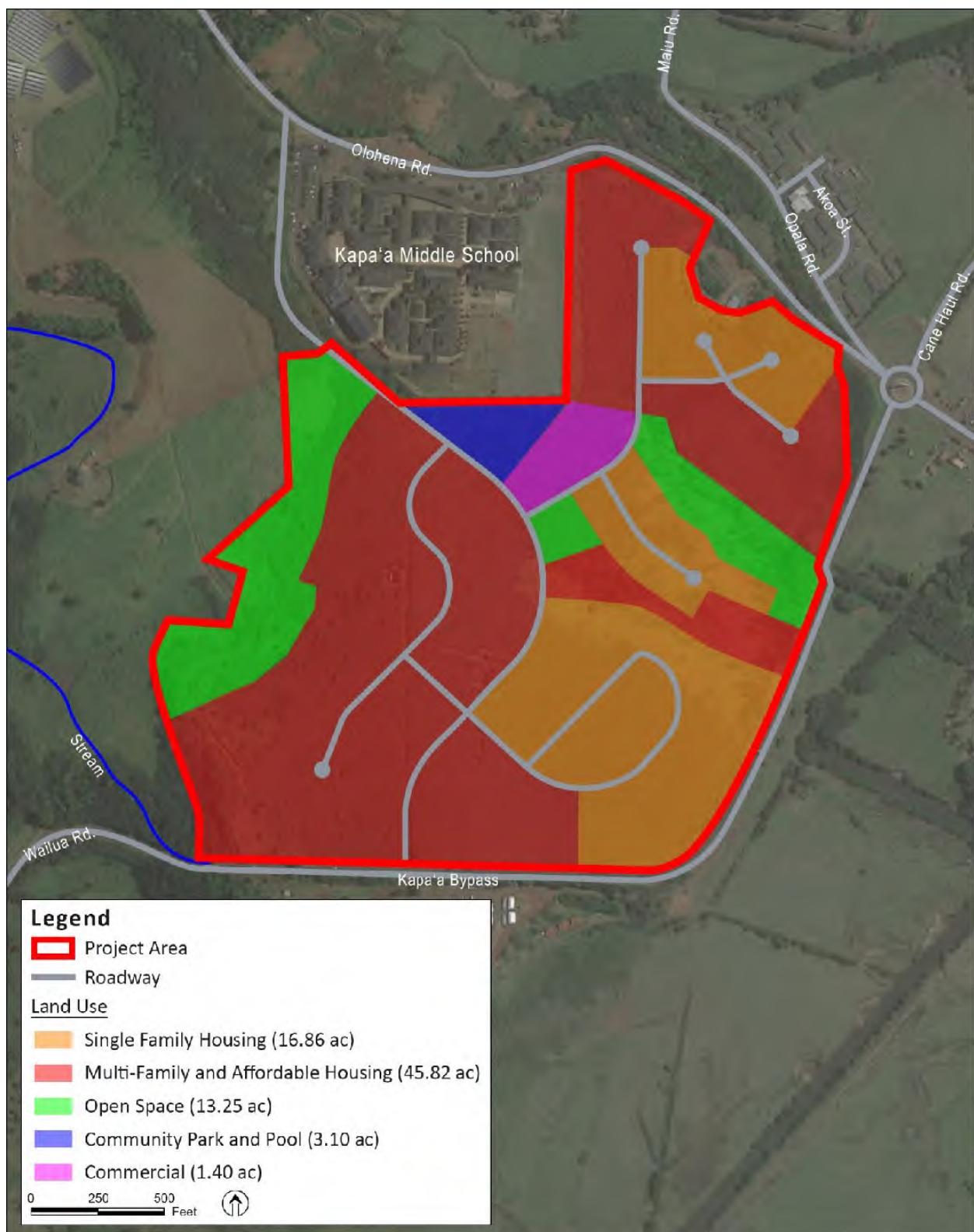


Figure 1-2

Conceptual Land Use Plan of the Project Area

Chapter 2

Environmental Setting

2.1 Climate Change Overview

Climate change refers to any significant change in measures of climate, such as temperature, precipitation, or wind patterns, lasting for an extended period of time (decades or longer). The Earth's temperature depends on the balance between energy entering and leaving the planet's system. Many factors, both natural and human, can cause changes in Earth's energy balance, including variations in the Sun's energy reaching Earth, changes in the reflectivity of Earth's atmosphere and surface, and changes in the greenhouse effect, which affects the amount of heat retained by Earth's atmosphere (EPA 2017).

The greenhouse effect is the trapping and accumulation of heat in the Earth's atmosphere by gases and particulates known as GHGs. Approximately half of the Sun's light reaching Earth's atmosphere passes through the air and clouds to the surface, where it is absorbed and then radiated upward in the form of infrared heat. About 90 percent of this heat is then absorbed by the GHGs and radiated back towards the surface. The greenhouse effect is a naturally occurring process that contributes to the regulation of Earth's temperature and is what creates the comfortable, livable environment on the planet.

Human activities that emit additional GHGs to the atmosphere, increase the amount of infrared radiation that gets absorbed before escaping into space. A build-up of radiation in the atmosphere can enhance the greenhouse effect and cause the Earth's surface temperature to rise. The atmospheric concentrations of GHGs have increased to levels not seen in the last 800,000 years. The primary drivers for this increase in GHGs are fossil fuel emissions and emissions associated with land use changes (IPCC 2013). Continued emissions of GHGs will cause further warming and changes in all components of the climate system.

2.1.1 GREENHOUSE GASES AND OTHER CLIMATE FORCING SUBSTANCES

A GHG is any gas that absorbs infrared radiation in the atmosphere. GHGs include, but are not limited to, carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), ozone (O_3), water vapor (H_2O), hydrofluorocarbons (HFCs), hydrochlorofluorocarbons (HCFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6). Some GHGs, such as CO_2 , CH_4 , and N_2O , occur naturally and are emitted to the atmosphere through natural processes and human activities. Of these gases, CO_2 and CH_4 are emitted in the greatest quantities from human activities. Manufactured GHGs, which have a much greater heat-absorption potential than CO_2 , include fluorinated gases, such as HFCs, HCFCs, PFCs, and SF_6 , which are associated with certain industrial products and processes. A summary of the most common GHGs and their sources is included below.

Carbon Dioxide CO_2 is a naturally occurring gas and a by-product of human activities and is the principal anthropogenic GHG that affects the Earth's radiative balance. Natural sources of CO_2 include respiration of bacteria, plants, animals, and fungus; evaporation from oceans; volcanic out-gassing;

and decomposition of dead organic matter. Human activities that generate CO₂ are from the combustion of fuels such as coal, oil, natural gas, and wood, and changes in land use.

Methane CH₄ is produced through both natural and human activities. CH₄ is a flammable gas and is the main component of natural gas. CH₄ is produced through anaerobic (without oxygen) decomposition of waste in landfills, animal digestion, decomposition of animal wastes, production and distribution of natural gas and petroleum, coal production, and incomplete fossil fuel combustion.

Nitrous Oxide N₂O is produced through natural and human activities, mainly through agricultural activities and natural biological processes, although fuel burning and other processes also create N₂O. Sources of N₂O include soil cultivation practices (microbial processes in soil and water), especially the use of commercial and organic fertilizers, manure management, industrial processes (such as in nitric acid production, nylon production, and fossil-fuel-fired power plants), vehicle emissions, and using N₂O as a propellant (such as in rockets, race cars, and aerosol sprays).

Fluorinated Gases Fluorinated gases are synthetic powerful GHGs emitted from many industrial processes. Fluorinated gases are commonly used as substitutes for stratospheric O₃-depleting substances.

Sulfur Hexafluoride SF₆ is a colorless gas soluble in alcohol and ether and slightly soluble in water. SF₆ is used for insulation in electric power transmission and distribution equipment, semiconductor manufacturing, the magnesium industry, and as a tracer gas for leak detection.

Chlorofluorocarbons CFCs are synthetic chemicals that have been used as cleaning solvents, refrigerants, and aerosol propellants. CFCs are chemically unreactive in the lower atmosphere (troposphere), and the production of CFCs was prohibited in 1987 due to the chemical destruction of stratospheric O₃.

Hydrochlorofluorocarbons HCFCs are a large group of compounds, whose structure is very close to that of CFCs—containing hydrogen, fluorine, chlorine, and carbon atoms—but including one or more hydrogen atoms. Like HFCs, HCFCs are used in refrigerants and propellants. HCFCs were also used in place of CFCs for some applications; however, their use in general is being phased out.

Black Carbon Black carbon is a component of fine particulate matter (PM2.5), which has been identified as a leading environmental risk factor for premature death. It is produced from the incomplete combustion of fossil fuels and biomass burning, particularly from older diesel engines and forest fires. Black carbon warms the atmosphere by absorbing solar radiation, influences cloud formation, and darkens the surface of snow and ice, which accelerates heat absorption and melting. Black carbon is a short-lived species that varies spatially, which makes it difficult to quantify the global warming potential (GWP). Diesel particulate matter emissions are a major source of black carbon and are toxic air contaminants.

Water Vapor The primary source of water vapor is evaporation from the ocean, with additional vapor generated by sublimation (change from solid to gas) from ice and snow, evaporation from other water bodies, and transpiration from plant leaves. Water vapor is the most important, abundant, and variable GHG in the atmosphere and maintains a climate necessary for life.

Ozone Tropospheric O₃, which is created by photochemical reactions involving gases from both natural sources and human activities, acts as a GHG. Stratospheric O₃, which is created by the interaction between solar ultraviolet radiation and molecular oxygen (O₂), plays a decisive role in the stratospheric

radiative balance. Depletion of stratospheric O₃, due to chemical reactions that may be enhanced by climate change, results in an increased ground-level flux of ultraviolet-B radiation.

Aerosols Aerosols are suspensions of particulate matter in a gas emitted into the air through burning biomass (plant material) and fossil fuels. Aerosols can warm the atmosphere by absorbing and emitting heat and can cool the atmosphere by reflecting light.

2.1.2 SOURCES OF GREENHOUSE GAS EMISSIONS

Human activities are responsible for the majority of the increase in GHGs in the atmosphere over the last 150 years. The largest source of greenhouse gas emissions from human activities in the United States is from burning fossil fuels for electricity, heat, and transportation (EPA 2017).

According to Hawai'i Department of Health's (DOH) Greenhouse Gas Emissions Report (2019), total GHG emissions in Hawai'i were 19.58 million metric tons of carbon dioxide equivalent (MMT CO₂ Eq.) in the year 2016. Net emissions, which take into account carbon sinks, were 13.07 MMT CO₂ Eq. Emissions from the Energy sector accounted for the largest portion (87 percent) of total emissions in Hawai'i, followed by the Agriculture, Forestry, and Other Land Use (AFOLU) sector (6 percent), the Industrial Processes and Product Use (IPPU) sector (4 percent), and the Waste sector (4 percent). CO₂ was the largest single contributor to statewide GHG emissions in 2016, accounting for roughly 89 percent of total emissions. CH₄ is the second largest contributor (6 percent), followed closely by HFCs and PFCs (4 percent), N₂O (2 percent), and SF₆ (less than 0.1 percent). *Figure 2-1* below shows Hawai'i emissions for 2016 by sector and gas.

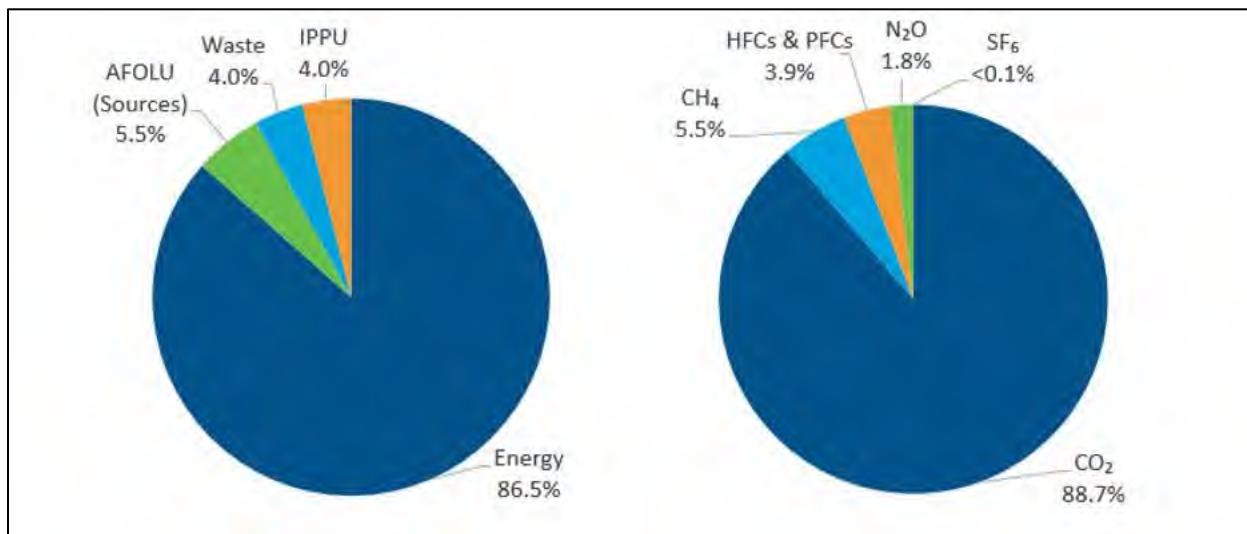


Figure 2-1

Hawai'i 2016 GHG Emissions by Sector and Gas

2.1.3 CARBON SEQUESTRATION

Carbon sequestration is the process by which atmospheric CO₂ is taken up by trees, grasses, and other plants through photosynthesis and stored as carbon in biomass (trunks, branches, foliage, and roots) and soils.

According to the Intergovernmental Panel on Climate Change's (IPCC) Climate Change and Land report (2019), when natural or forested areas are developed for urban land uses, a larger amount of CO₂ enters the atmosphere due to the absence of trees and their function in the carbon cycle. The development of the forested areas may also impact the surface temperature and evapotranspiration levels in the region. As sunlight reaches the land surface, a portion of light is reflected back into the atmosphere and a remaining portion is absorbed and converted into heat. Darker surfaces absorb more solar radiation than lighter surfaces, therefore, urban land uses will reflect a greater proportion of solar radiation into the atmosphere than the darker colored canopy of forests.

Conversely, planting new trees has the potential to capture CO₂ from the atmosphere and mitigate or reverse global warming. A mature hardwood tree can absorb as much as 48 pounds of carbon dioxide per year (SOER, 2015). The sink of carbon sequestration in forests and wood products helps to offset sources of CO₂ to the atmosphere, such as deforestation, forest fires, and fossil fuel emissions.

2.1.4 POTENTIAL EFFECTS OF CLIMATE CHANGE

Although climate change is driven by global atmospheric conditions, climate change impacts are felt locally. The University of Hawai'i (UH), Center for Island Climate Adaptation and Policy published a Briefing Sheet summarizing specific changes observed in Hawai'i (Fletcher, 2010). Based on peer-reviewed scientific journals and government reports, it presents evidence of climate change in Hawai'i as:

1. Rising surface temperature,
2. Decreased rainfall and stream flow,
3. Increased rain intensity,
4. Increased sea level and sea surface temperatures, and
5. Ocean acidification.

Due to the heat-trapping effects of GHG, climate scientists project that if GHG emissions continue to accelerate at current output trends, then the average global temperature will likely increase by three to seven degrees Fahrenheit (1.7 to 3.9 degrees Celsius) by the year 2100. These figures were derived from a number of global climate models, which were based on various scenarios of changes in the concentrations of GHG in the Earth's atmosphere.

2.2 Existing Climate Conditions

Climate encompasses variable factors including temperature, humidity, wind, precipitation, and other meteorological measurements in a given region over time. Climate can be contrasted to weather, which is the present condition of these elements and their variations over shorter periods. A microclimate is a local atmospheric zone where the climate is distinct from the surrounding climate. In the present case the area of concern with respect to microclimatic effects is the area on and immediately adjacent to the 96-acre project site where such things as air temperature, wind speed/direction and humidity could be altered by construction and operation of the proposed facilities.

The Hawaiian Island chain is situated south of the large Eastern Pacific semi-permanent high-pressure cell, the dominant feature affecting air circulation in the region. This high-pressure cell produces very persistent winds over the islands called the northeast trade winds. During the winter months, cold fronts sweep across the north central Pacific Ocean, bringing rain to the Hawaiian Islands and intermittently modifying the trade wind regime. Thunderstorms, which are rare but most frequent in the mountains, also contribute to annual precipitation. There is great climatic variation across the island of Kaua'i.

2.2.1 WINDS

The northeast trade winds are the most important determinant of Kaua'i's climate. The trade wind zone moves north and south seasonally with the sun, so that it reaches its northernmost position in the summer. Consequently, the trade winds are strongest and most persistent from May through September, when the trades are prevalent 80 to 95 percent of the time. From October through April, Hawai'i is located to the north of the heart of the trade winds, and their frequency decreases to about 50 percent (as a monthly average). Kaua'i's topography interacts with the winds to produce large variations in conditions from one locality to another. Air blowing inland as part of the trade wind flow is redirected horizontally and vertically by the mountains and valleys. This complex three-dimensional flow of air results in marked wind speed and directional differences from place to place in wind speed, cloudiness, and rainfall. The winds in the subject Project area typically vary between about 5 and 6 meters per second (*Figure 2-2*).

2.2.2 TEMPERATURE AND SUNLIGHT

Temperatures in the Project site are mild and comfortable. The average annual temperature is approximately 73 to 75 degrees Fahrenheit (*Figure 2-3*). Data from the Līhu'e Airport, which is at a slightly lower elevation but otherwise similar to the Kapa'a area, are shown in *Figure 2-5*. The average monthly low temperature is 68°F and the average monthly high is 76°F.

The length of the day in Kapa'a varies over the course of the year. In 2020, the shortest day is December 21, with 10 hours, 47 minutes of daylight; and the longest day is June 20, with 13 hours, 29 minutes of daylight. The Project area receives an annual average of approximately 205-220 W/m² of solar radiation (*Figure 2-4*).

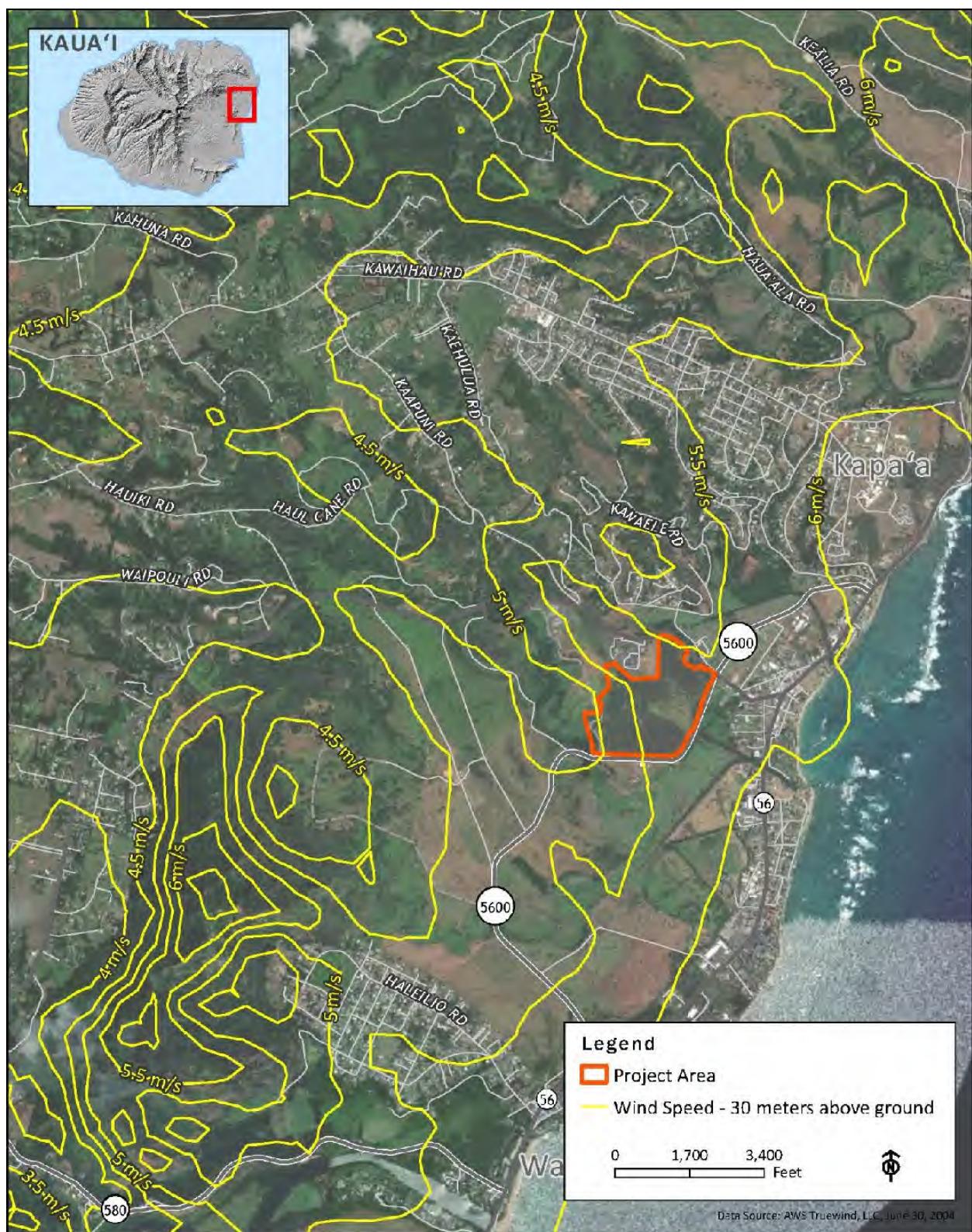


Figure 2-2

Windspeed

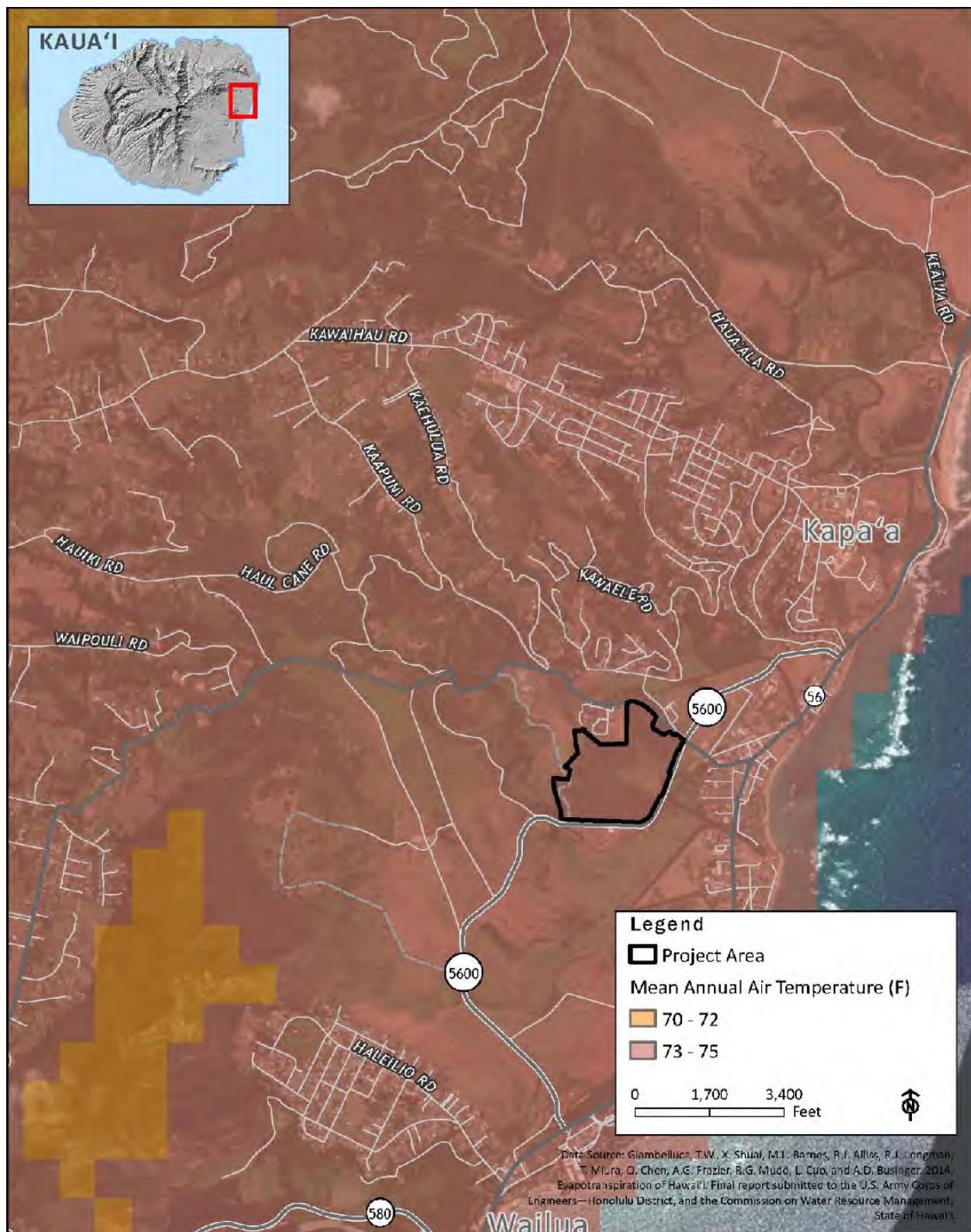


Figure 2-3

Mean Annual Air Temperature

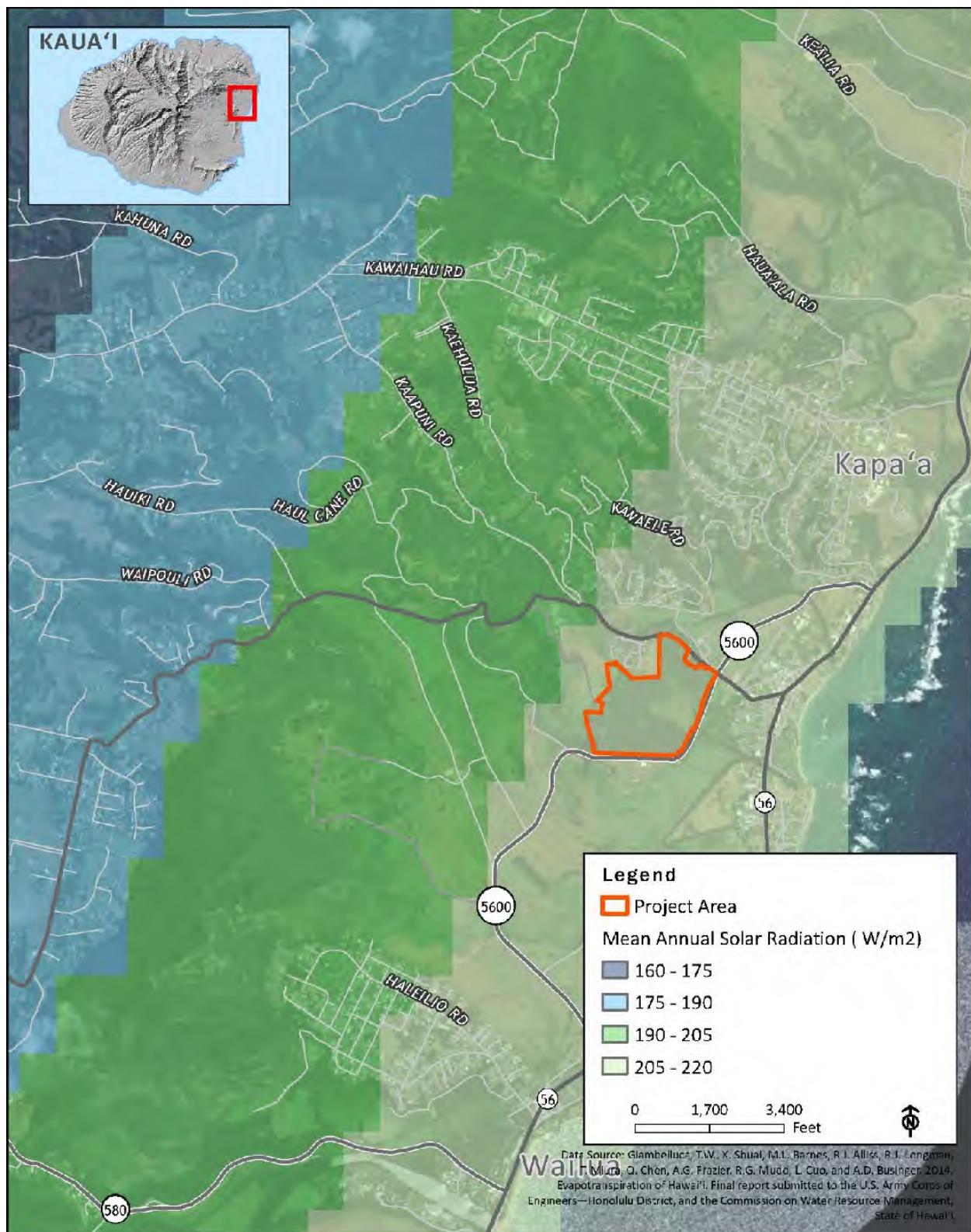


Figure 2-4

Mean Annual Solar Radiation

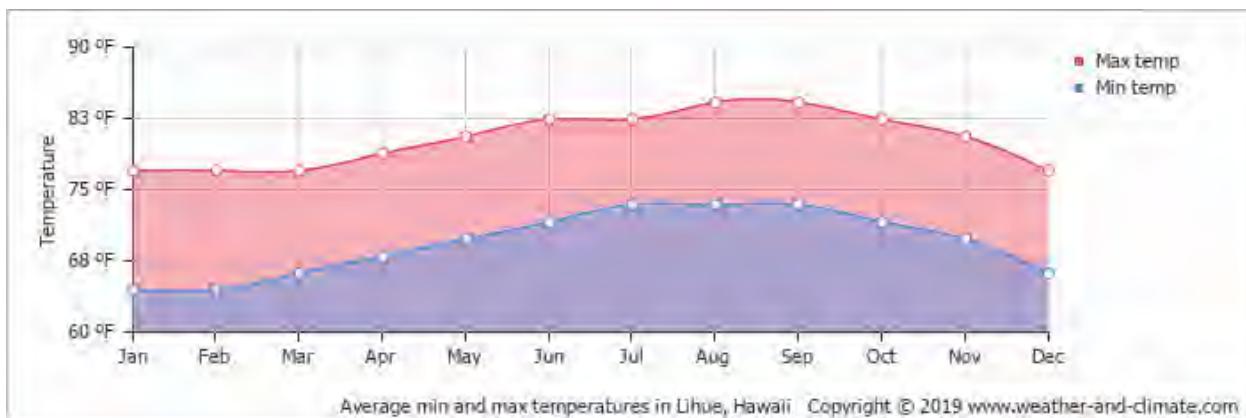


Figure 2-5 **Average Minimum and Maximum Temperatures at the Līhu‘e Airport**

2.2.3 RAINFALL

The eastern and northern region of Kaua‘i are typically wetter than the western and southern regions. The average annual rainfall at the Project site is approximately 45 to 50 inches (*Figure 2-6*).

The nearest rain gauging station to the proposed Project site is at Kapa‘a Stables (Station 1104), just a few hundred feet mauka of the project site. The average annual precipitation at this location between 1940 and 1978 was approximately 55 inches. With average monthly rainfall of 6.8 inches and 7.3 inches, respectively, December and January were the wettest months during that period. With 2.1 inches, June was, on average, the driest month. Average annual rainfall data is summarized in *Table 2-1* below.

Table 2-1: Average Annual Rainfall: Kapa‘a Stables Station 1104, 1940-1978

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
Inches	7.3	5.2	5.8	5.4	3.6	2.1	2.4	2.6	2.5	4.8	6.4	6.8	54.9

*Source: <http://www.worldclimate.com/cgi-bin/data.pl?ref=N22W159+2200+513159C>; Kapa‘a Stables 1104, Kaua‘i data derived from NCDC Cooperative Stations. 33 complete years between 1940 and 1978.

2.2.4 BIOMES AND PLANT SPECIES RANGES

Climate in Hawai‘i is often characterized in terms of the distribution of vegetation. Patterns of species distribution correlate with specific climate conditions that foster the emergence of natural ecosystems. A primary influence on the geographic range of plant species is moisture availability. Moisture Availability is a function of annual precipitation and potential evapotranspiration, which represents the moisture demand of the atmosphere as a function of temperature and humidity and is strongly driven by the amount of incoming solar radiation (HCSU, 2007). A Moisture Availability Index (MAI) is calculated by subtracting the potential evapotranspiration from the median annual precipitation.

There are seven moisture zones for the main Hawaiian Islands that represent general patterns of species distribution: Very Wet ($MAI > 3,161$), Moderately Wet ($3161 > MAI > 1661$), Moist Mesic ($1361 > MAI > 861$), Seasonal Mesic ($861 > MAI > 0$), Moderately Dry ($0 > MAI > -389$), Very Dry ($-389 > MAI > -689$), and Arid ($MAI < -689$). The Project area is located in the region delineated as Moderately Dry (*Figure 2-7*).



Figure 2-6

Annual Rainfall

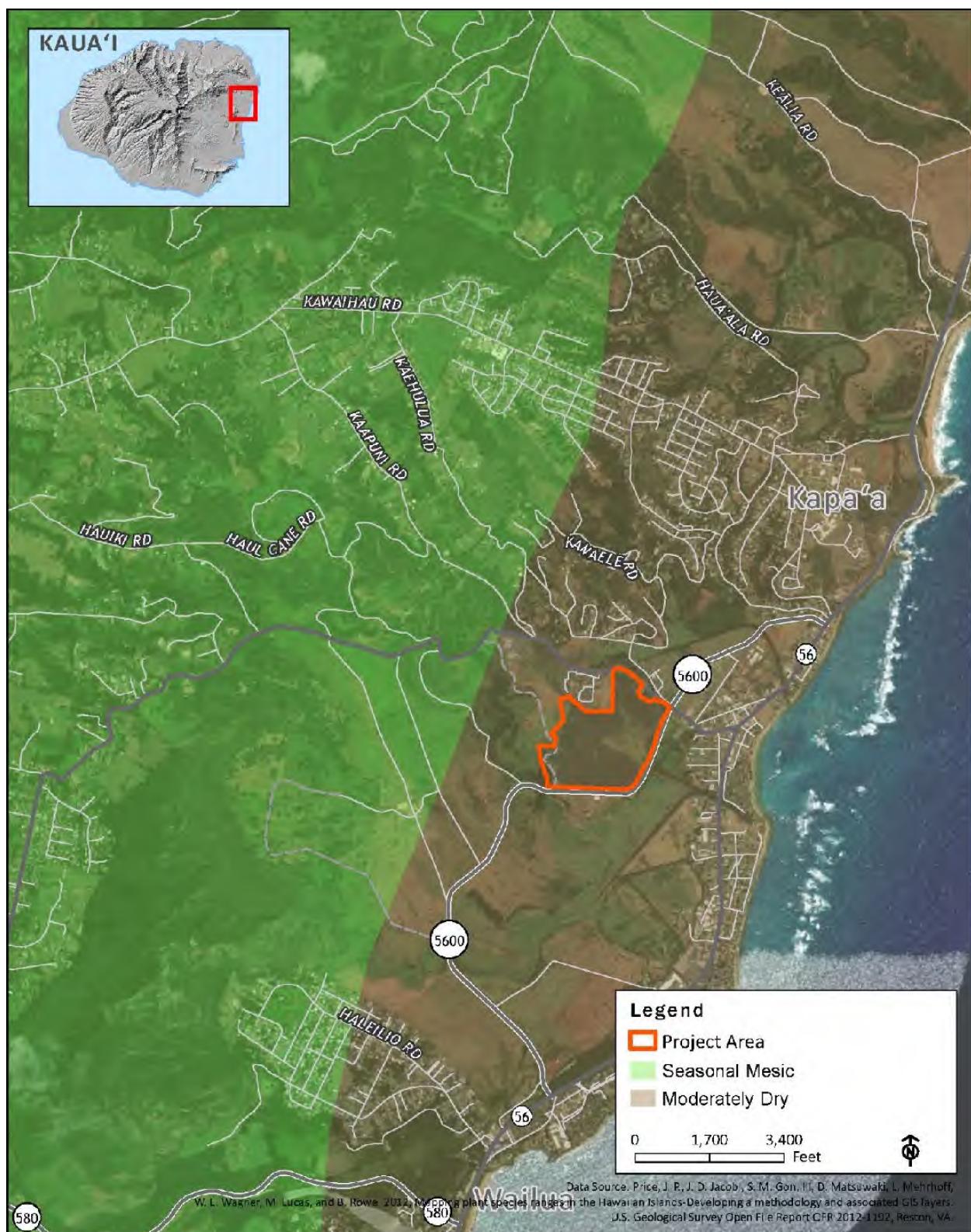


Figure 2-7

Moisture Zone

In 2017, the United States Geological Survey (USGS) conducted a national biologic carbon sequestration assessment throughout the country. The assessment was designed to meet the requirements of the Energy Independence and Security Act of 2007, which calls for coverage of all 50 states and all ecosystems (including forests, grasslands, wetlands, agricultural lands, and rivers, lakes, and estuaries). The assessment focused on current and potential amounts of carbon stored in the ecosystems, and effects of both natural and anthropogenic processes (such as fire, climate change, and land use change) on carbon sequestration.

As part of the USGS national carbon assessment, the Carbon Assessment of Hawai‘i (CAH) Land Cover Biome Map was produced to serve as a base map for estimating current carbon stocks and potential change in carbon sequestration for the Hawaiian Islands under future climate change scenarios (2017). 13 CAH biome units were identified that incorporate a combination of vegetation structure (for example, forest, shrubland, and grassland) and moisture zones.

The study revealed that the majority of land on Kaua‘i island is represented by Wet Forest (23.9 percent), Mesic Forest (20.4 percent), and Agriculture (10.6 percent). The land underlying the Project area was identified as Dry Grassland (*Figure 2-8*). In total, 2.4 percent of Kaua‘i island’s land cover was categorized as Dry Grassland.

Native Mesic and Wet Forests store the highest amount of total carbon among ecosystem types with an estimated 96.3 Teragrams of Carbon (TgC) statewide. Approximately 61 percent of the total carbon in Native Mesic and Wet Forests was in soil, 33 percent in live biomass, and 6 percent in dead biomass. In contrast, grasslands, shrublands, and bare ground, which together cover nearly three times the total area of Native Mesic and Wet Forests statewide, store a total of only 67.9 TgC combined, about 30 percent less than in Native Mesic and Wet Forests.

Another commonly used indicator of the influence of climate on plant growth and survival is the Hardiness Zone. Hardiness Zones are geographic areas defined to encompass a certain range of climatic conditions relevant to plant growth and survival. The United States Department of Agriculture (USDA) Plant Hardiness Zone Map is the standard by which gardeners and growers determine which plants are most likely to thrive at a location. The map is based on the average annual minimum winter temperature, divided into 10-degree Fahrenheit zones.

The Plant Hardiness Zone for the subject Project area is 12b (*Figure 2-9*). The range of minimum average temperatures for zone 12b is between 50 and 60 degree Fahrenheit. This Plant Hardiness Zones is represented by warm, tropical environments that are best suited for plants tolerant of intense heat. Zones 12 is the second warmest of all the USDA hardiness zones featuring tropical plants and exotic fruits.

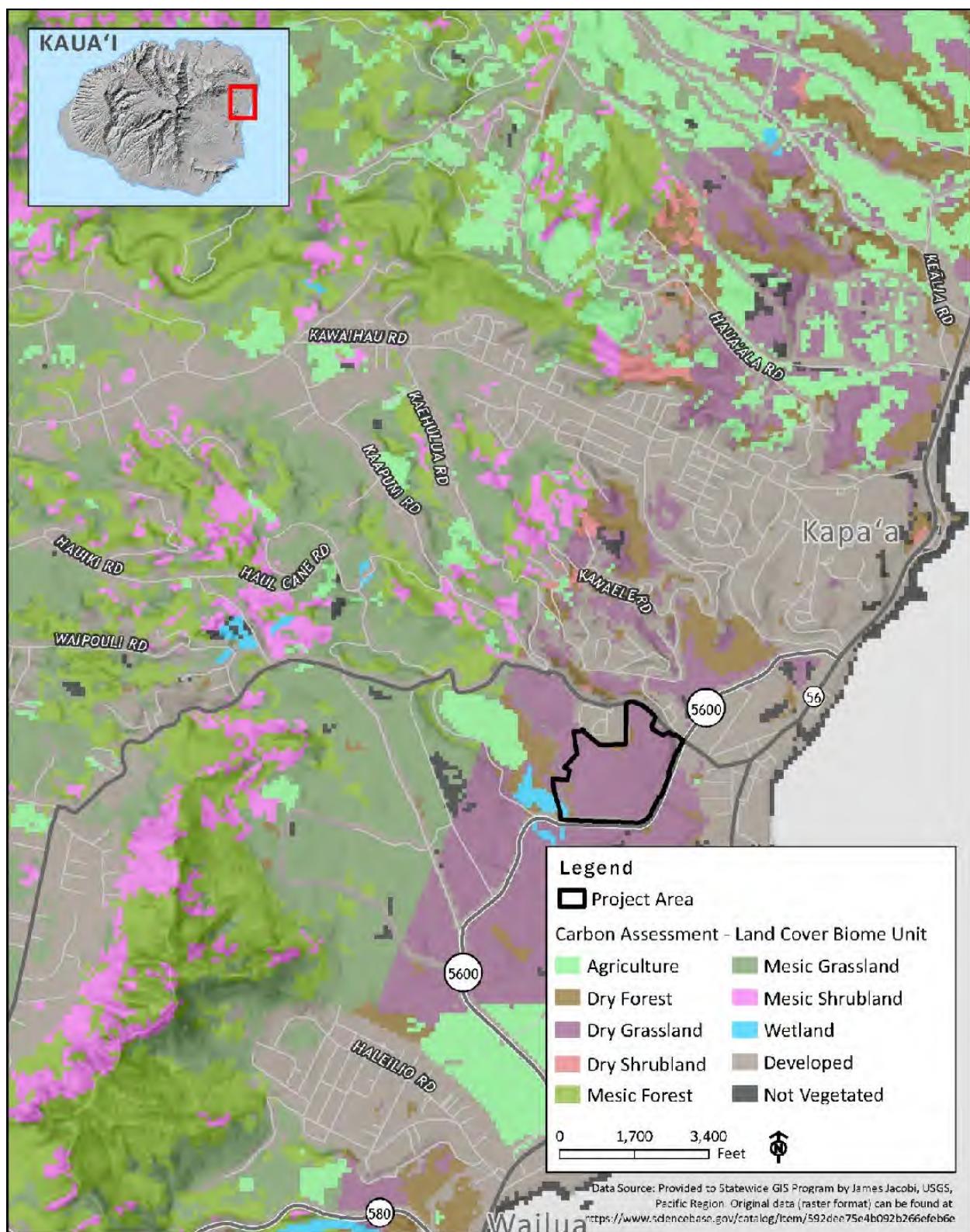


Figure 2-8

Land Cover Biome Unit

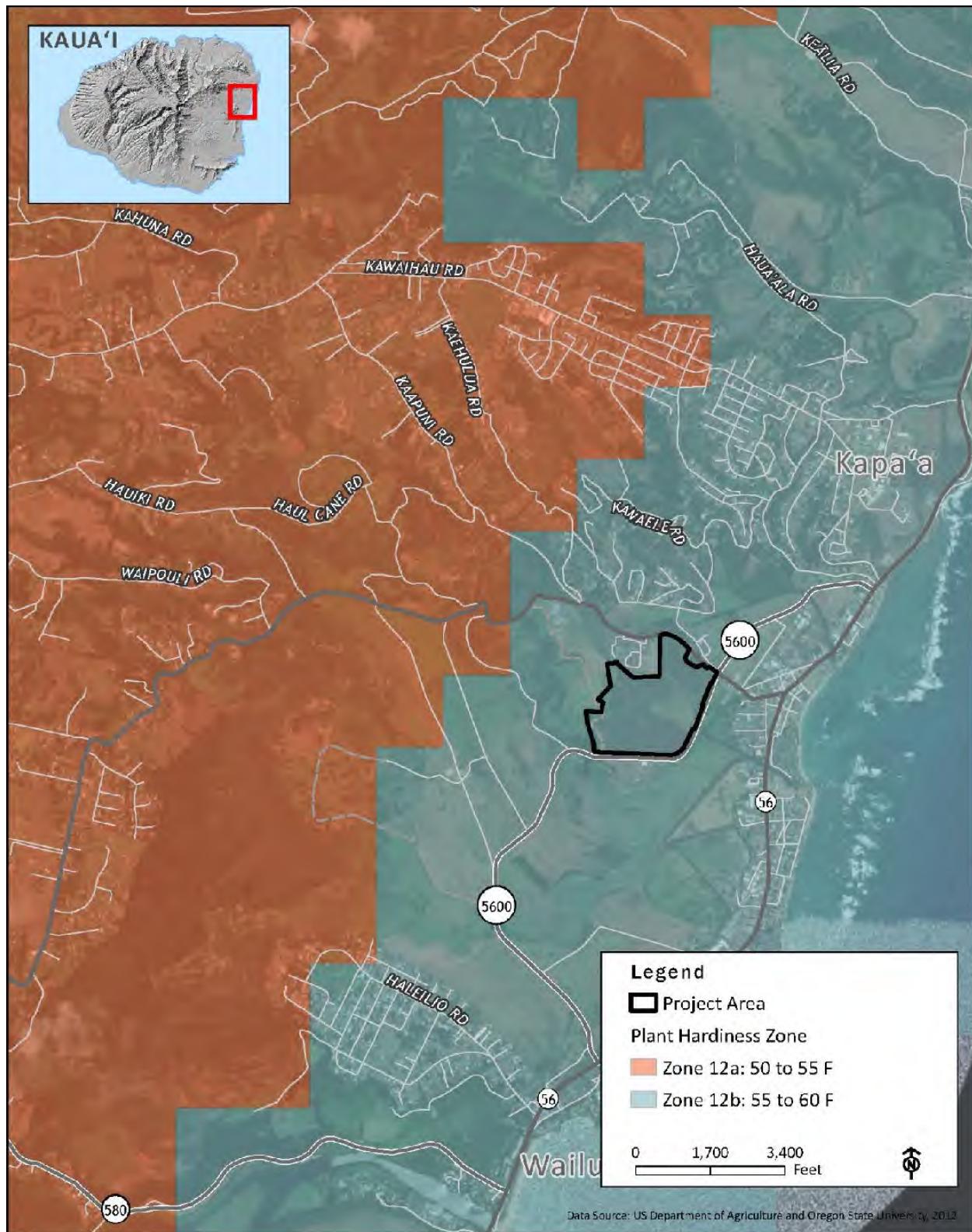


Figure 2-9

Plant Hardiness Zone

Chapter 3

Regulatory Setting

3.1 Hawai‘i’s Climate Action Policy

In 2007, Hawai‘i became the second state in the Nation to set a binding cap on GHG emissions through Act 234, Session Laws of Hawai‘i, which established the state’s policy framework and requirements to reduce GHG emissions statewide to 1990 levels by the year 2020. The Statewide GHG limit was set at 13.66 MMT CO₂ Eq based on 1990 levels. Act 234 directs to the State to adopt rules focused on the “maximum practically and technically feasible and cost-effective reductions in greenhouse gas emissions” (Act 234, Page 12, Line 12). Parts of Act 234 are codified in Hawai‘i Revised Statutes (HRS), Chapter 342B-72, Air Pollution Control Part IV: Greenhouse Gas Emissions rules (2011).

On June 30, 2014, the DOH amended HAR, Chapter 11-60.1 to adopt the Hawai‘i Greenhouse Gas Program with the purpose of combatting the threat of climate change and sea level rise. This program utilizes the Air Pollution Control Permit process of DOH’s Clean Air Branch to regulate GHG emissions statewide, in conjunction with other Federal and Hawai‘i State programs to mitigate GHGs.

On June 6, 2017, Governor Ige signed Act 32 (SB-559), which enshrined the principles and goals of the Paris Climate Agreement as the framework for Hawai‘i to pursue climate change planning. The act expanded the strategies and mechanisms the state could implement to reduce GHG emissions statewide.

3.2 Land Use Commission Rules HAR Chapter 15-15-50(c)

The Project has submitted a petition to LUC for a boundary amendment. The petition is to change the State’s Land Use District from Agricultural Land Use District to Urban Land Use District. Per HAR Chapter 15-15-50(c)(24)(C): Application Requirements for Boundary Amendment Petitions, *the petitioner shall prepare a statement and analysis addressing the overall carbon footprint of the proposed development and any mitigation measures or carbon footprint reductions proposed.*

This GHG assessment has been developed in support of the Project’s petition for State Land Use District Boundary Amendment, and to satisfy the intent of HAR Chapter 15-15-50(c)(24)(C).

3.3 Kaua‘i General Plan

The 2017 Kaua‘i General Plan expresses the island’s commitment towards mitigating the impacts of climate change by reducing and ultimately eliminating emissions caused by the burning of fossil fuels. The General Plan outlines five permitting actions and code changes aimed at reducing Kauai’s overall carbon footprint.

1. Promote higher density residential development near job centers and amenities, while strongly discouraging development that will require residents to commute via automobile to jobs in other areas of the Island.

2. Reduce the carbon footprint of both new and existing buildings and infrastructure through policies and actions that maximize efficiency and minimize the use of fossil fuel resources on the grid.
3. Accelerate the transition to alternative, carbon-free fuels in the ground transportation sector with regulations and policies that support electric vehicle adoption and other alternative fuel infrastructure.
4. Require large new developments and infrastructure projects to include a project carbon footprint analysis estimating the anticipated change in emissions resultant from the proposed project and documenting the emissions reduction strategies deployed by the project to minimize its emissions.
5. Support continued reductions in emissions from local energy production.

This GHG assessment supports the county's effort to quantify the emissions produced by the construction and operations over the lifetime of the Project and to document the mitigation strategies deployed to minimize the overall carbon footprint. The Project's goal of developing a sustainable residential community near the Kapa'a town center is in alignment with the General Plans objective of increasing density near job centers and amenities. Various planned elements inclusive of bicycle routes, pedestrian pathways, bus stops, and local destinations are designed to reduce automobile dependence and reduce vehicle miles traveled. The Project has also been planned with energy conservation and efficiency measures aimed at reducing the community's long-term operational emissions. The Hokua Farm solar farm was constructed to offset the Project's energy consumption and support local energy production.

Chapter 4

Project GHG Analysis

For the planned HoKua Place project, emissions were calculated using the California Emissions Estimator Model (CalEEMod) version 2016.3.2 (CAPCOA 2017). The CalEEMod model provides a platform to calculate emissions generated from the construction and operations of a land use project, using equipment emission factors (mass of emissions per unit time) from sources such as United States Environmental Protection Agency (USEPA), California Air Resources Board (CARB) and site-specific information. CalEEMod also provides default values when site-specific information is not available. Modeling assumptions and results are presented in Appendix A. The estimated project lifetime was assumed to be 30 years.

4.1 Construction Related Greenhouse Gas Emissions

4.1.1 CONSTRUCTION ACTIVITIES

For the purposes of modeling, it was assumed that construction of the Proposed project would commence in October 2022 and would occur over a period of approximately 10 years, ending in October 2031.

The Proposed Project would grade approximately 82.81 acres of the 96.06-acre site. Cut-and-fill quantities would be balanced on site (within the Project area) and no external soil export would be required. Soil balance would occur within each subset area and hauling would not be required between subset areas. Balancing activities are anticipated to be performed through the use of off-road construction equipment (e.g., excavators, graders, dozers, and scrapers). The analysis contained herein is based on the assumptions outlined in *Table 4-1* (duration of phases is approximate).

Table 4-1: Construction Phasing Assumptions

Proposed Project Construction Phase	Construction Start Month/Year	Construction End Month/Year
Site Preparation	10/03/2022	12/26/2023
Grading	12/27/2023	7/30/2024
Building Construction	7/31/2024	11/26/2030
Paving	11/27/2030	4/29/2031
Architectural Coating	5/01/2031	10/01/2031

The construction equipment mix used for estimating the construction emissions of the Proposed Project is shown in *Table 4-2*. Construction phasing specifications were provided by the project applicant, while the default values generated by CalEEMod were used for the construction equipment mix. This equipment mix accounts for both on-site construction equipment, as well as construction equipment required for off-site improvements. For the analysis, it was generally assumed that heavy construction equipment would be operating both on the project site and at the off-site improvement areas for approximately 8 hours per day, 5 days per week (22 days per month) during project construction. CalEEMod defaults were applied for the worker, haul, and vendor trips. Construction worker and vendor trips were calculated using the methodology presented in CalEEMod Users Guide, Appendix A (CAPCOA 2017). In CalEEMod, the estimate of worker trips for site preparation, grading, paving, and trenching are based on 1.25 workers per each individual piece of equipment. The CalEEMod worker rate was utilized for all phases of construction.

Table 4-2: Construction Scenario Assumptions

Construction Phase	One-way Vehicle Trips			Equipment		
	Average Daily Worker Trips	Average Daily Vendor Truck Trips	Total Haul Truck Trips	Equipment Type	Quantity	Usage Hours
Site Preparation	18	0	0	Rubber Tired Dozers	3	8
				Tractors/Loaders/Backhoes	4	8
Grading	20	0	0	Excavators	2	8
				Graders	1	8
				Rubber Tired Dozers	1	8
				Scrapers	2	8
				Tractors/Loaders/Backhoes	2	8
Building Construction	861	216	0	Cranes	1	7
				Forklifts	3	8
				Generator Sets	1	8
				Tractors/Loaders/Backhoes	3	7
				Welders	1	8
Paving	15	0	0	Pavers	2	8
				Paving Equipment	2	8
				Rollers	2	8
Architectural Coating	172	0	0	Air Compressors	1	6

The CalEEMod software allows the user to select pre-programmed “Mitigations” to control certain emissions. The measures selected and assumed to be implemented are:

- Using soil stabilizers
- Replacing ground cover of area disturbed
- Applying water to disturbed surfaces and haul roads three times a day; and
- Reducing speed on unpaved roads to <15 miles per hour

These measures are common practices that are required by local and state regulations to control dust.

4.1.2 CONSTRUCTION GHG EMISSIONS

Table 4-3, shows the estimated annual GHG construction emissions associated with the Proposed Project by year.

Table 4-3: Estimated Annual Construction GHG Emissions				
Construction Year	CO ₂	CH ₄	N ₂ O	CO ₂ Eq
	Metric Tons per Year			
2022	1.7496	0.0005	0.0000	1.7616
2023	112.1961	0.0352	0.0000	113.0759
2024	912.5224	0.1762	0.0000	916.9270
2025	1138.2663	0.0978	0.0000	1,140.7119
2026	1119.4066	0.0967	0.0000	1,121.8233
2027	1102.6743	0.0956	0.0000	1,105.0646
2028	1083.8769	0.0943	0.0000	1,086.2347
2029	1075.0353	0.0938	0.0000	1,077.3803
2030	1029.3391	0.0336	0.0000	1,030.1800
2031	152.2791	0.0059	0.0000	152.4273
Total	10,504.7842	0.7296	0	7,745.5866

As shown in *Table 4-3*, estimated total Project-generated construction GHG emissions are approximately 7,746 MT CO₂ Eq over 10 years (2022 through 2031). To interpret the amortized emission of the Project, CO₂ Eq was divided by a life time of 30 years, resulting in 258 MT CO₂ Eq annually.

4.2 Operational Related Greenhouse Gas Emissions

Emissions from the operational phase of the planned Project were estimated using the CalEEMod. Operational year 2032 was assumed as it would be the first full year following completion of construction.

4.2.1 AREA SOURCES

CalEEMod was used to estimate operational emissions from area sources, including emissions from landscape maintenance equipment. Landscape maintenance includes fuel combustion emissions from equipment such as lawn mowers, rototillers, shredders/grinders, blowers, trimmers, chainsaws, and hedge trimmers. The emissions associated from landscape equipment use are estimated based on CalEEMod default values for emission factors (grams per square foot of building space per day) and number of summer days (when landscape maintenance would generally be performed) and winter days. For the Project area, the average annual number of summer days is estimated at 180 days (CAPCOA 2017).

4.2.2 ENERGY SOURCES

As represented in CalEEMod, energy sources include emissions associated with building electricity. Electricity use would contribute indirectly to criteria air pollutant emissions; however, the emissions from electricity use are only quantified for GHGs in CalEEMod, because criteria pollutant emissions occur at the site of the power plant, which is typically off site.

The KIUC is the sole electric utility on Kuau'i, serving over 23,300 customers. Approximately 92% of KIUC's electricity comes from the burning of imported fossil fuels.

It is the intent of the Project to develop a sustainable community. The Project will incorporate energy conservation and efficiency measures, inclusive of solar energy for water heating and encouraging photovoltaic (PV) systems and other renewable energy sources. To reduce net energy consumption and demand, the Project will consider the implementation of elements of the USEPA Energy Star Program, including efficient insulation, high performance windows, compact construction, efficient ventilation systems, and energy efficient lighting elements and appliances. Furthermore, the Project will seek to harness energy conservations and technologies to facilitate the possibility of net energy metering in building design to empower residents and tenants to reduce their electricity costs and provide energy back to the grid. As there are seldom cold weather days in Kapa'a, the Project will not include the use of hearths or fireplaces for heating.

The Project is designed to share a portion of the infrastructure with the HoKua Farm Lots, an adjoining agricultural community. To date, the HoKua community has already been developed with an operational four-acre solar facility on the adjacent Farm Lots. The PV system spreads over five acres and includes 5,376-solar panels mounted on posts and piers. The system produces 1.18 megawatts of energy that feeds into the KIUC distribution grid. The electricity produced by these PV arrays will allow KIUC to reduce the output and fuel combustion at its existing fossil fuel-fired generating facilities while still meeting the needs of its customers. Since burning oil at power plants produces CO₂, CH₄, and other greenhouse gases, this will ultimately lower KIUC's emissions of those pollutants.

To allocate the appropriate energy consumption rate for each of the Project's land use type, default proportions in CalEEMod were used to calculate an energy intensity rate for each energy category (e.g., Title 24 electricity, Non-Title 24 Electricity, lighting electricity). The creation and long -term operation

of this associated solar energy facility represents a significant offset to anticipated GHG production by the HoKua project.

The Project's energy use rates input into CalEEMod are presented in *Table 4-4*.

Table 4-4: Energy Use Rates			
Land Use	Title 24 Electricity	Non-Title 24 Electricity	Lighting Electricity
	kWh per unit per year		
Single-Family	331.07	6,155.97	1,608.84
Multi-Family	227.22	3,795.01	1,001.10
Affordable Housing	260.86	3,172.76	810.36
Commercial	3.18	3.16	6.22
Community Park and Pool	0	0	0
Open Space	0	0	0

4.2.3 MOBILE SOURCES

To quantify emissions associated with the Project's operational mobile sources, trip generation rates and trip lengths for each analyzed land use were calculated in CalEEMod to estimate the overall weekday daily trips (5,740 trips) and the total average daily vehicle miles traveled (VMT) length data (10.8 miles per trip). Notably, because the Project includes a mix of uses including residential, recreational and commercial uses, the Project would include a mixed-use trips reduction (5% of the total trips). With the increase in population created by this Project in the area, more businesses will develop thus creating jobs where residents can live and work without the use of motor vehicle transportation. In order to account for the mixed-use reduction from the traffic analysis, the traffic mitigation section of CalEEMod was updated to reflect a VMT reduction of 5% by selecting suburban center and increase diversity options in CalEEMod.

The model was also adjusted to account for a reduction in internal vehicle trips based on the Project's pedestrian, bicycle, and transit improvements, assuming residents will walk, bus or ride bicycles to visit Kapa'a Town or the neighborhood parks and commercial area. The Project will meet the County recommendations of the "Complete Streets" and the "Multi-Model Land Transportation" Ordinances, as well as the proposed "Smart Code." The Project is designed with short residential blocks, pedestrian walkways at reasonable intervals within a block, two new bus stops, and walking and bicycle paths integrated with Kapa'a Town's future paths.

CalEEMod default data, including trip characteristics, variable start information and emissions factors were used for the model inputs. Project-related traffic was assumed to include a mixture of vehicles consistent with CalEEMod default vehicle fleet assumptions. Emission factors for 2032 (the first full year of project operation) were used to estimate emissions associated with full buildout of the Project.

4.2.4 SOLID WASTE

The Project will generate solid waste, and therefore, result in GHG emissions associated with landfill off-gassing. CalEEMod default values for solid waste generation were used to estimate GHG emissions associated with solid waste. To mitigate the amount of waste generated, the Project will include measures and provisions such as collection systems and storage for recyclables.

4.2.5 WATER AND WASTEWATER

Supply, conveyance, treatment, and distribution of water for the Project require the use of electricity, which will result in associated indirect GHG emissions. Similarly, wastewater generated by the Project requires the use of electricity for conveyance and treatment, along with GHG emissions generated during wastewater treatment. The total water demand for each land use type were allocated based on the default proportions from CalEEMod's indoor and outdoor water use. To reduce net water consumption and demand, the Project will implement water efficient landscape and irrigation systems, and low-flow faucets, toilets, and showerheads.

4.2.6 OPERATIONAL EMISSIONS

The Project will generate operational GHG emissions from area sources (landscape maintenance equipment), energy sources (electricity consumption), mobile sources (vehicle trips), water supply and wastewater treatment, and solid waste. *Table 4-5* presents the Project's operational GHG emissions. Emissions values are shown as unmitigated and with the mitigations discussed above, which includes energy offsets from on-site PV system production.

Table 4-5: Estimated Annual Operational GHG Emissions (2031)

Emissions Source	Category	CO ₂	CH ₄	N ₂ O	CO ₂ Eq
		Metric Tons per year			
Area	Unmitigated	9.3271	0.00889	0	9.5493
	Mitigated	9.3271	0.00889	0	9.5493
Energy	Unmitigated	2141.187	0.062	0.0128	2146.559
	Mitigated	2095.602	0.0607	0.0126	2100.86
Mobile	Unmitigated	5205.116	0.2014	0	5210.15
	Mitigated	4536.848	0.1823	0	4541.405
Solid Waste	Unmitigated	85.2927	5.0407	0	211.3092
	Mitigated	68.2342	4.0325	0	169.0473
Water and Wastewater	Unmitigated	337.1608	0.0704	0.0406	351.0099
	Mitigated	284.8869	0.0568	0.0325	296.0043
Total	Unmitigated	7778.083	5.38339	0.0534	7928.578
	Mitigated	6994.898	4.34119	0.0451	7116.866

As shown in *Table 4-5*, the annual operational emissions for the Project with mitigation will be approximately 7,117 MT CO₂ Eq per year (or 237 MT CO₂ Eq per year when amortized over 30 years).

4.3 Carbon Sequestration

The Property is located on the north side of Kapa'a town on former sugarcane lands. Following the closing of Lihue Plantation, the Project area was fallowed, and has since been dominated by alien vegetation. The Project area is classified as the Dry Grassland biome unit (*Figure 2-8*).

The calculation methodology and default values provided in CalEEMod (CAPCOA 2017) were used to calculate potential GHG emissions associated with the one-time change in carbon sequestration capacity of a vegetation land use type. The calculation of the one-time loss of sequestered carbon is the product of the converted acreage value and the carbon content value for each land use type. The loss of sequestered carbon resulting from the removal of vegetation on site is estimated based on the carbon sequestration rate for the vegetation type and the approximate acreages.

It is conservatively assumed that all sequestered carbon from the removed vegetation will be returned to the atmosphere; that is, the vegetation will not be re-used in a solid form or another form that would retain carbon. GHG emissions generated during construction activities, including clearing, tree removal, and grading, are estimated in the construction emissions analysis.

CalEEMod calculates GHG emissions resulting from land conversion and uses six general IPCC land use classifications for assigning default carbon content values (in units of MT CO₂/acre). CalEEMod default carbon content values were assumed to estimate the loss of sequestered carbon (release of CO₂) from the removal of the grasslands (4.3 MT CO₂/acre) vegetation category, which is based on data and formulas provided in the IPCC reports. The Project would permanently disturb a total of 82.81 acres of the Project Area. It is assumed that the 13.25 acres of open space will remain undisturbed.

Table 4-6 presents the estimated one-time carbon-stock change resulting from the Project's land use change.

Table 4-6: Estimated Loss of Sequestered Carbon			
Vegetation Land Use Category	Total Acres	Biogenic CO ₂ Sequestered Factor (MT CO ₂ /Acre)	Sequestered CO ₂ (MT CO ₂)
Grassland	82.81	4.3	356.9111

The one-time carbon-stock change from planting new trees was also estimated based on the default values provided in CalEEMod. Trees sequester CO₂ while they are actively growing. Thereafter, the accumulation of carbon in biomass slows with age and is assumed to be offset by losses from clipping, pruning, and occasional death. Active growing periods are subject to, among other things, species, climate regime, and planting density; however, for modeling purposes, CalEEMod assumes the IPCC active growing period of 20 years (CAPCOA 2017).

CalEEMod calculates GHG sequestration that results from planting of new trees and has default carbon content values (in units of MT CO₂/tree/year) for ten different general tree species and a miscellaneous tree category. The Project estimates the planting of approximately 300 new trees throughout the site. Due to the potentially large number of different trees which will be planted within

the project site, the CO₂ sequestration rate for the miscellaneous category of 0.0354 MT CO₂/tree/year was assumed in this analysis. It is assumed that all 300 trees will grow for a minimum of 20 years.

Table 4-7 presents the estimated one-time carbon-stock change resulting from the planting of new trees.

Table 4-7: Estimated Gain of Sequestered Carbon

Tree Category	Growing Period (year)	Number of Trees	Tree CO ₂ Sequestered Factor (MT CO ₂ /Tree/Year)	Gain of Sequestered CO ₂ (MT CO ₂)
Miscellaneous	20	300	0.0354	212.4000

The Project will result in the removal of grassland vegetation of approximately 82.21 acres. The removal of vegetation will result in the one-time release of sequestered carbon of approximately 357MT CO₂ Eq. (or 11.9 MT CO₂ Eq per year when amortized over 30 years). The emissions associated with the removal of vegetation will be in most part offset by the planting of at least 300 new trees, which will result in the one-time sequestration of approximately 212 MT CO₂ Eq (or 7 MT CO₂ Eq per year when amortized over 30 years).

4.4 Conclusions

The Project represents a responsibly designed community that will help meet the housing needs for Kaua'i while minimizing the overall carbon footprint. The Project is expected to generate GHG emissions related to construction, operations, and the one-time land use change from grassland to a residential neighborhood. There are numerous offsetting mitigating aspects of the Project, including energy efficient design, best management construction practices, planting new trees, multi-modal transportation options, and a four-acre solar farm. The Project is not anticipated to interfere with the state's commitment to reduce its emission levels to below 1990 levels.

Table 4-8 shows the Estimated Annual Net GHG Emissions for the Project.

Table 4-8: Estimated Annual Net GHG Emissions

Emissions Source	CO ₂ Eq Metric Tons per Year
Construction Emissions (Amortized Over 30 Years)	258
Annual Operational Emissions	7,117
Loss of Carbon from Vegetation Removal (Amortized Over 30 Years)	12
Annual Gain from Sequestered Carbon (Amortized Over 30 Years)	-7
Total Annual Emissions	7,380
Project Population	2,408
Service Person/Per Capita GHG Efficiency	3.06

The total Project emissions during operation were estimated to be approximately 7,117 MT CO₂ Eq per year which includes amortized construction emissions of 258 MT CO₂ Eq per year and the loss of carbon from vegetation removal of 12 MT CO₂ Eq per year. Furthermore, the planting of trees will reduce the amount of operational emissions by an estimated 7 MT CO₂ Eq per year resulting in an overall operational GHG impact of 7,380 MT CO₂ Eq per year. Based on a population of 2,408 people, the Project will result in GHG emissions of approximately 3.06 MT CO₂ Eq /person/yr.

Appendices

HoKua Place GHG Assessment - Statewide , Annual

HoKua Place GHG Assessment

Statewide , Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
City Park	1.00	Acre	13.25	0.00	0
Recreational Swimming Pool	1.00	1000sqft	3.10	131,526.00	0
Apartments Low Rise	231.00	Dwelling Unit	15.63	231,000.00	723
Condo/Townhouse	452.00	Dwelling Unit	45.82	452,000.00	1415
Single Family Housing	36.00	Dwelling Unit	8.26	360,000.00	113
Single Family Housing	50.00	Dwelling Unit	8.60	375,000.00	157
Convenience Market (24 Hour)	1.00	1000sqft	1.40	60,984.00	0

1.2 Other Project Characteristics

Urbanization	Urban	Wind Speed (m/s)	5.5	Precipitation Freq (Days)	180
Climate Zone	13			Operational Year	2032
Utility Company	Statewide Average				
CO2 Intensity (lb/MWhr)	1001.57		CH4 Intensity (lb/MWhr)	0.029	N2O Intensity (lb/MWhr)
	0.006				

1.3 User Entered Comments & Non-Default Data

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Project Characteristics - Project Area is located in Kapaa Kauai. Windspeed of Project Area is 5.5 m/s according to AWS Truewind, LLC (2004). Climate Zone 13 selected as best proxy for Kapaa temperature ranges. Utility Company service area is KIUC.

Land Use - Land Use - Affordable housing was assumed to be 1.5 times more dense than multi-family homes. The building area for the pool / park was derived by subtracting the area of a 82 ft by 42.8 ft swimming pool from the 3.1 acre park.

Construction Phase - Construction Phase - Demolition is not required for the project

Grading - Grading - Area for grubbing is assumed to be the total Project area (96.06 ac) minus the areas reserved as open/green space (13.25 ac).

Woodstoves - Woodstoves - Fireplaces and woodstoves will not be required for heating.

Landscape Equipment -

Energy Use - Natural Gas is not included in the Project's energy profile.

Water And Wastewater - The Project is served by the County Wastewater System and will not include septic tanks or facultative lagoons.

Land Use Change -

Sequestration -

Construction Off-road Equipment Mitigation - These measures are common practices that are required by local and state regulations to control dust.

Mobile Land Use Mitigation - Mix of uses and density increase. Project will meet the County recommendations of the Complete Streets, Multi-Model Land Transportation Ordinances, and the proposed Smart Code. Residents can live and work without the use of a motor vehicle.

Mobile Commute Mitigation -

Area Mitigation -

Energy Mitigation - 1.18 MW produced by Solar Farm.

Water Mitigation - Water restrictions during drier periods, public education and efficient landscaping practices. Consumption could be reduced through end-user conservation. Efficient fixtures and appliances will reduce indoor water use.

Waste Mitigation - Measures and provisions such as collection systems and storage for recyclables

Table Name	Column Name	Default Value	New Value
tblConstDustMitigation	WaterExposedAreaPM10PercentReduction	61	55
tblConstDustMitigation	WaterExposedAreaPM25PercentReduction	61	55
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	0	15
tblConstructionPhase	NumDays	100.00	1.00
tblConstructionPhase	NumDays	1,550.00	1,650.00

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tblConstructionPhase	PhaseEndDate	2/17/2023	10/3/2022
tblConstructionPhase	PhaseEndDate	5/12/2023	12/26/2023
tblConstructionPhase	PhaseEndDate	12/15/2023	7/30/2024
tblConstructionPhase	PhaseEndDate	11/23/2029	11/26/2030
tblConstructionPhase	PhaseEndDate	4/26/2030	4/29/2031
tblConstructionPhase	PhaseEndDate	9/27/2030	10/1/2031
tblConstructionPhase	PhaseStartDate	2/18/2023	10/4/2023
tblConstructionPhase	PhaseStartDate	5/13/2023	12/27/2023
tblConstructionPhase	PhaseStartDate	12/16/2023	7/31/2024
tblConstructionPhase	PhaseStartDate	11/24/2029	11/27/2030
tblConstructionPhase	PhaseStartDate	4/27/2030	5/1/2031
tblEnergyUse	NT24NG	4,180.00	0.00
tblEnergyUse	NT24NG	4,180.00	0.00
tblEnergyUse	NT24NG	1.09	0.00
tblEnergyUse	NT24NG	4,180.00	0.00
tblEnergyUse	T24NG	7,045.49	0.00
tblEnergyUse	T24NG	10,202.85	0.00
tblEnergyUse	T24NG	1.14	0.00
tblEnergyUse	T24NG	19,206.92	0.00
tblFireplaces	FireplaceDayYear	82.00	0.00
tblFireplaces	FireplaceDayYear	82.00	0.00
tblFireplaces	FireplaceDayYear	82.00	0.00
tblFireplaces	FireplaceHourDay	3.00	0.00
tblFireplaces	FireplaceHourDay	3.00	0.00
tblFireplaces	FireplaceHourDay	3.00	0.00
tblFireplaces	FireplaceWoodMass	3,078.40	0.00
tblFireplaces	FireplaceWoodMass	3,078.40	0.00

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tblFireplaces	FireplaceWoodMass	3,078.40	0.00
tblFireplaces	NumberGas	127.05	0.00
tblFireplaces	NumberGas	248.60	0.00
tblFireplaces	NumberGas	47.30	0.00
tblFireplaces	NumberNoFireplace	23.10	0.00
tblFireplaces	NumberNoFireplace	45.20	0.00
tblFireplaces	NumberNoFireplace	8.60	0.00
tblFireplaces	NumberWood	80.85	0.00
tblFireplaces	NumberWood	158.20	0.00
tblFireplaces	NumberWood	30.10	0.00
tblGrading	AcresOfGrading	0.00	82.81
tblLandUse	LandUseSquareFeet	43,560.00	0.00
tblLandUse	LandUseSquareFeet	1,000.00	131,526.00
tblLandUse	LandUseSquareFeet	64,800.00	360,000.00
tblLandUse	LandUseSquareFeet	90,000.00	375,000.00
tblLandUse	LandUseSquareFeet	1,000.00	60,984.00
tblLandUse	LotAcreage	1.00	13.25
tblLandUse	LotAcreage	0.02	3.10
tblLandUse	LotAcreage	14.44	15.63
tblLandUse	LotAcreage	28.25	45.82
tblLandUse	LotAcreage	11.69	8.26
tblLandUse	LotAcreage	16.23	8.60
tblLandUse	LotAcreage	0.02	1.40
tblLandUse	Population	661.00	723.00
tblLandUse	Population	1,293.00	1,415.00
tblLandUse	Population	103.00	113.00
tblLandUse	Population	143.00	157.00

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tblProjectCharacteristics	PrecipitationFrequency	54	180
tblProjectCharacteristics	WindSpeed	2.2	5.5
tblSequestration	NumberOfNewTrees	0.00	300.00
tblIWATER	AerobicPercent	87.46	100.00
tblIWATER	AerobicPercent	87.46	100.00
tblIWATER	AerobicPercent	87.46	100.00
tblIWATER	AerobicPercent	87.46	100.00
tblIWATER	AerobicPercent	87.46	100.00
tblIWATER	AerobicPercent	87.46	100.00
tblIWATER	AnaerobicandFacultativeLagoonsPercent	2.21	0.00
tblIWATER	AnaerobicandFacultativeLagoonsPercent	2.21	0.00
tblIWATER	AnaerobicandFacultativeLagoonsPercent	2.21	0.00
tblIWATER	AnaerobicandFacultativeLagoonsPercent	2.21	0.00
tblIWATER	AnaerobicandFacultativeLagoonsPercent	2.21	0.00
tblIWATER	AnaerobicandFacultativeLagoonsPercent	2.21	0.00
tblIWATER	SepticTankPercent	10.33	0.00
tblIWATER	SepticTankPercent	10.33	0.00
tblIWATER	SepticTankPercent	10.33	0.00
tblIWATER	SepticTankPercent	10.33	0.00
tblIWATER	SepticTankPercent	10.33	0.00
tblIWATER	SepticTankPercent	10.33	0.00
tblIWOODSTOVES	NumberCatalytic	11.55	0.00
tblIWOODSTOVES	NumberCatalytic	22.60	0.00
tblIWOODSTOVES	NumberCatalytic	4.30	0.00
tblIWOODSTOVES	NumberNoncatalytic	11.55	0.00
tblIWOODSTOVES	NumberNoncatalytic	22.60	0.00
tblIWOODSTOVES	NumberNoncatalytic	4.30	0.00

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tblWoodstoves	WoodstoveDayYear	82.00	0.00
tblWoodstoves	WoodstoveDayYear	82.00	0.00
tblWoodstoves	WoodstoveDayYear	82.00	0.00
tblWoodstoves	WoodstoveWoodMass	3,019.20	0.00
tblWoodstoves	WoodstoveWoodMass	3,019.20	0.00
tblWoodstoves	WoodstoveWoodMass	3,019.20	0.00

2.0 Emissions Summary

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2.1 Overall Construction**Unmitigated Construction**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e	
Year	tons/yr											MT/yr					
2022	1.3400e-003	0.0129	0.0105	2.0000e-005	6.0000e-005	6.2000e-004	6.8000e-004	1.0000e-005	5.8000e-004	5.9000e-004	0.0000	1.7496	1.7496	4.8000e-004	0.0000	1.7616	
2023	0.0865	0.8787	0.6023	1.2800e-003	0.8046	0.0402	0.8447	0.3309	0.0369	0.3679	0.0000	112.1961	112.1961	0.0352	0.0000	113.0759	
2024	0.4394	3.7321	3.8313	0.0102	0.9539	0.1376	1.0915	0.3525	0.1273	0.4798	0.0000	912.5224	912.5224	0.1762	0.0000	916.9270	
2025	0.4248	2.8579	3.8746	0.0125	0.6633	0.0742	0.7376	0.1798	0.0698	0.2495	0.0000	1,138.2663	1,138.2663	0.0978	0.0000	1,140.7119	
2026	0.4133	2.8349	3.7645	0.0123	0.6633	0.0741	0.7374	0.1798	0.0696	0.2494	0.0000	1,119.4066	1,119.4066	0.0967	0.0000	1,121.8233	
2027	0.4022	2.8136	3.6664	0.0121	0.6633	0.0738	0.7372	0.1798	0.0694	0.2491	0.0000	1,102.6743	1,102.6743	0.0956	0.0000	1,105.0646	
2028	0.3895	2.7851	3.5676	0.0119	0.6608	0.0732	0.7340	0.1791	0.0688	0.2479	0.0000	1,083.8769	1,083.8769	0.0943	0.0000	1,086.2347	
2029	0.3789	2.7786	3.4991	0.0118	0.6633	0.0733	0.7366	0.1798	0.0689	0.2486	0.0000	1,075.0353	1,075.0353	0.0938	0.0000	1,077.3803	
2030	0.3425	2.0524	3.3062	0.0114	0.6012	0.0254	0.6266	0.1629	0.0251	0.1880	0.0000	1,029.3391	1,029.3391	0.0336	0.0000	1,030.1800	
2031	26.0164	0.3570	0.8665	1.7500e-003	0.0527	0.0154	0.0681	0.0141	0.0154	0.0295	0.0000	152.2791	152.2791	5.9300e-003	0.0000	152.4273	
Maximum	26.0164	3.7321	3.8746	0.0125	0.9539	0.1376	1.0915	0.3525	0.1273	0.4798	0.0000	1,138.2663	1,138.2663	0.1762	0.0000	1,140.7119	

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2.1 Overall Construction**Mitigated Construction**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e	
Year	tons/yr											MT/yr					
2022	1.3400e-003	0.0129	0.0105	2.0000e-005	6.0000e-005	6.2000e-004	6.8000e-004	1.0000e-005	5.8000e-004	5.9000e-004	0.0000	1.7496	1.7496	4.8000e-004	0.0000	1.7616	
2023	0.0865	0.8787	0.6023	1.2800e-003	0.3644	0.0402	0.4045	0.1495	0.0369	0.1865	0.0000	112.1960	112.1960	0.0352	0.0000	113.0758	
2024	0.4394	3.7321	3.8313	0.0102	0.5891	0.1376	0.7268	0.2019	0.1273	0.3293	0.0000	912.5218	912.5218	0.1762	0.0000	916.9263	
2025	0.4248	2.8579	3.8746	0.0125	0.6633	0.0742	0.7376	0.1798	0.0698	0.2495	0.0000	1,138.2659	1,138.2659	0.0978	0.0000	1,140.7116	
2026	0.4133	2.8349	3.7645	0.0123	0.6633	0.0741	0.7374	0.1798	0.0696	0.2494	0.0000	1,119.4062	1,119.4062	0.0967	0.0000	1,121.8230	
2027	0.4022	2.8136	3.6664	0.0121	0.6633	0.0738	0.7372	0.1798	0.0694	0.2491	0.0000	1,102.6740	1,102.6740	0.0956	0.0000	1,105.0643	
2028	0.3895	2.7851	3.5676	0.0119	0.6608	0.0732	0.7340	0.1791	0.0688	0.2479	0.0000	1,083.8765	1,083.8765	0.0943	0.0000	1,086.2343	
2029	0.3789	2.7786	3.4991	0.0118	0.6633	0.0733	0.7366	0.1798	0.0689	0.2486	0.0000	1,075.0350	1,075.0350	0.0938	0.0000	1,077.3800	
2030	0.3425	2.0524	3.3061	0.0114	0.6012	0.0254	0.6266	0.1629	0.0251	0.1880	0.0000	1,029.3387	1,029.3387	0.0336	0.0000	1,030.1796	
2031	26.0164	0.3570	0.8665	1.7500e-003	0.0527	0.0154	0.0681	0.0141	0.0154	0.0295	0.0000	152.2790	152.2790	5.9300e-003	0.0000	152.4272	
Maximum	26.0164	3.7321	3.8746	0.0125	0.6633	0.1376	0.7376	0.2019	0.1273	0.3293	0.0000	1,138.2659	1,138.2659	0.1762	0.0000	1,140.7116	

	ROG	NOx	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
Percent Reduction	0.00	0.00	0.00	0.00	14.06	0.00	12.75	18.88	0.00	14.37	0.00	0.00	0.00	0.00	0.00	0.00

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Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	10-3-2022	1-2-2023	0.0102	0.0102
5	10-3-2023	1-2-2024	1.0018	1.0018
6	1-3-2024	4-2-2024	1.1602	1.1602
7	4-3-2024	7-2-2024	1.1599	1.1599
8	7-3-2024	10-2-2024	0.9610	0.9610
9	10-3-2024	1-2-2025	0.8755	0.8755
10	1-3-2025	4-2-2025	0.8128	0.8128
11	4-3-2025	7-2-2025	0.8143	0.8143
12	7-3-2025	10-2-2025	0.8234	0.8234
13	10-3-2025	1-2-2026	0.8309	0.8309
14	1-3-2026	4-2-2026	0.8041	0.8041
15	4-3-2026	7-2-2026	0.8059	0.8059
16	7-3-2026	10-2-2026	0.8149	0.8149
17	10-3-2026	1-2-2027	0.8219	0.8219
18	1-3-2027	4-2-2027	0.7958	0.7958
19	4-3-2027	7-2-2027	0.7980	0.7980
20	7-3-2027	10-2-2027	0.8070	0.8070
21	10-3-2027	1-2-2028	0.8135	0.8135
22	1-3-2028	4-2-2028	0.7972	0.7972
23	4-3-2028	7-2-2028	0.7910	0.7910
24	7-3-2028	10-2-2028	0.7998	0.7998
25	10-3-2028	1-2-2029	0.8059	0.8059
26	1-3-2029	4-2-2029	0.7809	0.7809
27	4-3-2029	7-2-2029	0.7838	0.7838
28	7-3-2029	10-2-2029	0.7925	0.7925
29	10-3-2029	1-2-2030	0.7949	0.7949

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30	1-3-2030	4-2-2030	0.6261	0.6261
31	4-3-2030	7-2-2030	0.6277	0.6277
32	7-3-2030	10-2-2030	0.6347	0.6347
33	10-3-2030	1-2-2031	0.4958	0.4958
34	1-3-2031	4-2-2031	0.2749	0.2749
35	4-3-2031	7-2-2031	10.7229	10.7229
36	7-3-2031	9-30-2031	15.2006	15.2006
		Highest	15.2006	15.2006

2.2 Overall OperationalUnmitigated 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	9.5663	0.0657	5.6949	3.0000e-004		0.0317	0.0317		0.0317	0.0317	0.0000	9.3271	9.3271	8.8900e-003	0.0000	9.5493
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2,141.1868	2,141.1868	0.0620	0.0128	2,146.5592
Mobile	0.9692	6.7767	11.0221	0.0560	5.0567	0.0307	5.0873	1.3655	0.0286	1.3941	0.0000	5,205.1155	5,205.1155	0.2014	0.0000	5,210.1502
Waste						0.0000	0.0000		0.0000	0.0000	85.2927	0.0000	85.2927	5.0407	0.0000	211.3092
Water						0.0000	0.0000		0.0000	0.0000	17.7738	319.3870	337.1608	0.0704	0.0406	351.0099
Total	10.5355	6.8423	16.7170	0.0563	5.0567	0.0623	5.1190	1.3655	0.0602	1.4258	103.0666	7,675.0163	7,778.0829	5.3834	0.0534	7,928.577

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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	9.5663	0.0657	5.6949	3.0000e-004		0.0317	0.0317		0.0317	0.0317	0.0000	9.3271	9.3271	8.8900e-003	0.0000	9.5493	
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2,095.6022	2,095.6022	0.0607	0.0126	2,100.8602	
Mobile	0.9120	6.4511	9.7766	0.0488	4.3234	0.0268	4.3503	1.1675	0.0250	1.1925	0.0000	4,536.8477	4,536.8477	0.1823	0.0000	4,541.4051	
Waste						0.0000	0.0000		0.0000	0.0000	68.2342	0.0000	68.2342	4.0325	0.0000	169.0473	
Water						0.0000	0.0000		0.0000	0.0000	14.2191	270.6679	284.8869	0.0568	0.0325	296.0043	
Total	10.4783	6.5167	15.4714	0.0491	4.3234	0.0585	4.3819	1.1675	0.0566	1.2242	82.4532	6,912.4449	6,994.8981	4.3412	0.0451	7,116.8662	

	ROG	NOx	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
Percent Reduction	0.54	4.76	7.45	12.81	14.50	6.19	14.40	14.50	5.98	14.14	20.00	9.94	10.07	19.36	15.56	10.24

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2.3 VegetationVegetation

	CO2e
Category	MT
New Trees	212.4000
Vegetation Land Change	-356.9111
Total	-144.5111

3.0 Construction DetailConstruction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	10/3/2022	10/3/2022	5	1	
2	Site Preparation	Site Preparation	10/4/2023	12/26/2023	5	60	
3	Grading	Grading	12/27/2023	7/30/2024	5	155	
4	Building Construction	Building Construction	7/31/2024	11/26/2030	5	1650	
5	Paving	Paving	11/27/2030	4/29/2031	5	110	
6	Architectural Coating	Architectural Coating	5/1/2031	10/1/2031	5	110	

Acres of Grading (Site Preparation Phase): 82.81**Acres of Grading (Grading Phase): 387.5****Acres of Paving: 0**

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Residential Indoor: 2,871,450; Residential Outdoor: 957,150; Non-Residential Indoor: 486,054; Non-Residential Outdoor: 162,018; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Demolition	Excavators	3	8.00	158	0.38
Demolition	Rubber Tired Dozers	2	8.00	247	0.40
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

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Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	6	15.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	7	18.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Grading	8	20.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	597.00	114.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	119.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Soil Stabilizer

Replace Ground Cover

Water Exposed Area

Reduce Vehicle Speed on Unpaved Roads

3.2 Demolition - 2022Unmitigated 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	1.3200e-003	0.0129	0.0103	2.0000e-005		6.2000e-004	6.2000e-004		5.8000e-004	5.8000e-004	0.0000	1.6995	1.6995	4.8000e-004	0.0000	1.7115		
Total	1.3200e-003	0.0129	0.0103	2.0000e-005		6.2000e-004	6.2000e-004		5.8000e-004	5.8000e-004	0.0000	1.6995	1.6995	4.8000e-004	0.0000	1.7115		

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3.2 Demolition - 2022**Unmitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e	
Category	tons/yr											MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	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	2.0000e-005	2.0000e-005	1.8000e-004	0.0000	6.0000e-005	0.0000	6.0000e-005	1.0000e-005	0.0000	2.0000e-005	0.0000	0.0501	0.0501	0.0000	0.0000	0.0501	
Total	2.0000e-005	2.0000e-005	1.8000e-004	0.0000	6.0000e-005	0.0000	6.0000e-005	1.0000e-005	0.0000	2.0000e-005	0.0000	0.0501	0.0501	0.0000	0.0000	0.0501	

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	1.3200e-003	0.0129	0.0103	2.0000e-005		6.2000e-004	6.2000e-004		5.8000e-004	5.8000e-004	0.0000	1.6995	1.6995	4.8000e-004	0.0000	1.7114	
Total	1.3200e-003	0.0129	0.0103	2.0000e-005		6.2000e-004	6.2000e-004		5.8000e-004	5.8000e-004	0.0000	1.6995	1.6995	4.8000e-004	0.0000	1.7114	

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3.2 Demolition - 2022**Mitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e	
Category	tons/yr											MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	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	2.0000e-005	2.0000e-005	1.8000e-004	0.0000	6.0000e-005	0.0000	6.0000e-005	1.0000e-005	0.0000	2.0000e-005	0.0000	0.0501	0.0501	0.0000	0.0000	0.0501	
Total	2.0000e-005	2.0000e-005	1.8000e-004	0.0000	6.0000e-005	0.0000	6.0000e-005	1.0000e-005	0.0000	2.0000e-005	0.0000	0.0501	0.0501	0.0000	0.0000	0.0501	

3.3 Site Preparation - 2023**Unmitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.5859	0.0000	0.5859	0.3027	0.0000	0.3027	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0798	0.8257	0.5473	1.1400e-003		0.0380	0.0380		0.0349	0.0349	0.0000	100.3521	100.3521	0.0325	0.0000	101.1635
Total	0.0798	0.8257	0.5473	1.1400e-003	0.5859	0.0380	0.6239	0.3027	0.0349	0.3376	0.0000	100.3521	100.3521	0.0325	0.0000	101.1635

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3.3 Site Preparation - 2023**Unmitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e	
Category	tons/yr											MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	
Worker	1.6800e-003	1.1100e-003	0.0122	4.0000e-005	3.9600e-003	3.0000e-005	3.9900e-003	1.0600e-003	3.0000e-005	1.0900e-003	0.0000	3.4709	3.4709	9.0000e-005	0.0000	3.4731	
Total	1.6800e-003	1.1100e-003	0.0122	4.0000e-005	3.9600e-003	3.0000e-005	3.9900e-003	1.0600e-003	3.0000e-005	1.0900e-003	0.0000	3.4709	3.4709	9.0000e-005	0.0000	3.4731	

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					0.2637	0.0000	0.2637	0.1362	0.0000	0.1362	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	
Off-Road	0.0798	0.8257	0.5473	1.1400e-003		0.0380	0.0380		0.0349	0.0349	0.0000	100.3520	100.3520	0.0325	0.0000	101.1634	
Total	0.0798	0.8257	0.5473	1.1400e-003	0.2637	0.0380	0.3016	0.1362	0.0349	0.1711	0.0000	100.3520	100.3520	0.0325	0.0000	101.1634	

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3.3 Site Preparation - 2023**Mitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e	
Category	tons/yr											MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	
Worker	1.6800e-003	1.1100e-003	0.0122	4.0000e-005	3.9600e-003	3.0000e-005	3.9900e-003	1.0600e-003	3.0000e-005	1.0900e-003	0.0000	3.4709	3.4709	9.0000e-005	0.0000	3.4731	
Total	1.6800e-003	1.1100e-003	0.0122	4.0000e-005	3.9600e-003	3.0000e-005	3.9900e-003	1.0600e-003	3.0000e-005	1.0900e-003	0.0000	3.4709	3.4709	9.0000e-005	0.0000	3.4731	

3.4 Grading - 2023**Unmitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.2145	0.0000	0.2145	0.0272	0.0000	0.0272	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	4.9800e-003	0.0518	0.0421	9.0000e-005		2.1400e-003	2.1400e-003		1.9700e-003	1.9700e-003	0.0000	8.1803	8.1803	2.6500e-003	0.0000	8.2464
Total	4.9800e-003	0.0518	0.0421	9.0000e-005	0.2145	2.1400e-003	0.2167	0.0272	1.9700e-003	0.0291	0.0000	8.1803	8.1803	2.6500e-003	0.0000	8.2464

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3.4 Grading - 2023**Unmitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e	
Category	tons/yr										MT/yr						
Hauling	0.0000	0.0000	0.0000	0.0000	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	9.0000e-005	6.0000e-005	6.8000e-004	0.0000	2.2000e-004	0.0000	2.2000e-004	6.0000e-005	0.0000	6.0000e-005	0.0000	0.1928	0.1928	0.0000	0.0000	0.1930	
Total	9.0000e-005	6.0000e-005	6.8000e-004	0.0000	2.2000e-004	0.0000	2.2000e-004	6.0000e-005	0.0000	6.0000e-005	0.0000	0.1928	0.1928	0.0000	0.0000	0.1930	

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e	
Category	tons/yr										MT/yr						
Fugitive Dust	0.0000	0.0000	0.0000	0.0000	0.0965	0.0000	0.0965	0.0122	0.0000	0.0122	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	
Off-Road	4.9800e-003	0.0518	0.0421	9.0000e-005	0.0965	2.1400e-003	2.1400e-003	0.0122	1.9700e-003	1.9700e-003	0.0000	8.1803	8.1803	2.6500e-003	0.0000	8.2464	
Total	4.9800e-003	0.0518	0.0421	9.0000e-005	0.0965	2.1400e-003	0.0987	0.0122	1.9700e-003	0.0142	0.0000	8.1803	8.1803	2.6500e-003	0.0000	8.2464	

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3.4 Grading - 2023**Mitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e	
Category	tons/yr										MT/yr						
Hauling	0.0000	0.0000	0.0000	0.0000	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	9.0000e-005	6.0000e-005	6.8000e-004	0.0000	2.2000e-004	0.0000	2.2000e-004	6.0000e-005	0.0000	6.0000e-005	0.0000	0.1928	0.1928	0.0000	0.0000	0.1930	
Total	9.0000e-005	6.0000e-005	6.8000e-004	0.0000	2.2000e-004	0.0000	2.2000e-004	6.0000e-005	0.0000	6.0000e-005	0.0000	0.1928	0.1928	0.0000	0.0000	0.1930	

3.4 Grading - 2024**Unmitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e	
Category	tons/yr										MT/yr						
Fugitive Dust					0.6632	0.0000	0.6632	0.2738	0.0000	0.2738	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	
Off-Road	0.2446	2.4607	2.1069	4.7200e-003		0.1015	0.1015		0.0934	0.0934	0.0000	414.3484	414.3484	0.1340	0.0000	417.6986	
Total	0.2446	2.4607	2.1069	4.7200e-003	0.6632	0.1015	0.7646	0.2738	0.0934	0.3671	0.0000	414.3484	414.3484	0.1340	0.0000	417.6986	

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3.4 Grading - 2024**Unmitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e	
Category	tons/yr											MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	
Worker	4.4500e-003	2.8200e-003	0.0318	1.0000e-004	0.0112	8.0000e-005	0.0112	2.9800e-003	8.0000e-005	3.0600e-003	0.0000	9.4171	9.4171	2.2000e-004	0.0000	9.4225	
Total	4.4500e-003	2.8200e-003	0.0318	1.0000e-004	0.0112	8.0000e-005	0.0112	2.9800e-003	8.0000e-005	3.0600e-003	0.0000	9.4171	9.4171	2.2000e-004	0.0000	9.4225	

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					0.2984	0.0000	0.2984	0.1232	0.0000	0.1232	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	
Off-Road	0.2446	2.4607	2.1069	4.7200e-003		0.1015	0.1015		0.0934	0.0934	0.0000	414.3479	414.3479	0.1340	0.0000	417.6981	
Total	0.2446	2.4607	2.1069	4.7200e-003	0.2984	0.1015	0.3999	0.1232	0.0934	0.2166	0.0000	414.3479	414.3479	0.1340	0.0000	417.6981	

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3.4 Grading - 2024**Mitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e	
Category	tons/yr											MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	
Worker	4.4500e-003	2.8200e-003	0.0318	1.0000e-004	0.0112	8.0000e-005	0.0112	2.9800e-003	8.0000e-005	3.0600e-003	0.0000	9.4171	9.4171	2.2000e-004	0.0000	9.4225	
Total	4.4500e-003	2.8200e-003	0.0318	1.0000e-004	0.0112	8.0000e-005	0.0112	2.9800e-003	8.0000e-005	3.0600e-003	0.0000	9.4171	9.4171	2.2000e-004	0.0000	9.4225	

3.5 Building Construction - 2024**Unmitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e	
Category	tons/yr											MT/yr					
Off-Road	0.0809	0.7394	0.8892	1.4800e-003		0.0337	0.0337		0.0317	0.0317	0.0000	127.5170	127.5170	0.0302	0.0000	128.2709	
Total	0.0809	0.7394	0.8892	1.4800e-003		0.0337	0.0337		0.0317	0.0317	0.0000	127.5170	127.5170	0.0302	0.0000	128.2709	

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3.5 Building Construction - 2024**Unmitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e	
Category	tons/yr											MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	
Vendor	0.0132	0.4683	0.1169	1.6400e-003	0.0387	5.3000e-004	0.0393	0.0113	5.1000e-004	0.0118	0.0000	157.8129	157.8129	7.1000e-003	0.0000	157.9905	
Worker	0.0962	0.0610	0.6865	2.2500e-003	0.2408	1.7800e-003	0.2426	0.0645	1.6300e-003	0.0661	0.0000	203.4270	203.4270	4.7000e-003	0.0000	203.5445	
Total	0.1095	0.5292	0.8034	3.8900e-003	0.2796	2.3100e-003	0.2819	0.0758	2.1400e-003	0.0779	0.0000	361.2400	361.2400	0.0118	0.0000	361.5350	

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	0.0809	0.7394	0.8892	1.4800e-003			0.0337	0.0337		0.0317	0.0317	0.0000	127.5169	127.5169	0.0302	0.0000	128.2707
Total	0.0809	0.7394	0.8892	1.4800e-003			0.0337	0.0337		0.0317	0.0317	0.0000	127.5169	127.5169	0.0302	0.0000	128.2707

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3.5 Building Construction - 2024**Mitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e	
Category	tons/yr											MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	
Vendor	0.0132	0.4683	0.1169	1.6400e-003	0.0387	5.3000e-004	0.0393	0.0113	5.1000e-004	0.0118	0.0000	157.8129	157.8129	7.1000e-003	0.0000	157.9905	
Worker	0.0962	0.0610	0.6865	2.2500e-003	0.2408	1.7800e-003	0.2426	0.0645	1.6300e-003	0.0661	0.0000	203.4270	203.4270	4.7000e-003	0.0000	203.5445	
Total	0.1095	0.5292	0.8034	3.8900e-003	0.2796	2.3100e-003	0.2819	0.0758	2.1400e-003	0.0779	0.0000	361.2400	361.2400	0.0118	0.0000	361.5350	

3.5 Building Construction - 2025**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	0.1785	1.6273	2.0991	3.5200e-003		0.0689	0.0689		0.0648	0.0648	0.0000	302.6549	302.6549	0.0711	0.0000	304.4335	
Total	0.1785	1.6273	2.0991	3.5200e-003		0.0689	0.0689		0.0648	0.0648	0.0000	302.6549	302.6549	0.0711	0.0000	304.4335	

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3.5 Building Construction - 2025**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	0.0305	1.0988	0.2669	3.8800e-003	0.0919	1.2400e-003	0.0932	0.0268	1.1800e-003	0.0280	0.0000	372.0926	372.0926	0.0166	0.0000	372.5065	
Worker	0.2159	0.1318	1.5087	5.1200e-003	0.5714	4.1300e-003	0.5756	0.1529	3.8000e-003	0.1567	0.0000	463.5188	463.5188	0.0101	0.0000	463.7719	
Total	0.2464	1.2306	1.7756	9.0000e-003	0.6633	5.3700e-003	0.6687	0.1798	4.9800e-003	0.1848	0.0000	835.6114	835.6114	0.0267	0.0000	836.2784	

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	0.1784	1.6273	2.0991	3.5200e-003			0.0689	0.0689		0.0648	0.0648	0.0000	302.6545	302.6545	0.0711	0.0000	304.4331
Total	0.1784	1.6273	2.0991	3.5200e-003			0.0689	0.0689		0.0648	0.0648	0.0000	302.6545	302.6545	0.0711	0.0000	304.4331

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3.5 Building Construction - 2025**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	0.0305	1.0988	0.2669	3.8800e-003	0.0919	1.2400e-003	0.0932	0.0268	1.1800e-003	0.0280	0.0000	372.0926	372.0926	0.0166	0.0000	372.5065	
Worker	0.2159	0.1318	1.5087	5.1200e-003	0.5714	4.1300e-003	0.5756	0.1529	3.8000e-003	0.1567	0.0000	463.5188	463.5188	0.0101	0.0000	463.7719	
Total	0.2464	1.2306	1.7756	9.0000e-003	0.6633	5.3700e-003	0.6687	0.1798	4.9800e-003	0.1848	0.0000	835.6114	835.6114	0.0267	0.0000	836.2784	

3.5 Building Construction - 2026**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	0.1785	1.6273	2.0991	3.5200e-003			0.0689	0.0689		0.0648	0.0648	0.0000	302.6549	302.6549	0.0711	0.0000	304.4335
Total	0.1785	1.6273	2.0991	3.5200e-003			0.0689	0.0689		0.0648	0.0648	0.0000	302.6549	302.6549	0.0711	0.0000	304.4335

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3.5 Building Construction - 2026**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	0.0297	1.0867	0.2589	3.8500e-003	0.0919	1.2100e-003	0.0931	0.0268	1.1500e-003	0.0280	0.0000	369.9234	369.9234	0.0163	0.0000	370.3302	
Worker	0.2052	0.1209	1.4066	4.9400e-003	0.5714	4.0000e-003	0.5754	0.1529	3.6800e-003	0.1566	0.0000	446.8283	446.8283	9.2500e-003	0.0000	447.0596	
Total	0.2349	1.2076	1.6655	8.7900e-003	0.6633	5.2100e-003	0.6686	0.1798	4.8300e-003	0.1846	0.0000	816.7517	816.7517	0.0255	0.0000	817.3898	

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	0.1784	1.6273	2.0991	3.5200e-003		0.0689	0.0689		0.0648	0.0648	0.0000	302.6545	302.6545	0.0711	0.0000	304.4331	
Total	0.1784	1.6273	2.0991	3.5200e-003		0.0689	0.0689		0.0648	0.0648	0.0000	302.6545	302.6545	0.0711	0.0000	304.4331	

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3.5 Building Construction - 2026**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	0.0297	1.0867	0.2589	3.8500e-003	0.0919	1.2100e-003	0.0931	0.0268	1.1500e-003	0.0280	0.0000	369.9234	369.9234	0.0163	0.0000	370.3302	
Worker	0.2052	0.1209	1.4066	4.9400e-003	0.5714	4.0000e-003	0.5754	0.1529	3.6800e-003	0.1566	0.0000	446.8283	446.8283	9.2500e-003	0.0000	447.0596	
Total	0.2349	1.2076	1.6655	8.7900e-003	0.6633	5.2100e-003	0.6686	0.1798	4.8300e-003	0.1846	0.0000	816.7517	816.7517	0.0255	0.0000	817.3898	

3.5 Building Construction - 2027**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	0.1785	1.6273	2.0991	3.5200e-003		0.0689	0.0689		0.0648	0.0648	0.0000	302.6549	302.6549	0.0711	0.0000	304.4335	
Total	0.1785	1.6273	2.0991	3.5200e-003		0.0689	0.0689		0.0648	0.0648	0.0000	302.6549	302.6549	0.0711	0.0000	304.4335	

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3.5 Building Construction - 2027**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	0.0290	1.0752	0.2522	3.8300e-003	0.0919	1.1800e-003	0.0931	0.0268	1.1300e-003	0.0280	0.0000	368.0028	368.0028	0.0160	0.0000	368.4027	
Worker	0.1948	0.1112	1.3152	4.7700e-003	0.5714	3.7900e-003	0.5752	0.1529	3.4900e-003	0.1564	0.0000	432.0166	432.0166	8.4700e-003	0.0000	432.2284	
Total	0.2238	1.1864	1.5674	8.6000e-003	0.6633	4.9700e-003	0.6683	0.1798	4.6200e-003	0.1844	0.0000	800.0195	800.0195	0.0245	0.0000	800.6311	

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	0.1784	1.6273	2.0991	3.5200e-003		0.0689	0.0689		0.0648	0.0648	0.0000	302.6545	302.6545	0.0711	0.0000	304.4331	
Total	0.1784	1.6273	2.0991	3.5200e-003		0.0689	0.0689		0.0648	0.0648	0.0000	302.6545	302.6545	0.0711	0.0000	304.4331	

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3.5 Building Construction - 2027**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	0.0290	1.0752	0.2522	3.8300e-003	0.0919	1.1800e-003	0.0931	0.0268	1.1300e-003	0.0280	0.0000	368.0028	368.0028	0.0160	0.0000	368.4027	
Worker	0.1948	0.1112	1.3152	4.7700e-003	0.5714	3.7900e-003	0.5752	0.1529	3.4900e-003	0.1564	0.0000	432.0166	432.0166	8.4700e-003	0.0000	432.2284	
Total	0.2238	1.1864	1.5674	8.6000e-003	0.6633	4.9700e-003	0.6683	0.1798	4.6200e-003	0.1844	0.0000	800.0195	800.0195	0.0245	0.0000	800.6311	

3.5 Building Construction - 2028**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	0.1778	1.6211	2.0910	3.5000e-003		0.0686	0.0686		0.0645	0.0645	0.0000	301.4953	301.4953	0.0709	0.0000	303.2671	
Total	0.1778	1.6211	2.0910	3.5000e-003		0.0686	0.0686		0.0645	0.0645	0.0000	301.4953	301.4953	0.0709	0.0000	303.2671	

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3.5 Building Construction - 2028**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	0.0284	1.0620	0.2460	3.8000e-003	0.0916	1.1500e-003	0.0927	0.0267	1.1000e-003	0.0278	0.0000	365.0342	365.0342	0.0157	0.0000	365.4258	
Worker	0.1834	0.1021	1.2306	4.6100e-003	0.5692	3.5000e-003	0.5727	0.1523	3.2200e-003	0.1556	0.0000	417.3474	417.3474	7.7800e-003	0.0000	417.5418	
Total	0.2118	1.1641	1.4766	8.4100e-003	0.6608	4.6500e-003	0.6655	0.1791	4.3200e-003	0.1834	0.0000	782.3816	782.3816	0.0234	0.0000	782.9676	

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	0.1778	1.6211	2.0910	3.5000e-003		0.0686	0.0686		0.0645	0.0645	0.0000	301.4949	301.4949	0.0709	0.0000	303.2667	
Total	0.1778	1.6211	2.0910	3.5000e-003		0.0686	0.0686		0.0645	0.0645	0.0000	301.4949	301.4949	0.0709	0.0000	303.2667	

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3.5 Building Construction - 2028**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	0.0284	1.0620	0.2460	3.8000e-003	0.0916	1.1500e-003	0.0927	0.0267	1.1000e-003	0.0278	0.0000	365.0342	365.0342	0.0157	0.0000	365.4258	
Worker	0.1834	0.1021	1.2306	4.6100e-003	0.5692	3.5000e-003	0.5727	0.1523	3.2200e-003	0.1556	0.0000	417.3474	417.3474	7.7800e-003	0.0000	417.5418	
Total	0.2118	1.1641	1.4766	8.4100e-003	0.6608	4.6500e-003	0.6655	0.1791	4.3200e-003	0.1834	0.0000	782.3816	782.3816	0.0234	0.0000	782.9676	

3.5 Building Construction - 2029**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	0.1785	1.6273	2.0991	3.5200e-003		0.0689	0.0689		0.0648	0.0648	0.0000	302.6549	302.6549	0.0711	0.0000	304.4335	
Total	0.1785	1.6273	2.0991	3.5200e-003		0.0689	0.0689		0.0648	0.0648	0.0000	302.6549	302.6549	0.0711	0.0000	304.4335	

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3.5 Building Construction - 2029**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	0.0280	1.0570	0.2422	3.8000e-003	0.0919	1.1400e-003	0.0931	0.0268	1.0900e-003	0.0279	0.0000	364.9917	364.9917	0.0155	0.0000	365.3790	
Worker	0.1725	0.0943	1.1579	4.5000e-003	0.5714	3.2700e-003	0.5747	0.1529	3.0100e-003	0.1559	0.0000	407.3887	407.3887	7.1600e-003	0.0000	407.5678	
Total	0.2004	1.1513	1.4001	8.3000e-003	0.6633	4.4100e-003	0.6678	0.1798	4.1000e-003	0.1839	0.0000	772.3805	772.3805	0.0227	0.0000	772.9468	

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	0.1784	1.6273	2.0991	3.5200e-003		0.0689	0.0689		0.0648	0.0648	0.0000	302.6545	302.6545	0.0711	0.0000	304.4331	
Total	0.1784	1.6273	2.0991	3.5200e-003		0.0689	0.0689		0.0648	0.0648	0.0000	302.6545	302.6545	0.0711	0.0000	304.4331	

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3.5 Building Construction - 2029**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	0.0280	1.0570	0.2422	3.8000e-003	0.0919	1.1400e-003	0.0931	0.0268	1.0900e-003	0.0279	0.0000	364.9917	364.9917	0.0155	0.0000	365.3790	
Worker	0.1725	0.0943	1.1579	4.5000e-003	0.5714	3.2700e-003	0.5747	0.1529	3.0100e-003	0.1559	0.0000	407.3887	407.3887	7.1600e-003	0.0000	407.5678	
Total	0.2004	1.1513	1.4001	8.3000e-003	0.6633	4.4100e-003	0.6678	0.1798	4.1000e-003	0.1839	0.0000	772.3805	772.3805	0.0227	0.0000	772.9468	

3.5 Building Construction - 2030**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	0.1545	0.9363	1.9065	3.6500e-003		0.0175	0.0175		0.0175	0.0175	0.0000	310.1760	310.1760	0.0124	0.0000	310.4871	
Total	0.1545	0.9363	1.9065	3.6500e-003		0.0175	0.0175		0.0175	0.0175	0.0000	310.1760	310.1760	0.0124	0.0000	310.4871	

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3.5 Building Construction - 2030**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	0.0249	0.9486	0.2157	3.4200e-003	0.0831	1.0100e-003	0.0841	0.0243	9.6000e-004	0.0252	0.0000	328.9604	328.9604	0.0138	0.0000	329.3057	
Worker	0.1454	0.0784	0.9832	3.9700e-003	0.5167	2.7500e-003	0.5194	0.1383	2.5300e-003	0.1408	0.0000	359.1225	359.1225	5.9500e-003	0.0000	359.2713	
Total	0.1703	1.0269	1.1989	7.3900e-003	0.5998	3.7600e-003	0.6036	0.1626	3.4900e-003	0.1660	0.0000	688.0828	688.0828	0.0198	0.0000	688.5770	

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	0.1545	0.9363	1.9065	3.6500e-003			0.0175	0.0175		0.0175	0.0175	0.0000	310.1756	310.1756	0.0124	0.0000	310.4867
Total	0.1545	0.9363	1.9065	3.6500e-003			0.0175	0.0175		0.0175	0.0175	0.0000	310.1756	310.1756	0.0124	0.0000	310.4867

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3.5 Building Construction - 2030**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	0.0249	0.9486	0.2157	3.4200e-003	0.0831	1.0100e-003	0.0841	0.0243	9.6000e-004	0.0252	0.0000	328.9604	328.9604	0.0138	0.0000	329.3057	
Worker	0.1454	0.0784	0.9832	3.9700e-003	0.5167	2.7500e-003	0.5194	0.1383	2.5300e-003	0.1408	0.0000	359.1225	359.1225	5.9500e-003	0.0000	359.2713	
Total	0.1703	1.0269	1.1989	7.3900e-003	0.5998	3.7600e-003	0.6036	0.1626	3.4900e-003	0.1660	0.0000	688.0828	688.0828	0.0198	0.0000	688.5770	

3.6 Paving - 2030**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	0.0173	0.0890	0.1981	3.5000e-004		4.1300e-003	4.1300e-003		4.1300e-003	4.1300e-003	0.0000	30.1244	30.1244	1.4100e-003	0.0000	30.1597
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0173	0.0890	0.1981	3.5000e-004		4.1300e-003	4.1300e-003		4.1300e-003	4.1300e-003	0.0000	30.1244	30.1244	1.4100e-003	0.0000	30.1597

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3.6 Paving - 2030**Unmitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e	
Category	tons/yr											MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	
Worker	3.9000e-004	2.1000e-004	2.6200e-003	1.0000e-005	1.3800e-003	1.0000e-005	1.3800e-003	3.7000e-004	1.0000e-005	3.7000e-004	0.0000	0.9559	0.9559	2.0000e-005	0.0000	0.9562	
Total	3.9000e-004	2.1000e-004	2.6200e-003	1.0000e-005	1.3800e-003	1.0000e-005	1.3800e-003	3.7000e-004	1.0000e-005	3.7000e-004	0.0000	0.9559	0.9559	2.0000e-005	0.0000	0.9562	

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	0.0173	0.0890	0.1981	3.5000e-004		4.1300e-003	4.1300e-003		4.1300e-003	4.1300e-003	0.0000	30.1244	30.1244	1.4100e-003	0.0000	30.1597
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0173	0.0890	0.1981	3.5000e-004		4.1300e-003	4.1300e-003		4.1300e-003	4.1300e-003	0.0000	30.1244	30.1244	1.4100e-003	0.0000	30.1597

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3.6 Paving - 2030**Mitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e	
Category	tons/yr											MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	
Worker	3.9000e-004	2.1000e-004	2.6200e-003	1.0000e-005	1.3800e-003	1.0000e-005	1.3800e-003	3.7000e-004	1.0000e-005	3.7000e-004	0.0000	0.9559	0.9559	2.0000e-005	0.0000	0.9562	
Total	3.9000e-004	2.1000e-004	2.6200e-003	1.0000e-005	1.3800e-003	1.0000e-005	1.3800e-003	3.7000e-004	1.0000e-005	3.7000e-004	0.0000	0.9559	0.9559	2.0000e-005	0.0000	0.9562	

3.6 Paving - 2031**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	0.0588	0.3026	0.6736	1.1900e-003		0.0141	0.0141		0.0141	0.0141	0.0000	102.4229	102.4229	4.8000e-003	0.0000	102.5430
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0588	0.3026	0.6736	1.1900e-003		0.0141	0.0141		0.0141	0.0141	0.0000	102.4229	102.4229	4.8000e-003	0.0000	102.5430

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3.6 Paving - 2031**Unmitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e	
Category	tons/yr											MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	
Worker	1.2100e-003	6.5000e-004	8.3500e-003	4.0000e-005	4.6800e-003	2.0000e-005	4.7000e-003	1.2500e-003	2.0000e-005	1.2700e-003	0.0000	3.1787	3.1787	5.0000e-005	0.0000	3.1799	
Total	1.2100e-003	6.5000e-004	8.3500e-003	4.0000e-005	4.6800e-003	2.0000e-005	4.7000e-003	1.2500e-003	2.0000e-005	1.2700e-003	0.0000	3.1787	3.1787	5.0000e-005	0.0000	3.1799	

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	0.0588	0.3026	0.6736	1.1900e-003			0.0141	0.0141		0.0141	0.0141	0.0000	102.4228	102.4228	4.8000e-003	0.0000	102.5429
Paving	0.0000						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	
Total	0.0588	0.3026	0.6736	1.1900e-003			0.0141	0.0141		0.0141	0.0141	0.0000	102.4228	102.4228	4.8000e-003	0.0000	102.5429

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3.6 Paving - 2031**Mitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e	
Category	tons/yr											MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	
Worker	1.2100e-003	6.5000e-004	8.3500e-003	4.0000e-005	4.6800e-003	2.0000e-005	4.7000e-003	1.2500e-003	2.0000e-005	1.2700e-003	0.0000	3.1787	3.1787	5.0000e-005	0.0000	3.1799	
Total	1.2100e-003	6.5000e-004	8.3500e-003	4.0000e-005	4.6800e-003	2.0000e-005	4.7000e-003	1.2500e-003	2.0000e-005	1.2700e-003	0.0000	3.1787	3.1787	5.0000e-005	0.0000	3.1799	

3.7 Architectural Coating - 2031**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	25.9367						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	7.1900e-003	0.0471	0.0989	1.6000e-004		1.1200e-003	1.1200e-003		1.1200e-003	1.1200e-003	0.0000	14.0429	14.0429	5.7000e-004	0.0000	14.0571
Total	25.9439	0.0471	0.0989	1.6000e-004		1.1200e-003	1.1200e-003		1.1200e-003	1.1200e-003	0.0000	14.0429	14.0429	5.7000e-004	0.0000	14.0571

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3.7 Architectural Coating - 2031**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	0.0125	6.6600e-003	0.0857	3.6000e-004	0.0480	2.4000e-004	0.0482	0.0129	2.2000e-004	0.0131	0.0000	32.6346	32.6346	5.1000e-004	0.0000	32.6473	
Total	0.0125	6.6600e-003	0.0857	3.6000e-004	0.0480	2.4000e-004	0.0482	0.0129	2.2000e-004	0.0131	0.0000	32.6346	32.6346	5.1000e-004	0.0000	32.6473	

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	25.9367						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	
Off-Road	7.1900e-003	0.0471	0.0989	1.6000e-004		1.1200e-003	1.1200e-003		1.1200e-003	1.1200e-003	0.0000	14.0429	14.0429	5.7000e-004	0.0000	14.0571	
Total	25.9439	0.0471	0.0989	1.6000e-004		1.1200e-003	1.1200e-003		1.1200e-003	1.1200e-003	0.0000	14.0429	14.0429	5.7000e-004	0.0000	14.0571	

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3.7 Architectural Coating - 2031**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	0.0125	6.6600e-003	0.0857	3.6000e-004	0.0480	2.4000e-004	0.0482	0.0129	2.2000e-004	0.0131	0.0000	32.6346	32.6346	5.1000e-004	0.0000	32.6473	
Total	0.0125	6.6600e-003	0.0857	3.6000e-004	0.0480	2.4000e-004	0.0482	0.0129	2.2000e-004	0.0131	0.0000	32.6346	32.6346	5.1000e-004	0.0000	32.6473	

4.0 Operational Detail - Mobile**4.1 Mitigation Measures Mobile**

Increase Density

Increase Diversity

Improve Walkability Design

Improve Destination Accessibility

Increase Transit Accessibility

Integrate Below Market Rate Housing

Improve Pedestrian Network

Provide Traffic Calming Measures

Expand Transit Network

Implement School Bus Program

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	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.9120	6.4511	9.7766	0.0488	4.3234	0.0268	4.3503	1.1675	0.0250	1.1925	0.0000	4,536.847	4,536.847	0.1823	0.0000	4,541.405
Unmitigated	0.9692	6.7767	11.0221	0.0560	5.0567	0.0307	5.0873	1.3655	0.0286	1.3941	0.0000	5,205.1155	5,205.1155	0.2014	0.0000	5,210.150

4.2 Trip Summary Information

Land Use	Average Daily Trip Rate			Unmitigated	Mitigated
	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Apartments Low Rise	1,522.29	1,653.96	1402.17	4,347,569	3,717,172
City Park	1.89	22.75	16.74	14,926	12,761
Condo/Townhouse	2,626.12	2,562.84	2187.68	7,287,446	6,230,766
Convenience Market (24 Hour)	737.99	863.10	758.45	577,874	494,082
Recreational Swimming Pool	33.82	9.10	13.60	49,519	42,339
Single Family Housing	342.72	356.76	310.32	970,246	829,560
Single Family Housing	476.00	495.50	431.00	1,347,563	1,152,167
Total	5,740.83	5,964.01	5,119.96	14,595,143	12,478,847

4.3 Trip Type Information

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Land Use	Miles			Trip %			Trip Purpose %		
	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Apartments Low Rise	10.80	7.30	7.50	41.40	19.30	39.30	86	11	3
City Park	9.50	7.30	7.30	33.00	48.00	19.00	66	28	6
Condo/Townhouse	10.80	7.30	7.50	41.40	19.30	39.30	86	11	3
Convenience Market (24 Hour)	9.50	7.30	7.30	0.90	80.10	19.00	24	15	61
Recreational Swimming Pool	9.50	7.30	7.30	33.00	48.00	19.00	52	39	9
Single Family Housing	10.80	7.30	7.50	41.40	19.30	39.30	86	11	3
Single Family Housing	10.80	7.30	7.50	41.40	19.30	39.30	86	11	3

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Apartments Low Rise	0.566993	0.036471	0.195999	0.104620	0.012045	0.005044	0.020401	0.048153	0.002146	0.001482	0.005176	0.000799	0.000671
City Park	0.566993	0.036471	0.195999	0.104620	0.012045	0.005044	0.020401	0.048153	0.002146	0.001482	0.005176	0.000799	0.000671
Condo/Townhouse	0.566993	0.036471	0.195999	0.104620	0.012045	0.005044	0.020401	0.048153	0.002146	0.001482	0.005176	0.000799	0.000671
Convenience Market (24 Hour)	0.566993	0.036471	0.195999	0.104620	0.012045	0.005044	0.020401	0.048153	0.002146	0.001482	0.005176	0.000799	0.000671
Recreational Swimming Pool	0.566993	0.036471	0.195999	0.104620	0.012045	0.005044	0.020401	0.048153	0.002146	0.001482	0.005176	0.000799	0.000671
Single Family Housing	0.566993	0.036471	0.195999	0.104620	0.012045	0.005044	0.020401	0.048153	0.002146	0.001482	0.005176	0.000799	0.000671

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

Install High Efficiency Lighting

Kilowatt Hours of Renewable Electricity Generated

Install Energy Efficient Appliances

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5.2 Energy by Land Use - NaturalGas

Unmitigated

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5.2 Energy by Land Use - NaturalGas

Mitigated

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5.3 Energy by Land Use - Electricity**Unmitigated**

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Apartments Low Rise	980359	445.3817	0.0129	2.6700e-003	446.4992
City Park	0	0.0000	0.0000	0.0000	0.0000
Condo/Townhouse	2.27055e+006	1,031.5189	0.0299	6.1800e-003	1,034.1071
Convenience Market (24 Hour)	765959	347.9787	0.0101	2.0800e-003	348.8518
Recreational Swimming Pool	0	0.0000	0.0000	0.0000	0.0000
Single Family Housing	291452	132.4078	3.8300e-003	7.9000e-004	132.7400
Single Family Housing	404794	183.8997	5.3200e-003	1.1000e-003	184.3612
Total		2,141.1868	0.0620	0.0128	2,146.5592

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5.3 Energy by Land Use - Electricity**Mitigated**

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Apartments Low Rise	954979	433.8515	0.0126	2.6000e-003	434.9400
City Park	-168.571	-0.0766	0.0000	0.0000	-0.0768
Condo/Townhouse	2.21089e+006	1,004.4156	0.0291	6.0200e-003	1,006.9357
Convenience Market (24 Hour)	765790	347.9021	0.0101	2.0800e-003	348.7750
Recreational Swimming Pool	-168.571	-0.0766	0.0000	0.0000	-0.0768
Single Family Housing	285231	129.5818	3.7500e-003	7.8000e-004	129.9069
Single Family Housing	396220	180.0045	5.2100e-003	1.0800e-003	180.4561
Total		2,095.6022	0.0607	0.0126	2,100.8602

6.0 Area Detail**6.1 Mitigation Measures Area**

No Hearths Installed

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	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e	
Category	tons/yr											MT/yr					
Mitigated	9.5663	0.0657	5.6949	3.0000e-004		0.0317	0.0317		0.0317	0.0317	0.0000	9.3271	9.3271	8.8900e-003	0.0000	9.5493	
Unmitigated	9.5663	0.0657	5.6949	3.0000e-004		0.0317	0.0317		0.0317	0.0317	0.0000	9.3271	9.3271	8.8900e-003	0.0000	9.5493	

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	2.5937					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	6.8023					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.1703	0.0657	5.6949	3.0000e-004		0.0317	0.0317		0.0317	0.0317	0.0000	9.3271	9.3271	8.8900e-003	0.0000	9.5493
Total	9.5663	0.0657	5.6949	3.0000e-004		0.0317	0.0317		0.0317	0.0317	0.0000	9.3271	9.3271	8.8900e-003	0.0000	9.5493

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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	2.5937					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	
Consumer Products	6.8023					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	
Hearth	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	
Landscaping	0.1703	0.0657	5.6949	3.0000e-004		0.0317	0.0317		0.0317	0.0317	0.0000	9.3271	9.3271	8.8900e-003	0.0000	9.5493	
Total	9.5663	0.0657	5.6949	3.0000e-004		0.0317	0.0317		0.0317	0.0317	0.0000	9.3271	9.3271	8.8900e-003	0.0000	9.5493	

7.0 Water Detail**7.1 Mitigation Measures Water**

Install Low Flow Bathroom Faucet

Install Low Flow Kitchen Faucet

Install Low Flow Toilet

Install Low Flow Shower

Use Water Efficient Irrigation System

Use Water Efficient Landscaping

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	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	284.8869	0.0568	0.0325	296.0043
Unmitigated	337.1608	0.0704	0.0406	351.0099

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7.2 Water by Land Use**Unmitigated**

	Indoor/Out door Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Apartments Low Rise	15.0506 / 9.48841	99.8289	0.0211	0.0122	103.9750
City Park	0 / 1.19148	3.9542	1.1000e- 004	2.0000e- 005	3.9641
Condo/Townhous e	29.4496 / 18.5661	195.3362	0.0412	0.0238	203.4490
Convenience Market (24 Hour)	0.0740725 / 0.0453993	0.4870	1.0000e- 004	6.0000e- 005	0.5074
Recreational Swimming Pool	0.0591431 / 0.036249	0.3889	8.0000e- 005	5.0000e- 005	0.4051
Single Family Housing	5.60325 / 3.53248	37.1657	7.8400e- 003	4.5200e- 003	38.7093
Total		337.1608	0.0704	0.0406	351.0099

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7.2 Water by Land Use**Mitigated**

	Indoor/Out door Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Apartments Low Rise	12.0405 / 8.90962	84.2401	0.0170	9.7400e- 003	87.5680
City Park	0 / 1.1188	3.7130	1.1000e- 004	2.0000e- 005	3.7223
Condo/Townhou se	23.5597 / 17.4335	164.8334	0.0332	0.0191	171.3452
Convenience Market (24 Hour)	0.059258 / 0.0426299	0.4106	8.0000e- 005	5.0000e- 005	0.4269
Recreational Swimming Pool	0.0473145 / 0.0340378	0.3278	7.0000e- 005	4.0000e- 005	0.3409
Single Family Housing	4.4826 / 3.317	31.3621	6.3200e- 003	3.6300e- 003	32.6011
Total		284.8869	0.0568	0.0325	296.0043

8.0 Waste Detail**8.1 Mitigation Measures Waste**

Institute Recycling and Composting Services

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Category/Year

	Total CO2	CH4	N2O	CO2e
MT/yr				
Mitigated	68.2342	4.0325	0.0000	169.0473
Unmitigated	85.2927	5.0407	0.0000	211.3092

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8.2 Waste by Land Use**Unmitigated**

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Apartments Low Rise	106.26	21.5698	1.2747	0.0000	53.4383
City Park	0.09	0.0183	1.0800e-003	0.0000	0.0453
Condo/Townhouse	207.92	42.2059	2.4943	0.0000	104.5633
Convenience Market (24 Hour)	3.01	0.6110	0.0361	0.0000	1.5137
Recreational Swimming Pool	5.7	1.1571	0.0684	0.0000	2.8665
Single Family Housing	97.2	19.7307	1.1661	0.0000	48.8820
Total		85.2927	5.0407	0.0000	211.3092

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8.2 Waste by Land Use**Mitigated**

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Apartments Low Rise	85.008	17.2559	1.0198	0.0000	42.7507
City Park	0.072	0.0146	8.6000e-004	0.0000	0.0362
Condo/Townhouse	166.336	33.7647	1.9954	0.0000	83.6506
Convenience Market (24 Hour)	2.408	0.4888	0.0289	0.0000	1.2110
Recreational Swimming Pool	4.56	0.9256	0.0547	0.0000	2.2932
Single Family Housing	77.76	15.7846	0.9328	0.0000	39.1056
Total		68.2342	4.0325	0.0000	169.0473

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type
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10.0 Stationary Equipment**Fire Pumps and Emergency Generators**

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type
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Boilers

HoKua Place GHG Assessment - Statewide , Annual

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

Equipment Type	Number
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11.0 Vegetation

	Total CO2	CH4	N2O	CO2e
Category	MT			
Unmitigated	-144.5111	0.0000	0.0000	-144.5111

HoKua Place GHG Assessment - Statewide , Annual

11.1 Vegetation Land Change**Vegetation Type**

	Initial/Final	Total CO2	CH4	N2O	CO2e
	Acres	MT			
Grassland	96.06 / 13.25	-356.9111	0.0000	0.0000	-356.9111
Total		-356.9111	0.0000	0.0000	-356.9111

11.2 Net New Trees**Species Class**

	Number of Trees	Total CO2	CH4	N2O	CO2e
		MT			
Miscellaneous	300	212.4000	0.0000	0.0000	212.4000
Total		212.4000	0.0000	0.0000	212.4000