APPENDIX C-25
OTAY RANCH RESORT VILLAGE
GHG EMISSIONS – ALTERNATIVE B MEMORANDUM

JANUARY 2019

PREPARED FOR:
COUNTY OF SAN DIEGO
PLANNING & DEVELOPMENT SERVICES
5510 OVERLAND AVENUE
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Memorandum

To:	County of San Diego	From:	Valorie Thompson
Re:	Otay Ranch Resort Village GHG Emissions - Alternative B	Date:	January 3, 2019

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Introduction

This technical memorandum addresses the greenhouse gas (GHG) emissions associated with Alternative B for the Otay Ranch Resort Village. As provided in the Environmental Impact Report (EIR), Alternative B would develop the Project site as described in the existing Otay Ranch Subregional Plan (SRP); the land uses therein, which are reflected in the current General Plan, include the following:

- 530 single-family dwelling units
- 1,408 multi-family dwelling units
- 800-room resort hotel
- 141.5-acre golf course
- School
- Public safety building
- 40,000 square feet of commercial/retail uses

The purpose of this analysis is to evaluate the GHG emissions from Alternative B and to provide a comparison with the Proposed Project's GHG emissions.

GHG Emissions Analysis

To provide an analysis for Alternative B that is consistent with the analysis conducted for the Proposed Project, the same approach was used to quantify GHG emissions. To briefly summarize, the following methodology and assumptions were used:

- CalEEMod Version 2016.3.2 was used to calculate GHG emissions from solid waste generation, water use, and area sources.
- GHG emissions from energy use for single-family residential units were calculated using the analysis conducted by ConSol[1].
- GHG emissions from energy use for other land uses (e.g., multi-family residential units and non-residential buildings) were calculated assuming the uses would meet Title 24 as of 2016, based on information from the California Energy Commission[2].
- Energy obtained from SDG&E would meet the state's requirement under the Renewable Portfolio Standard to provide 60% of its energy from renewable sources by 2030.
- Emissions from vehicles were calculated using emission factors from the EMFAC2014 model as contained within the CalEEMod model. Vehicle miles traveled were calculated assuming trip lengths for all uses would be consistent with the vehicle miles traveled calculated by Chen Ryan[3]. The total vehicle miles traveled is proportionate to the average daily trips. According to the project description, Alternative B would result in approximately 3,266 additional ADT in comparison to the Proposed Project.
- Emissions from solid waste were adjusted, as for the Proposed Project, to meet the County's goal of 75% diversion by 2030.
- Residential units would be equipped with natural gas fireplaces (but not wood-burning fireplaces), and would operate (on average) 30 days per year.

No additional mitigation measures were assumed in this analysis, as none were proposed in or required by the Otay SRP/General Plan.

For the purpose of this analysis, it was assumed that the construction emissions and the carbon sequestration loss would be the same as for the Proposed Project. No additional analysis is therefore presented in this technical memorandum.

Table 1 presents a summary of the operational GHG emission estimates for Alternative B.

[1] ConSol. 2017. *Village 13 Building Analysis.*
[2] California Energy Commission. 2015. *2016 Building Energy Efficiency Standards, Adoption Hearing*. June 10.
[3] Chen Ryan. 2019. *Transportation Demand Management Program Evaluation & SB 743 Compliance – Otay Ranch Resort Village*.

Table 1 SUMMARY OF ALTERNATIVE B ESTIMATED OPERATIONAL GREENHOUSE GAS EMISSIONS – 2030				
Emission Source	**Annual Emissions (Metric tons/year)**			
	CO_2	**CH_4**	**N_2O**	**CO_2e**
Area Sources	582	0.0329	0.0102	586
Energy Use	10,265	0.2921	0.1428	10,315
Water Consumption	774	4.0180	0.1003	904
Solid Waste Handling	280	16.5612	0.0000	694
Vehicles	27,178	1.3301	0.0000	27,211
Operational Sub-total	**39,079**	**22.2343**	**0.2533**	**39,709**
Global Warming Potential Factor	**1**	**25**	**298**	
Operational Total	**39,079**	**556**	**75**	**39,709**

Comparison with Proposed Project

The GHG emissions from the Proposed Project are lower than the GHG emissions from Alternative B, as shown in Table 2.

Table 2 SUMMARY OF PROPOSED PROJECT AND COMPARISON WITH ALTERNATIVE B ESTIMATED OPERATIONAL GREENHOUSE GAS EMISSIONS – 2030				
Emission Source	**Annual Emissions (Metric tons/year)**			
	CO_2	**CH_4**	**N_2O**	**CO_2e**
Area Sources	582	0.0328	0.0102	586
Energy Use	7,792	0.2135	0.1125	7,831
Water Consumption	426	3.6065	0.0881	543
Solid Waste Handling	238	14.0682	0.0000	590
Vehicles	24,212	1.1876	0.0000	24,241
Operational Sub-total	**33,250**	**19,1089**	**0.2108**	**33,791**
Global Warming Potential Factor	**1**	**25**	**298**	
Operational Total, Proposed Project	**33,250**	**478**	**63**	**33,791**
Operational Total, Alternative B	**39,079**	**556**	**75**	**39,709**
Net Decrease	**(5,829)**	**(78)**	**(12)**	**(5,918)**

Conclusion

As shown in Table 2, the operational GHG emissions from the Proposed Project are lower than the GHG emissions from Alternative B by approximately 5,918 metric tons of CO_2e, which equates to a 15 percent reduction.

Valorie L. Thompson, Ph.D.

Attachment A

GHG Emission Calculations
Alternative B

Table A-1
GHG Emissions from Energy Use
Alternative B

Land Use	CO2	CH4	N2O	CO2e
GHG Emissions from Electricity Use[1]				
Condo/Townhouse	1160.36	0.0467	0.0097	1164.40
Elementary School	43.12	0.0017	0.0004	43.27
Government Office Building	22.05	0.0009	0.0002	22.13
Hotel	2467.91	0.1024	0.0205	2476.58
Retail	82.42	0.0033	0.0007	82.71
TOTAL Electricity	**3775.86**	**0.1551**	**0.0314**	**3789.09**
GHG Emissions from Natural Gas[1]				
Condo/Townhouse	1080.67	0.0207	0.0198	1087.09
Elementary School	15.85	0.0003	0.0003	15.94
Government Office Building	10.77	0.0002	0.0002	10.84
Hotel	3618.20	0.0694	0.0663	3639.70
Retail	4.76	0.0001	0.0001	4.79
TOTAL Natural Gas	**4730.26**	**0.0907**	**0.0867**	**4758.36**
GHG Emissions from Electricity and Natural Gas for Single-Family Homes[2]				
Single-Family Housing	1758.78	0.0464	0.0247	1766.63
TOTAL GHG EMISSIONS	**10264.90**	**0.2921**	**0.1428**	**10314.08**

GHG Emissions from Vehicles

This Appendix presents the methodology utilized to calculate GHG emission factors for and GHG emissions from vehicles.

Emission Factors Calculation

The GHG emission factors were calculated based on the emission factors from EMFAC2014 within the CalEEMod Model. For the purpose of this analysis, an emission factor for the fleet was calculated based on the CalEEMod Model factors as described below:

The CalEEMod Model's unmitigated defaults indicate that the total VMT for the Project is 67,656,320 miles per year. Based on the EMFAC2014 emission factors utilized by the CalEEMod Model, the Project's total annual CO_2 emissions were 21,401.9282 MT/year, and total annual CH_4 emissions were 1.0467 MT/year. To obtain GHG emission factors for the San Diego County fleet, these emissions were divided by the total VMT derived from the unmitigated defaults as shown below:

CO_2 emission factor, tons/VMT: 21,401.9282 MT/yr / 67,656,320 miles/yr
$= 3.16 \times 10^{-4}$ MT/VMT

CH_4 emission factors, tons/VMT: 1.0467 MT/yr / 67,656,320 miles/yr
$= 1.55 \times 10^{-8}$ MT/VMT

Total Project VMT and Related GHG Emissions

Based on a comparison of CalEEMod trip generation rates with the project as documented in the Chen Ryan analysis, Alternative B's estimated VMT is 237,549 miles/day for weekday miles. Based on the CalEEMod Model, weekend miles are 3.6% lower than weekday miles. Therefore, the Project's total VMT was calculated as follows:

Weekday miles: 237,549 VMT x 261 days/year
= 62,000,195 miles/year

Weekend miles: (1-.036) x 237,549 VMT x 104 days/year
= 23,815,676 miles/year

Total annual VMT: 85,815,871

Alternative B's unmitigated traffic-related GHG emissions, therefore, are calculated as follows:

85,815,871 miles/yr x 3.16×10^{-4} MT CO_2/VMT = 27,178 MT CO_2/yr

85,815,871 miles/yr x 1.55×10^{-8} MT CH_4/VMT = 1.3301 MT CH_4/yr

Otay Ranch Alternative B - San Diego Air Basin, Annual

Otay Ranch Alternative B

San Diego Air Basin, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Government Office Building	10.00	1000sqft	0.23	10,000.00	0
Elementary School	600.00	Student	10.00	50,162.02	0
City Park	16.40	Acre	16.40	714,384.00	0
Golf Course	141.50	Acre	141.50	6,163,740.00	0
Hotel	800.00	Room	26.67	1,161,600.00	0
Condo/Townhouse	1,408.00	Dwelling Unit	88.00	1,408,000.00	4027
Single Family Housing	530.00	Dwelling Unit	172.08	954,000.00	1516
Strip Mall	40.00	1000sqft	1.00	40,000.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.6	**Precipitation Freq (Days)**	40
Climate Zone	13			**Operational Year**	2030
Utility Company	San Diego Gas & Electric				
CO2 Intensity (lb/MWhr)	361.68598	**CH4 Intensity (lb/MWhr)**	0.014558	**N2O Intensity (lb/MWhr)**	0.003012

1.3 User Entered Comments & Non-Default Data

Fleet Mix -

Area Coating - Rule 67.0.1 coatings

Table Name	Column Name	Default Value	New Value
tblAreaCoating	Area_EF_Nonresidential_Exterior	250	100
tblAreaCoating	Area_EF_Nonresidential_Interior	250	50
tblAreaCoating	Area_EF_Residential_Exterior	250	100
tblAreaCoating	Area_EF_Residential_Interior	250	50
tblAreaMitigation	UseLowVOCPaintNonresidentialExterior Value	100	250
tblAreaMitigation	UseLowVOCPaintNonresidentialInterior Value	50	250
tblAreaMitigation	UseLowVOCPaintResidentialExteriorValue	100	250
tblAreaMitigation	UseLowVOCPaintResidentialInteriorValue	50	250
tblFireplaces	FireplaceDayYear	82.00	30.00
tblFireplaces	FireplaceDayYear	82.00	30.00
tblFireplaces	NumberGas	774.40	1,408.00
tblFireplaces	NumberGas	291.50	530.00
tblFireplaces	NumberNoFireplace	140.80	0.00
tblFireplaces	NumberNoFireplace	53.00	0.00
tblFireplaces	NumberWood	492.80	0.00
tblFireplaces	NumberWood	185.50	0.00
tblGrading	AcresOfGrading	1,937.50	0.00
tblGrading	AcresOfGrading	150.00	0.00
tblLandUse	LotAcreage	1.15	10.00
tblLandUse	LotAcreage	0.92	1.00
tblOffRoadEquipment	HorsePower	231.00	226.00
tblOffRoadEquipment	HorsePower	187.00	174.00
tblOffRoadEquipment	HorsePower	130.00	125.00
tblOffRoadEquipment	HorsePower	247.00	255.00
tblOffRoadEquipment	HorsePower	247.00	255.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00

tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	1.00
tblOffRoadEquipment	UsageHours	7.00	4.00
tblOffRoadEquipment	UsageHours	8.00	6.00
tblOffRoadEquipment	UsageHours	8.00	7.00
tblOffRoadEquipment	UsageHours	8.00	7.00
tblOffRoadEquipment	UsageHours	8.00	1.00
tblOffRoadEquipment	UsageHours	8.00	1.00
tblOffRoadEquipment	UsageHours	7.00	8.00
tblOffRoadEquipment	UsageHours	8.00	6.00
tblProjectCharacteristics	CH4IntensityFactor	0.029	0.014558
tblProjectCharacteristics	CO2IntensityFactor	720.49	361.68598
tblProjectCharacteristics	N2OIntensityFactor	0.006	0.003012
tblSequestration	NumberOfNewTrees	0.00	5,176.00
tblTripsAndVMT	WorkerTripNumber	18.00	10.00
tblTripsAndVMT	WorkerTripNumber	23.00	10.00
tblTripsAndVMT	WorkerTripNumber	23.00	18.00
tblTripsAndVMT	WorkerTripNumber	13.00	5.00
tblVehicleTrips	CC_TL	7.30	2.67
tblVehicleTrips	CC_TL	7.30	2.00
tblVehicleTrips	ST_TR	22.75	5.00
tblVehicleTrips	ST_TR	5.67	8.00
tblVehicleTrips	ST_TR	5.82	8.00
tblVehicleTrips	ST_TR	0.00	48.10
tblVehicleTrips	ST_TR	8.19	8.00
tblVehicleTrips	ST_TR	9.91	10.00
tblVehicleTrips	ST_TR	42.04	120.00
tblVehicleTrips	SU_TR	16.74	5.00
tblVehicleTrips	SU_TR	4.84	8.00
tblVehicleTrips	SU_TR	5.88	8.00

tblVehicleTrips	SU_TR	0.00	48.10
tblVehicleTrips	SU_TR	5.95	8.00
tblVehicleTrips	SU_TR	8.62	10.00
tblVehicleTrips	SU_TR	20.43	120.00
tblVehicleTrips	WD_TR	1.89	5.00
tblVehicleTrips	WD_TR	5.81	8.00
tblVehicleTrips	WD_TR	1.29	1.50
tblVehicleTrips	WD_TR	5.04	8.00
tblVehicleTrips	WD_TR	68.93	48.10
tblVehicleTrips	WD_TR	8.17	8.00
tblVehicleTrips	WD_TR	9.52	10.00
tblVehicleTrips	WD_TR	44.32	120.00
tblWaterMitigation	UseWaterEfficientIrrigationSystemPercentReduction	6.1	30
tblWoodstoves	NumberCatalytic	70.40	0.00
tblWoodstoves	NumberCatalytic	26.50	0.00
tblWoodstoves	NumberNoncatalytic	70.40	0.00
tblWoodstoves	NumberNoncatalytic	26.50	0.00

2.0 Emissions Summary

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	15.9936	0.6478	14.5717	3.8400e-003		0.1188	0.1188		0.1188	0.1188	0.0000	581.9973	581.9973	0.0332	0.0102	585.8777
Energy	0.5448	4.8568	3.4562	0.0297		0.3764	0.3764		0.3764	0.3764	0.0000	9,871.4803	9,871.4803	0.2837	0.1362	9,919.1455

Mobile	5.3836	23.3445	60.9057	0.2426	26.7438	0.1595	26.9033	7.1587	0.1482	7.3069	0.0000	22,566.6332	22,566.6332	1.1118	0.0000	22,594.4293
Waste						0.0000	0.0000		0.0000	0.0000	406.1930	0.0000	406.1930	24.0053	0.0000	1,006.3261
Water						0.0000	0.0000		0.0000	0.0000	48.5290	831.2258	879.7548	5.0179	0.1246	1,042.3363
Total	**21.9219**	**28.8491**	**78.9337**	**0.2762**	**26.7438**	**0.6548**	**27.3985**	**7.1587**	**0.6434**	**7.8021**	**454.7221**	**33,851.3364**	**34,306.0585**	**30.4518**	**0.2710**	**35,148.1148**

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	15.9875	0.6468	14.4682	3.8300e-003		0.1182	0.1182		0.1182	0.1182	0.0000	581.7851	581.7851	0.0329	0.0102	585.6575
Energy	0.5448	4.8568	3.4562	0.0297		0.3764	0.3764		0.3764	0.3764	0.0000	9,841.0778	9,841.0778	0.2824	0.1359	9,888.6370
Mobile	5.3836	23.3445	60.9057	0.2426	26.7438	0.1595	26.9033	7.1587	0.1482	7.3069	0.0000	22,566.6332	22,566.6332	1.1118	0.0000	22,594.4293
Waste						0.0000	0.0000		0.0000	0.0000	406.1930	0.0000	406.1930	24.0053	0.0000	1,006.3261
Water						0.0000	0.0000		0.0000	0.0000	38.8232	614.5346	653.3578	4.0123	0.0993	783.2471
Total	**21.9159**	**28.8481**	**78.8301**	**0.2762**	**26.7438**	**0.6542**	**27.3979**	**7.1587**	**0.6428**	**7.8015**	**445.0163**	**33,604.0307**	**34,049.0470**	**29.4447**	**0.2454**	**34,858.2969**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.03**	**0.00**	**0.13**	**0.00**	**0.00**	**0.09**	**0.00**	**0.00**	**0.09**	**0.01**	**2.13**	**0.73**	**0.75**	**3.31**	**9.44**	**0.82**

2.3 Vegetation

Vegetation

	CO2e

Category	MT
New Trees	3,799.1840
Vegetation Land Change	-4,047.4167
Total	**-248.2327**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	5.3836	23.3445	60.9057	0.2426	26.7438	0.1595	26.9033	7.1587	0.1482	7.3069	0.0000	22,566.6332	22,566.6332	1.1118	0.0000	22,594.4293
Unmitigated	5.3836	23.3445	60.9057	0.2426	26.7438	0.1595	26.9033	7.1587	0.1482	7.3069	0.0000	22,566.6332	22,566.6332	1.1118	0.0000	22,594.4293

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
City Park	82.00	82.00	82.00	126,634	126,634
Condo/Townhouse	11,264.00	11,264.00	11264.00	32,162,137	32,162,137
Elementary School	900.00	0.00	0.00	1,159,809	1,159,809
Golf Course	1,132.00	1,132.00	1132.00	2,045,841	2,045,841
Government Office Building	481.00	481.00	481.00	824,857	824,857
Hotel	6,400.00	6,400.00	6400.00	12,159,557	12,159,557
Single Family Housing	5,300.00	5,300.00	5300.00	15,133,108	15,133,108

Strip Mall	4,800.00	4,800.00	4800.00	7,392,159	7,392,159
Total	30,359.00	29,459.00	29,459.00	71,004,102	71,004,102

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
City Park	9.50	2.67	7.30	33.00	48.00	19.00	66	28	6
Condo/Townhouse	10.80	7.30	7.50	41.60	18.80	39.60	86	11	3
Elementary School	9.50	2.00	7.30	65.00	30.00	5.00	63	25	12
Golf Course	9.50	7.30	7.30	33.00	48.00	19.00	52	39	9
Government Office Building	9.50	7.30	7.30	33.00	62.00	5.00	50	34	16
Hotel	9.50	7.30	7.30	19.40	61.60	19.00	58	38	4
Single Family Housing	10.80	7.30	7.50	41.60	18.80	39.60	86	11	3
Strip Mall	9.50	7.30	7.30	16.60	64.40	19.00	45	40	15

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
City Park	0.616428	0.037185	0.177402	0.097684	0.012090	0.005279	0.017663	0.025476	0.001931	0.001677	0.005617	0.000785	0.000782
Condo/Townhouse	0.616428	0.037185	0.177402	0.097684	0.012090	0.005279	0.017663	0.025476	0.001931	0.001677	0.005617	0.000785	0.000782
Elementary School	0.616428	0.037185	0.177402	0.097684	0.012090	0.005279	0.017663	0.025476	0.001931	0.001677	0.005617	0.000785	0.000782
Golf Course	0.616428	0.037185	0.177402	0.097684	0.012090	0.005279	0.017663	0.025476	0.001931	0.001677	0.005617	0.000785	0.000782
Government Office Building	0.616428	0.037185	0.177402	0.097684	0.012090	0.005279	0.017663	0.025476	0.001931	0.001677	0.005617	0.000785	0.000782
Hotel	0.616428	0.037185	0.177402	0.097684	0.012090	0.005279	0.017663	0.025476	0.001931	0.001677	0.005617	0.000785	0.000782
Single Family Housing	0.616428	0.037185	0.177402	0.097684	0.012090	0.005279	0.017663	0.025476	0.001931	0.001677	0.005617	0.000785	0.000782
Strip Mall	0.616428	0.037185	0.177402	0.097684	0.012090	0.005279	0.017663	0.025476	0.001931	0.001677	0.005617	0.000785	0.000782

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

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	4,449.3709	4,449.3709	0.1791	0.0371	4,464.8899
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	4,479.7734	4,479.7734	0.1803	0.0373	4,495.3984
NaturalGas Mitigated	0.5448	4.8568	3.4562	0.0297		0.3764	0.3764		0.3764	0.3764	0.0000	5,391.7069	5,391.7069	0.1033	0.0989	5,423.7471
NaturalGas Unmitigated	0.5448	4.8568	3.4562	0.0297		0.3764	0.3764		0.3764	0.3764	0.0000	5,391.7069	5,391.7069	0.1033	0.0989	5,423.7471

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					
City Park	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
Condo/Townhouse	2.02511e+007	0.1092	0.9331	0.3971	5.9600e-003		0.0755	0.0755		0.0755	0.0755	0.0000	1,080.6733	1,080.6733	0.0207	0.0198	1,087.0952
Elementary School	296959	1.6000e-003	0.0146	0.0122	9.0000e-005		1.1100e-003	1.1100e-003		1.1100e-003	1.1100e-003	0.0000	15.8469	15.8469	3.0000e-004	2.9000e-004	15.9410
Golf Course	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
Government Office Building	201900	1.0900e-003	9.9000e-003	8.3100e-003	6.0000e-005		7.5000e-004	7.5000e-004		7.5000e-004	7.5000e-004	0.0000	10.7742	10.7742	2.1000e-004	2.0000e-004	10.8382
Hotel	6.78026e+007	0.3656	3.3237	2.7919	0.0199		0.2526	0.2526		0.2526	0.2526	0.0000	3,618.2045	3,618.2045	0.0694	0.0663	3,639.7057
Single Family Housing	1.23951e+007	0.0668	0.5712	0.2430	3.6500e-003		0.0462	0.0462		0.0462	0.0462	0.0000	661.4480	661.4480	0.0127	0.0121	665.3787
Strip Mall	89200	4.8000e-004	4.3700e-003	3.6700e-003	3.0000e-005		3.3000e-004	3.3000e-004		3.3000e-004	3.3000e-004	0.0000	4.7601	4.7601	9.0000e-005	9.0000e-005	4.7883
Total		**0.5448**	**4.8568**	**3.4562**	**0.0297**		**0.3764**	**0.3764**		**0.3764**	**0.3764**	**0.0000**	**5,391.7069**	**5,391.7069**	**0.1033**	**0.0989**	**5,423.7471**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
City Park	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
Condo/Townhouse	2.02511e+007	0.1092	0.9331	0.3971	5.9600e-003		0.0755	0.0755		0.0755	0.0755	0.0000	1,080.6733	1,080.6733	0.0207	0.0198	1,087.0952
Elementary School	296959	1.6000e-003	0.0146	0.0122	9.0000e-005		1.1100e-003	1.1100e-003		1.1100e-003	1.1100e-003	0.0000	15.8469	15.8469	3.0000e-004	2.9000e-004	15.9410
Golf Course	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
Government Office Building	201900	1.0900e-003	9.9000e-003	8.3100e-003	6.0000e-005		7.5000e-004	7.5000e-004		7.5000e-004	7.5000e-004	0.0000	10.7742	10.7742	2.1000e-004	2.0000e-004	10.8382
Hotel	6.78026e+007	0.3656	3.3237	2.7919	0.0199		0.2526	0.2526		0.2526	0.2526	0.0000	3,618.2045	3,618.2045	0.0694	0.0663	3,639.7057
Single Family Housing	1.23951e+007	0.0668	0.5712	0.2430	3.6500e-003		0.0462	0.0462		0.0462	0.0462	0.0000	661.4480	661.4480	0.0127	0.0121	665.3787
Strip Mall	89200	4.8000e-004	4.3700e-003	3.6700e-003	3.0000e-005		3.3000e-004	3.3000e-004		3.3000e-004	3.3000e-004	0.0000	4.7601	4.7601	9.0000e-005	9.0000e-005	4.7883
Total		**0.5448**	**4.8568**	**3.4562**	**0.0297**		**0.3764**	**0.3764**		**0.3764**	**0.3764**	**0.0000**	**5,391.7069**	**5,391.7069**	**0.1033**	**0.0989**	**5,423.7471**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
City Park	0	0.0000	0.0000	0.0000	0.0000
Condo/Townhouse	7.07285e+006	1,160.3574	0.0467	9.6600e-003	1,164.4046

Elementary School	262849	43.1225	1.7400e-003	3.6000e-004	43.2729
Golf Course	0	0.0000	0.0000	0.0000	0.0000
Government Office Building	134400	22.0494	8.9000e-004	1.8000e-004	22.1263
Hotel	1.50427e+007	2,467.8786	0.0993	0.0206	2,476.4863
Single Family Housing	4.29082e+006	703.9428	0.0283	5.8600e-003	706.3981
Strip Mall	502400	82.4227	3.3200e-003	6.9000e-004	82.7102
Total		**4,479.7734**	**0.1803**	**0.0373**	**4,495.3984**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
City Park	0	0.0000	0.0000	0.0000	0.0000
Condo/Townhouse	6.88753e+006	1,129.9550	0.0455	9.4100e-003	1,133.8961
Elementary School	262849	43.1225	1.7400e-003	3.6000e-004	43.2729
Golf Course	0	0.0000	0.0000	0.0000	0.0000
Government Office Building	134400	22.0494	8.9000e-004	1.8000e-004	22.1263
Hotel	1.50427e+007	2,467.8786	0.0993	0.0206	2,476.4863
Single Family Housing	4.29082e+006	703.9428	0.0283	5.8600e-003	706.3981
Strip Mall	502400	82.4227	3.3200e-003	6.9000e-004	82.7102
Total		**4,449.3709**	**0.1791**	**0.0371**	**4,464.8899**

6.0 Area Detail

6.1 Mitigation Measures Area

Use Electric Lawnmower

Use Electric Leafblower

Use Electric Chainsaw

	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	15.9875	0.6468	14.4682	3.8300e-003		0.1182	0.1182		0.1182	0.1182	0.0000	581.7851	581.7851	0.0329	0.0102	585.6575
Unmitigated	15.9936	0.6478	14.5717	3.8400e-003		0.1188	0.1188		0.1188	0.1188	0.0000	581.9973	581.9973	0.0332	0.0102	585.8777

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	1.2892					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	14.2173					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	0.0564	0.4822	0.2052	3.0800e-003		0.0390	0.0390		0.0390	0.0390	0.0000	558.4629	558.4629	0.0107	0.0102	561.7816
Landscaping	0.4306	0.1656	14.3665	7.6000e-004		0.0799	0.0799		0.0799	0.0799	0.0000	23.5343	23.5343	0.0225	0.0000	24.0961

Total	**15.9936**	**0.6478**	**14.5717**	**3.8400e-003**		**0.1188**	**0.1188**		**0.1188**	**0.1188**	**0.0000**	**581.9973**	**581.9973**	**0.0332**	**0.0102**	**585.8777**

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	1.2892					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	14.2173					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	0.0564	0.4822	0.2052	3.0800e-003		0.0390	0.0390		0.0390	0.0390	0.0000	558.4629	558.4629	0.0107	0.0102	561.7816
Landscaping	0.4246	0.1646	14.2630	7.5000e-004		0.0792	0.0792		0.0792	0.0792	0.0000	23.3222	23.3222	0.0222	0.0000	23.8759
Total	**15.9875**	**0.6468**	**14.4682**	**3.8300e-003**		**0.1182**	**0.1182**		**0.1182**	**0.1182**	**0.0000**	**581.7851**	**581.7851**	**0.0329**	**0.0102**	**585.6575**

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	653.3578	4.0123	0.0993	783.2471
Unmitigated	879.7548	5.0179	0.1246	1,042.3363

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
City Park	0 / 19.5403	35.6158	1.4300e-003	3.0000e-004	35.7400
Condo/Townhouse	91.7369 / 57.8341	330.4854	3.0014	0.0731	427.3014
Elementary School	1.45454 / 3.74026	10.3860	0.0478	1.2000e-003	11.9390
Golf Course	0 / 168.595	307.2948	0.0124	2.5600e-003	308.3666
Government Office Building	1.9866 / 1.21759	7.0933	0.0650	1.5800e-003	9.1897
Hotel	20.2934 / 2.25482	53.8988	0.6632	0.0160	75.2488
Single Family Housing	34.5316 / 21.7699	124.4015	1.1298	0.0275	160.8450
Strip Mall	2.9629 / 1.81597	10.5793	0.0969	2.3600e-003	13.7059
Total		**879.7548**	**5.0179**	**0.1246**	**1,042.3363**

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
City Park	0 / 13.6782	24.9311	1.0000e-003	2.1000e-004	25.0180
Condo/Townhouse	73.3895 / 40.4839	253.8470	2.4007	0.0584	331.2630
Elementary School	1.16364 / 2.61818	7.6270	0.0382	9.6000e-004	8.8671
Golf Course	0 / 118.016	215.1063	8.6600e-003	1.7900e-003	215.8566
Government Office Building	1.58928 / 0.852314	5.4527	0.0520	1.2600e-003	7.1290
Hotel	16.2347 / 1.57838	42.7080	0.5305	0.0128	59.7866
Single Family Housing	27.6253 / 15.239	95.5532	0.9037	0.0220	124.6942
Strip Mall	2.37032 / 1.27118	8.1324	0.0775	1.8900e-003	10.6326
Total		**653.3579**	**4.0123**	**0.0993**	**783.2471**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	406.1930	24.0053	0.0000	1,006.3261
Unmitigated	406.1930	24.0053	0.0000	1,006.3261

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
City Park	1.41	0.2862	0.0169	0.0000	0.7091
Condo/Townhouse	647.68	131.4732	7.7698	0.0000	325.7193
Elementary School	109.5	22.2275	1.3136	0.0000	55.0677
Golf Course	131.59	26.7116	1.5786	0.0000	66.1768
Government Office Building	9.3	1.8878	0.1116	0.0000	4.6770
Hotel	438	88.9100	5.2544	0.0000	220.2709
Single Family Housing	621.56	126.1711	7.4565	0.0000	312.5835
Strip Mall	42	8.5256	0.5039	0.0000	21.1219
Total		**406.1930**	**24.0053**	**0.0000**	**1,006.3261**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
City Park	1.41	0.2862	0.0169	0.0000	0.7091
Condo/Townhouse	647.68	131.4732	7.7698	0.0000	325.7193

Elementary School	109.5	22.2275	1.3136	0.0000	55.0677
Golf Course	131.59	26.7116	1.5786	0.0000	66.1768
Government Office Building	9.3	1.8878	0.1116	0.0000	4.6770
Hotel	438	88.9100	5.2544	0.0000	220.2709
Single Family Housing	621.56	126.1711	7.4565	0.0000	312.5835
Strip Mall	42	8.5256	0.5039	0.0000	21.1219
Total		**406.1930**	**24.0053**	**0.0000**	**1,006.3261**

9.0 Operational Offroad

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

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

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

Boilers

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

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

	Total CO2	CH4	N2O	CO2e
Category	MT			
Unmitigated	-248.2327	0.0000	0.0000	-248.2327

11.1 Vegetation Land Change

Vegetation Type

	Initial/Final	Total CO2	CH4	N2O	CO2e
	Acres	MT			
Grassland	0 / 145.03	625.0793	0.0000	0.0000	625.0793
Grassland	189.54 / 50.74	-598.2280	0.0000	0.0000	-598.2280
Others	14.34 / 5.01	0.0000	0.0000	0.0000	0.0000
Scrub	1470.13 / 962.12	-7,264.5430	0.0000	0.0000	-7,264.5430
Scrub	186.21 / 35.86	-2,150.0050	0.0000	0.0000	-2,150.0050
Scrub	0 / 130.1	1,860.4300	0.0000	0.0000	1,860.4300
Trees	0 / 31.35	3,479.8500	0.0000	0.0000	3,479.8500
Wetlands	8.79 / 8.55	0.0000	0.0000	0.0000	0.0000
Total		**-4,047.4167**	**0.0000**	**0.0000**	**-4,047.4167**

11.2 Net New Trees

Species Class

	Number of Trees	Total CO2	CH4	N2O	CO2e
		MT			
Mixed Hardwood	5176	3,799.1840	0.0000	0.0000	3,799.1840
Total		**3,799.1840**	**0.0000**	**0.0000**	**3,799.1840**