APPENDIX F

CalEEMod Memorandum and Results

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To: **File**

From: **Sally Rideout, EMPA, Principal Planner**

Date: **August 20, 2019**

Re: **965 Weeks Street Apartments – Greenhouse Gas Emissions Modeling Assessment**

Project Description and Setting

The proposed project is the construction and operations of a four-story, 136-unit affordable apartment complex and five level parking garage on a 2.52 acre vacant site located in the City of East Palo Alto, San Mateo County. The project site is undeveloped and has historically been used for agricultural production, most recently for cut flower production. According to the preliminary site plans prepared by David Baker Architects (August 6, 2019), development of the site includes 10-foot wide side yard setbacks and a 20-foot wide rear yard setback; a trail connection linking Weeks Street with the Bay Trail would follow the east side property line.

The application requests include a density bonus request to increase the allowed density on the project site from 40 dwelling units per acre to 54 dwelling units per acre. The proposed apartment buildings would be two to four stories and would provide housing for approximately 442 persons, with affordability levels between 30 percent and 60 percent of area median income.

The proposed project would add approximately 75,000 square feet of impervious surfaces to the site, assuming all building footprint, walkways, and surface parking are impervious. The proposed parking garage would provide 215 parking spaces on five levels with open air parking on the top (roof) level. As shown on the project plans, the garage footprint is approximately 20,000 square feet.

The topography of the project site is relatively flat. Vegetation on the site consists of ruderal grasses and weeds, and two oak trees near the northeast corner. It is anticipated that approximately 34,000 square feet of the 2.52-acre site would be landscaped. Landscape plans have not yet been prepared for the proposed project.

The project site is located within the San Francisco Bay Area Air Basin, which is within the jurisdiction of the Bay Area Air Quality Management District (air district). An initial study is being prepared to evaluate the environmental impacts of the proposed project pursuant to the California Environmental Quality Act (CEQA).

Scope of Assessment

This assessment provides an estimate of the proposed project's criteria air pollutant and greenhouse gas (GHG) emissions using the California Emissions Estimator Model (CalEEMod) Version 2016.3.2 software, a modeling platform recommended by the California Air Resources Board (CARB) and accepted by the air district. Model results are attached to this memorandum. For modeling purposes, data inputs to the model take into account the type and size of proposed uses utilizing CalEEMod default land uses based on the land use types and size metrics identified in the project plans (David Baker Architects 2019) and vehicle trip generation information provided by the project traffic consultant, Hexagon Transportation Consultants.

Emissions Model

The CalEEMod software utilizes emissions models USEPA AP-42 emission factors, CARB vehicle emission models studies and studies commissioned by other California agencies such as the California Energy Commission and CalRecycle. The CalEEMod platform allows calculations of both construction and operational criteria pollutant and GHG emissions from land use projects. The model also calculates indirect emissions from processes "downstream" of the proposed project such as GHG emissions from energy use, solid waste disposal, vegetation planting and/or removal, and water use.

CalEEMod is capable of estimating changes in the carbon sequestration potential of a site based on changes in natural vegetation communities and the net number of new trees that would be planted as part of the project. The model calculates a one-time only loss in the carbon sequestration potential of the site that would result from changes in land use such as converting vegetation, including agricultural cropland to built or paved surfaces, and can provide an

estimate of an increase in carbon sequestration potential that would result from planting new trees greater than the number of trees to be removed (net number of new trees).

The dominant plant community on the project site consists of grassland, all of which would be removed by the proposed project. There are also two oak trees on the project site, which are assumed to be retained by the project. Landscaping plans were not available at the time of this analysis; however, the preliminary plans indicate that tree plantings will be made in open space areas on the site and in the side and rear setbacks. The proposed project would also be required to install street tree plantings along the project frontage. Assuming a total linear distance of about 1,500 feet across the site frontage and within rear and side setbacks, approximately 100 new trees could be planted in these areas at a spacing of 15 feet on center. Additional tree plantings are proposed in the interior areas of the site, but details are not yet available sufficient to estimate the number of new tree plantings on the interior of the site. The overall number of new tree plantings could be greater than assumed in this assessment.

This assessment includes quantification of a one-time loss of carbon sequestration potential resulting from conversion of on-site grassland to urban development, and includes an estimate of an increase in carbon sequestration potential on the site that would result from planting 100 new trees.

Proposed Emissions Sources

The size and type of proposed sources of criteria air pollutant and GHG emissions on the project site and their respective CalEEMod land use default categories are presented in Table 1, Project Characteristics.

Table 1 Project Characteristics

Project Components	CalEEMod Default Land Use Category[1]	Size
Low-rise apartments	Apartments – Mid Rise	136 dwelling units
Parking Garage	Enclosed Parking Structure With Elevator	215 spaces
Impervious Surfaces	Other non-Asphalt Surfaces	29,839 square feet

SOURCES: Trinity Consultants 2017, David Baker Architects 2019, EMC Planning Group 2019.
NOTE:
1. Descriptions of the model default land use categories and subtypes are found in the User's Guide for CalEEMod Version 2016.3.2 available online at: http://www.aqmd.gov/caleemod/user's-guide

Methodology

Unmitigated greenhouse gas (GHG) emissions that would be generated by the proposed project are estimated based upon the project information provided by the applicant and their architect, and the traffic consultant. Unless otherwise noted, the calculated emissions estimates are based primarily on model default emissions factors for construction and operations of the project.

The proposed project is below the air district screening size for quantification of criteria air pollutant emissions (Bay Area Air Quality Management District May 2017). Therefore, this assessment does not include calculations of construction or operational criteria air pollutant emissions.

The unmitigated GHG emissions calculated here include standard conditions of approval and/or compliance with applicable local and State requirements for water and energy conservation. Emissions reductions that would occur through compliance with standard regulatory measures are shown as "mitigated" results in the model output (attached). The mitigation emissions output reflects estimated reductions in emissions volumes that would occur through project compliance with State and local requirements. These requirements are explained in greater detail under the Operational Data Inputs discussion.

Assumptions

Unless otherwise noted, data inputs for the model scenarios are based on the following primary assumptions:

1. According to the applicant, the operational date for full buildout and occupancy of the project site is 2022;

2. Emissions generated by the proposed apartment complex are assumed to be similar to emissions that would be generated by the construction and operations of the CalEEMod default land use subtype "Apartments Mid Rise", which are defined as apartment complexes with four to ten floors;
3. Construction emissions generated by the construction of the parking garage is assumed to be similar to the CalEEMod default land use subtype "Enclosed Parking Structure with Elevator", which is defined as an above or below-ground structure that will require lighting and ventilation, and will be more than one floor with an elevator;
4. Construction emissions from installing a new driveways/street infrastructure are assumed to be similar to emissions that would be generated by the construction of the CalEEMod default land use subtype "Other Non-Asphalt Surfaces," which are impervious surfaces not covered with asphalt; and
5. Construction activity is assumed to yield a balanced cut and fill with no soil/material import or export.

Modeling Scenario

Unmitigated operational GHG emissions estimates are modeled for proposed project conditions. Unmitigated operational GHG emissions generated by the proposed project were modeled including adjustments ("mitigation") for compliance with local and state regulations that are intended to result, or coincidentally result in a co-benefit of emissions reductions.

Operational Emissions Data Inputs

Each air district (or county) assigns trip lengths for urban and rural settings, which are incorporated into the CalEEMod defaults. Based on the project's location within the city, the model's defaults were set to "urban".

The model's default CO_2 intensity factor of 641 pounds/megawatt hour is adjusted to 290 pounds/megawatt hour to reflect Pacific Gas & Electric energy intensity projections for 2020, which is the horizon year for the provider's energy intensity factor projections. The intensity factor has been falling, in significant part due to the increasing percentage of Pacific Gas & Electric's energy portfolio obtained from renewable energy. Emissions intensity data is from Pacific Gas & Electric's *Greenhouse Gas Factors: Guidance for PG&E Customers*, dated November 2015.

Mobile sources of emissions are captured by using the trip generation estimates provided by Hexagon Transportation Consultants (Ling Jin, email message, August 16, 2019).

The model was adjusted to account for mandatory compliance with State requirements for Model Water Efficient Landscape Ordinance (MWELO), compliance with 2019 Title 24 building energy efficiency standards, and installation of low-flow water fixtures and Energy Star® appliances to meet minimum standards for the GreenPoint Rated program. Common measures in the GreenPoint Rated program include the installation of high-efficacy lighting, Energy Star® appliances, water efficient fixtures, solar electric panels, solar water heaters, and low or zero emitting interior paints, varnishes, cabinetry and carpeting (Build it Green 2019).

The Title 24 building energy efficiency defaults in CalEEMod Version 2016.3.2 are the 2016 Title 24 standards. Title 24 standards are updated every three years. The 2019 Title 24 standards were recently adopted and become effective on January 1, 2020 (California Energy Commission 2018). Projects that buildout after January 1, 2020 will be required to comply with the 2019 Title 24 standards. An adjustment of 30 percent was made to the energy mitigation screen under the proposed project scenario to account for an increase in commercial building energy efficiencies above the 2016 Title 24 standards that are anticipated by California Energy Commission through compliance with 2019 Title 24 standards.

Operational mobile-source mitigating factors were tripped in the model to accommodate for an increase in residential density, the integration of below market rate housing, and the provision of a public trail connection across the site between Weeks Street and the Bay Trail. Although the project plans identify the use of rooftop solar panels, information has not yet been provided in detail sufficient to identify the amount of energy demand that would be provided by this alternative source of energy. The use of solar panels is not included in this assessment.

Construction Emissions Data Inputs

The CalEEMod program models construction GHG emissions associated with land use development projects and allows for the input of project-specific construction information including phasing and equipment information, if known. CalEEMod default construction parameters allow estimates of short term construction GHG emissions based upon empirical data collected and analyzed by the California Air Resources Board.

Use of the model's default construction emissions data for a proposed project is recommended by the local air district if construction information is not yet available. The air district also recommends amortizing the short term GHG construction emissions over a 30-year time period to yield an annual emissions volume. Information regarding type of construction equipment by phase for the proposed project was not yet available in detail sufficient to provide data inputs to the model; therefore, consistent with air district guidance, the model defaults were utilized for construction equipment, based on the project size and land use data presented in Table 1. Since the proposed project is development of a vacant site, construction factors for demolition were deleted from the model. The modeling results for unmitigated construction emissions volumes are attached to this memorandum.

Carbon Sequestration Potential Data Inputs

CalEEMod also estimates a one-time only change in sequestration potential resulting from changes in natural plant communities, and also calculates a carbon "offset" based upon the number of net new trees proposed, averaged over a 20-year growth cycle. The proposed project would remove approximately 2.52 acres of grassland. Therefore, an estimate of the one-time loss in carbon sequestration value attributable to the loss of grassland is included in this assessment. Although a landscape plan identifying proposed tree plantings is not yet available, the project plans provide enough detail to assume that at least 100 new trees would be planted as part of the project. Therefore, an estimate of the carbon sequestration potential of 100 trees is included in this assessment.

Results

Construction and operational GHG emissions model results are reported on an annual basis in metric tons of carbon dioxide equivalent (MT CO_2e). Detailed model results for annual GHG emissions are included as attachments to this assessment.

GHG Emissions

Construction GHG Emissions

Construction activity would generate an estimated 450.42 MT CO_2e of unmitigated GHG emissions. When averaged over a thirty-year operational lifetime, the annual amortized emissions equal 15.01 MT CO_2e per year.

Operational GHG Emissions

The model results for unmitigated GHG emissions generated by the proposed project are attached to this assessment. The model results indicate that proposed project would generate annual unmitigated operational GHG emissions of 963.39 MT CO_2e, without compliance with regulatory measures. Project-related emissions from activity that includes required regulatory compliance as noted previously, would generate GHG emissions of 701.34 MT CO_2e, and are summarized in Table 2, Annual Operational GHG Emissions

Table 2 Annual Operational GHG Emissions[1,2]

Emissions Sources	Bio CO_2	NBio CO_2	CH_4	N_2O	CO_2e
Area	0.00	1.65	0.01	<0.01	1.69
Energy[3]	0.00	170.57	0.02	<0.01	171.91
Mobile[4]	0.00	478.61	0.03	0.00	479.10
Waste	12.70	0.00	0.75	0.00	31.46
Water[5]	2.25	7.46	0.29	<0.01	17.17
Total	**14.95**	**658.30**	**1.02**	**0.01**	**701.34**

SOURCE: EMC Planning Group 2019
NOTES:
1. Results may vary due to rounding.
2. Expressed in MT CO_2e per year.
3. Results include emissions reduction from compliance with 2019 Title 24 building energy efficiency standards and use of EnergyStar Appliances per the Green Point Rating Program.
4. Results include emissions reduction due to the following project characteristics: increase in residential density, the integration of below market rate housing, and the provision of a public trail connection across the site between Weeks Street and the Bay Trail
5. Results include emissions reductions from compliance with State thresholds for MWELO and requirements of the Green Point Rating Program.

Carbon Sequestration Potential

Model results indicating the change in carbon sequestration potential on the project site are shown in Section 2.3 of the model results for annual emissions. The model estimates the one time only loss in sequestration potential as 10.86 MT CO_2e, and the gain in sequestration potential from planting 100 new trees as 70.80 MT CO_2e. The proposed project would result in a net gain in sequestration potential on the order of 59.94 MT CO_2e. Averaged over a thirty-year lifetime, the annual gain in sequestration potential associated with the proposed project is equivalent to 2.00 MT CO_2e per year. The average net gain in sequestration potential is subtracted from the project's annual operational GHG emissions.

GHG Emissions Attributable to the Proposed Project, Regulatory Emissions Reduction Scenario

The estimated total GHG emissions that would be attributable to the proposed project consist of the sum of amortized construction emissions and the operational emissions, less the amortized annual gain in carbon sequestration potential on the site. The net mitigated GHG emissions attributable to the proposed project are presented in Table 3, Summary of GHG Emissions Attributable to the Project with Regulatory Emissions Reduction.

Table 3 Summary of GHG Emissions Attributable to the Project[1,2]

Annual Operational Emissions[3]	Amortized Construction Emissions	Annual Project Emissions[4]	Carbon Sequestration Potential	Net Project Unmitigated Emissions
701.34	15.01	716.35	<2.00>	714.35

SOURCE: EMC Planning Group 2019
NOTES:
1. Results may vary due to rounding.
2. Expressed in MT CO_2e per year.
3. Mitigated Annual MT CO_2e (See Table 3).
4. Sum of amortized construction and mitigated operational emissions.
5. <Brackets> indicate deductions.

Sources

1. Trinity Consultants. California Emissions Estimator (CalEEMod) Version 2016.3.2. November 2017. Available online at: http://www.aqmd.gov/caleemod/home
2. Trinity Consultants. CalEEMod User's Guide (Version 2016.3.2). November 2017. Available online at: http://www.aqmd.gov/caleemod/user's-guide
3. Bay Area Air Quality Management District. California Environmental Quality Act Air Quality Guidelines. May 2017. http://www.baaqmd.gov/~/media/files/planning-and-research/ceqa/ceqa_guidelines_may2017-pdf.pdf?la=en
4. David Baker Architects. August 6, 2019. 965 Weeks Street CEQA Reference Drawings. San Francisco, CA.
5. Jin, Ling, Hexagon Transportation Consultants. Email message to consultant, August 16 2019.

6. Pacific Gas & Electric. November 2015. *Greenhouse Gas Factors: Guidance for PG&E Customers*; Accessed August 13, 2019. https://www.pge.com/includes/docs/pdfs/shared/environment/calculator/pge_ghg_emission_factor_info_sheet.pdf

7. California Energy Commission. July 22, 2019. *2019 Building Energy Efficiency Standards Frequently Asked Questions.* https://www.energy.ca.gov/title24/2019standards/documents/2018_Title_24_2019_Building_Standards_FAQ.pdf

8. Build It Green Webpage. 2019. Accessed August 19, 2019. https://builditgreen.org/greenpoint-rated/how-it-works/greenpoint-rated-new-home

965 Weeks Apartments - Bay Area AQMD Air District, Annual

965 Weeks Apartments

Bay Area AQMD Air District, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Enclosed Parking with Elevator	76.95	1000sqft	0.46	76,950.00	0
Other Non-Asphalt Surfaces	29.84	1000sqft	0.69	29,839.00	0
Apartments Mid Rise	136.00	Dwelling Unit	1.40	126,000.00	389

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	64
Climate Zone	5			**Operational Year**	2022
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	290	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics - Adjusted CO2 intensity factor

Land Use - garage 20,000 sf footprint. Apartment sf and population from Mid-Peninsula Housing project description. Acreages estimated from plans.

Construction Phase - Adjusted - no demo

Vehicle Trips - TIA Trip generation

Energy Use -

Land Use Change -

Sequestration -

Construction Off-road Equipment Mitigation - BAAQMD BMPs for dust control

Mobile Land Use Mitigation -

Mobile Commute Mitigation -

Area Mitigation - Use low VOC paints interior and exterior

Energy Mitigation - Anticipated savings of compliance with 2019 Title 24 building efficiency standards for mid-rise multifamily, and use of EnergyStar Appliances

Water Mitigation - Installation of low flow fixtures and compliance with State MWELO

Table Name	Column Name	Default Value	New Value
tblAreaMitigation	UseLowVOCPaintParkingCheck	False	True
tblLandUse	LandUseSquareFeet	29,840.00	29,839.00
tblLandUse	LandUseSquareFeet	136,000.00	126,000.00
tblLandUse	LotAcreage	1.77	0.46
tblLandUse	LotAcreage	3.58	1.40
tblProjectCharacteristics	CO2IntensityFactor	641.35	290
tblSequestration	NumberOfNewTrees	0.00	100.00
tblVehicleTrips	WD_TR	6.65	5.44

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2020	0.6051	2.5159	2.2396	5.1200e-003	0.1707	0.1147	0.2854	0.0504	0.1097	0.1601	0.0000	447.3743	447.3743	0.0591	0.0000	448.8509
2021	0.6375	5.5600e-003	8.6400e-003	2.0000e-005	8.0000e-004	3.3000e-004	1.1400e-003	2.1000e-004	3.3000e-004	5.5000e-004	0.0000	1.5717	1.5717	8.0000e-005	0.0000	1.5736
Maximum	**0.6375**	**2.5159**	**2.2396**	**5.1200e-003**	**0.1707**	**0.1147**	**0.2854**	**0.0504**	**0.1097**	**0.1601**	**0.0000**	**447.3743**	**447.3743**	**0.0591**	**0.0000**	**448.8509**

Total 450.42

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.6205	0.0117	1.0119	5.0000e-005		5.5900e-003	5.5900e-003		5.5900e-003	5.5900e-003	0.0000	1.6514	1.6514	1.6000e-003	0.0000	1.6913
Energy	5.0600e-003	0.0432	0.0184	2.8000e-004		3.4900e-003	3.4900e-003		3.4900e-003	3.4900e-003	0.0000	170.5715	170.5715	0.0130	3.4100e-003	171.9133
Mobile	0.1671	0.7672	1.6046	5.2100e-003	0.4339	4.8400e-003	0.4387	0.1165	4.5300e-003	0.1210	0.0000	478.6129	478.6129	0.0197	0.0000	479.1046
Waste						0.0000	0.0000		0.0000	0.0000	12.6991	0.0000	12.6991	0.7505	0.0000	31.4615
Water						0.0000	0.0000		0.0000	0.0000	2.2489	7.4606	9.7095	0.2317	5.6100e-003	17.1742
Total	**0.7927**	**0.8221**	**2.6349**	**5.5400e-003**	**0.4339**	**0.0139**	**0.4478**	**0.1165**	**0.0136**	**0.1301**	**14.9481**	**658.2965**	**673.2445**	**1.0165**	**9.0200e-003**	**701.3450**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**29.91**	**18.57**	**26.84**	**37.61**	**34.14**	**82.31**	**39.29**	**34.14**	**82.61**	**49.01**	**31.15**	**27.74**	**27.82**	**6.93**	**20.60**	**27.20**

2.3 Vegetation

Vegetation

	CO2e
Category	MT
New Trees	70.8000
Vegetation Land Change	-10.8612
Total	**59.9388**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

Increase Density

Integrate Below Market Rate Housing

Improve Pedestrian Network

	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	0.1671	0.7672	1.6046	5.2100e-003	0.4339	4.8400e-003	0.4387	0.1165	4.5300e-003	0.1210	0.0000	478.6129	478.6129	0.0197	0.0000	479.1046
Unmitigated	0.1902	0.9359	2.1344	7.6200e-003	0.6588	6.9100e-003	0.6657	0.1768	6.4700e-003	0.1833	0.0000	699.7070	699.7070	0.0258	0.0000	700.3527

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Apartments Mid Rise	739.84	869.04	796.96	1,770,215	1,165,793
Enclosed Parking with Elevator	0.00	0.00	0.00		
Other Non-Asphalt Surfaces	0.00	0.00	0.00		
Total	739.84	869.04	796.96	1,770,215	1,165,793

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Apartments Mid Rise	10.80	4.80	5.70	31.00	15.00	54.00	86	11	3
Enclosed Parking with Elevator	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0
Other Non-Asphalt Surfaces	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Apartments Mid Rise	0.576985	0.039376	0.193723	0.112069	0.016317	0.005358	0.017943	0.025814	0.002614	0.002274	0.005874	0.000887	0.000768
Enclosed Parking with Elevator	0.576985	0.039376	0.193723	0.112069	0.016317	0.005358	0.017943	0.025814	0.002614	0.002274	0.005874	0.000887	0.000768
Other Non-Asphalt Surfaces	0.576985	0.039376	0.193723	0.112069	0.016317	0.005358	0.017943	0.025814	0.002614	0.002274	0.005874	0.000887	0.000768

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

Exceed Title 24

Install Energy Efficient Appliances

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	120.5254	120.5254	0.0121	2.4900e-003	121.5698
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	134.8458	134.8458	0.0135	2.7900e-003	136.0143
NaturalGas Mitigated	5.0600e-003	0.0432	0.0184	2.8000e-004		3.4900e-003	3.4900e-003		3.4900e-003	3.4900e-003	0.0000	50.0461	50.0461	9.6000e-004	9.2000e-004	50.3435
NaturalGas Unmitigated	6.4000e-003	0.0547	0.0233	3.5000e-004		4.4200e-003	4.4200e-003		4.4200e-003	4.4200e-003	0.0000	63.3609	63.3609	1.2100e-003	1.1600e-003	63.7374

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Apartments Mid Rise	937829	5.0600e-003	0.0432	0.0184	2.8000e-004		3.4900e-003	3.4900e-003		3.4900e-003	3.4900e-003	0.0000	50.0461	50.0461	9.6000e-004	9.2000e-004	50.3435
Enclosed Parking with Elevator	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**5.0600e-003**	**0.0432**	**0.0184**	**2.8000e-004**		**3.4900e-003**	**3.4900e-003**		**3.4900e-003**	**3.4900e-003**	**0.0000**	**50.0461**	**50.0461**	**9.6000e-004**	**9.2000e-004**	**50.3435**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			

Apartments Mid Rise	555818	73.1133	7.3100e-003	1.5100e-003	73.7469
Enclosed Parking with Elevator	360434	47.4121	4.7400e-003	9.8000e-004	47.8230
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		**120.5254**	**0.0121**	**2.4900e-003**	**121.5698**

6.0 Area Detail

6.1 Mitigation Measures Area

Use Low VOC Paint - Residential Interior

Use Low VOC Paint - Residential Exterior

Use Low VOC Paint - Non-Residential Interior

Use Low VOC Paint - Non-Residential Exterior

No Hearths Installed

	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	0.6205	0.0117	1.0119	5.0000e-005		5.5900e-003	5.5900e-003		5.5900e-003	5.5900e-003	0.0000	1.6514	1.6514	1.6000e-003	0.0000	1.6913
Unmitigated	0.9343	0.0189	1.4440	9.1000e-004		0.0674	0.0674		0.0674	0.0674	6.2002	4.1982	10.3984	0.0116	4.1000e-004	10.8085

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0909					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.4990					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	0.0306	0.0117	1.0119	5.0000e-005		5.5900e-003	5.5900e-003		5.5900e-003	5.5900e-003	0.0000	1.6514	1.6514	1.6000e-003	0.0000	1.6913
Total	**0.6205**	**0.0117**	**1.0119**	**5.0000e-005**		**5.5900e-003**	**5.5900e-003**		**5.5900e-003**	**5.5900e-003**	**0.0000**	**1.6514**	**1.6514**	**1.6000e-003**	**0.0000**	**1.6913**

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

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	9.7095	0.2317	5.6100e-003	17.1742
Unmitigated	11.6900	0.2896	7.0000e-003	21.0170

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Apartments Mid Rise	7.08876 / 5.24549	9.7095	0.2317	5.6100e-003	17.1742
Enclosed Parking with Elevator	0 / 0	0.0000	0.0000	0.0000	0.0000
Other Non-Asphalt Surfaces	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**9.7095**	**0.2317**	**5.6100e-003**	**17.1742**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	12.6991	0.7505	0.0000	31.4615
Unmitigated	12.6991	0.7505	0.0000	31.4615

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Apartments Mid Rise	62.56	12.6991	0.7505	0.0000	31.4615
Enclosed Parking with Elevator	0	0.0000	0.0000	0.0000	0.0000
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		**12.6991**	**0.7505**	**0.0000**	**31.4615**

11.0 Vegetation

	Total CO2	CH4	N2O	CO2e
Category	MT			
Unmitigated	59.9388	0.0000	0.0000	59.9388

11.1 Vegetation Land Change

Vegetation Type

	Initial/Final	Total CO2	CH4	N2O	CO2e
	Acres	MT			

Grassland	2.52 / 0	-10.8612	0.0000	0.0000	-10.8612
Total		**-10.8612**	**0.0000**	**0.0000**	**-10.8612**

11.2 Net New Trees

Species Class

	Number of Trees	Total CO2	CH4	N2O	CO2e
		MT			
Miscellaneous	100	70.8000	0.0000	0.0000	70.8000
Total		**70.8000**	**0.0000**	**0.0000**	**70.8000**