CAMPUS PARK PROJECT

APPENDIX D

AIR QUALITY TECHNICAL REPORT AND GLOBAL CLIMATE CHANGE EVALUATION

SPA 03-008, GPA 03-004, R03-014, VTM 5338 RPL7,
S 07-030, S 07-031, LOG No. 03-02-059
State Clearinghouse No. 2005011092

for the

DRAFT FINAL SUBSEQUENT ENVIRONMENTAL IMPACT REPORT

DECEMBER 3, 2010

FINAL ENVIRONMENTAL IMPACT REPORT
AIR QUALITY/GLOBAL CLIMATE CHANGE TECHNICAL REPORTS
INFORMATION FOR THE READER

This document consists of the Air Quality Technical Report and Global Climate Change Evaluation (2010) for the Campus Park Project (Proposed Project or Project) and analyzes air quality and climate change-related elements associated with construction and operation of the Project. Since circulation of the Project Draft Environmental Impact Report (EIR) and associated technical reports, refinements in Project description have been implemented in response to comments received.

The majority of Project refinements occur west of future Horse Ranch Creek Road and all of them would be south of proposed Harvest Glen Lane. The majority of the developed uses and their construction footprints (residential, office professional, recreational and commercial) remain the same as previously analyzed.

South of future Harvest Glen Lane and west of future Horse Ranch Creek Road, the Proposed Project has been refined to: (1) eliminate some development areas, (2) modify specifics of development detail in some areas, and (3) eliminate the potential for connection to an off-site future wastewater treatment plant (WTP) to be constructed by others. Specifics of road design improvements also vary.

Overall, primary design changes result in 325 fewer multi-family homes (a reduction of 41 percent), an increase in the biological open space preserve of 20.7 acres (or 11 percent). See Figure A for a comparison of the Project evaluated in the Draft EIR with the current plan.

Project refinements relevant to this technical report are addressed below.

Relevant Refinements to Project Description

The analyzed Project footprint included development west of future Horse Ranch Creek Road and north of SR 76 that has now been eliminated or slightly relocated. In addition, changes have been made to specific design of an off-site portion of future Pala Mesa Drive, Pankey Road and on-site Pankey Place. With regard to Pala Mesa Drive/Pankey Road, modifications resulted from a request by the abutting Campus Park West Project to shift a portion of the alignment, and this shift has been worked out in coordination with the Department of Public Works. For on-site Pankey Place, modifications are related to deletion of MF-4 multi-family residential area on the south side of the road, and the retention of open space.

The Draft EIR included two multi-family residential areas (MF-1 and MF-4) west of future Horse Ranch Creek Road and north of SR 76. These areas were proposed to contain a total of 300 residential units sited on a total of 21.1 acres. Both have been eliminated and now would largely be in open space. Within the MF area east of future Horse Ranch Creek Road and south of future Harvest Glen Lane, Draft EIR MF-3 has been renamed MF-1.

Technical Analysis Modifications Based on Project Description Refinements

Air Quality Assessment

The described changes to the Project would result in an overall reduction in the potential extent of Project-related air quality impacts, since there would be a reduction in area sources (i.e., energy use, landscaping, etc.) and the extent of excavation and construction, as well as a reduction in vehicle trips based on fewer proposed residential units. Reductions associated with the refined Project uses were not incorporated and the report is therefore conservative in nature.

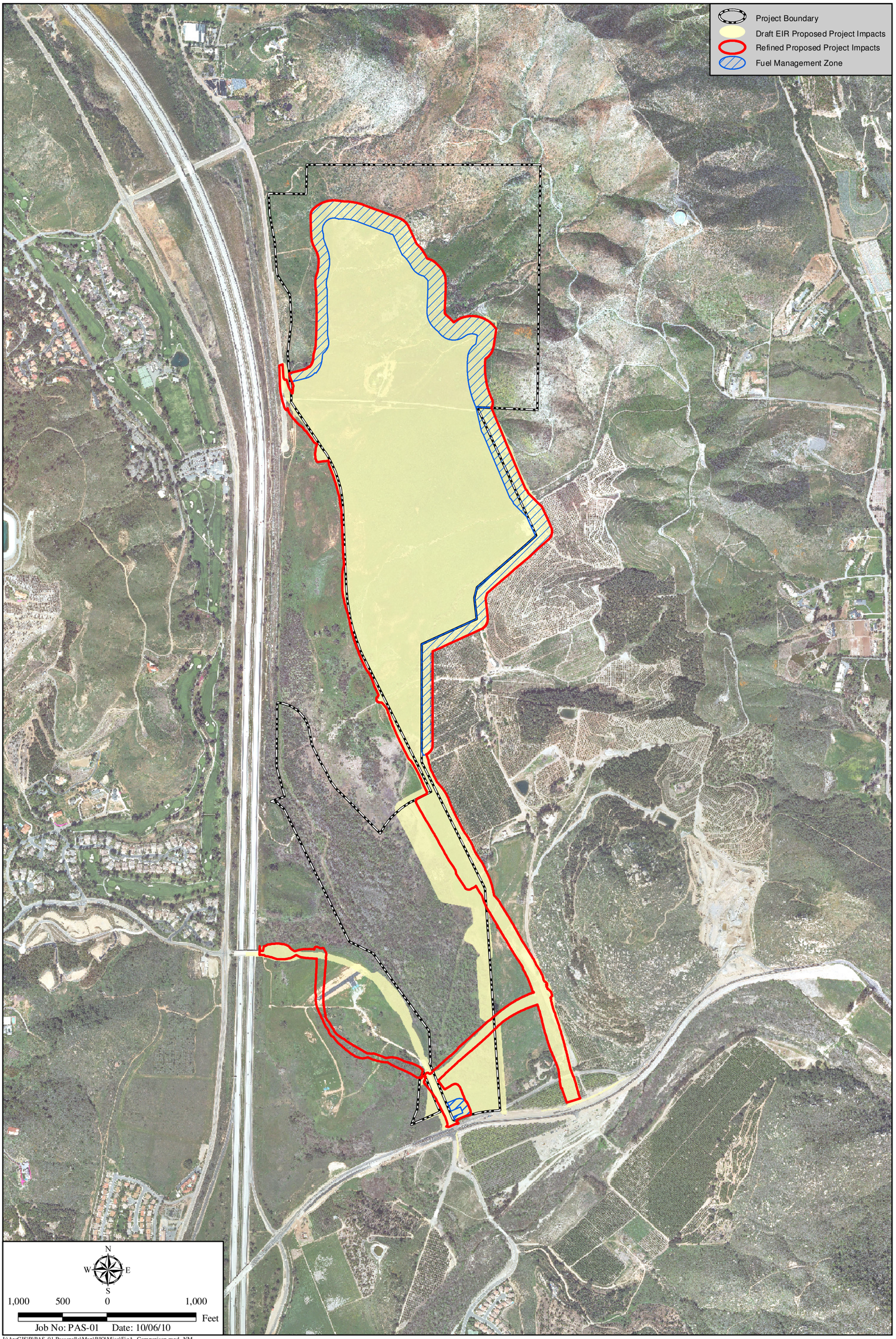
No change to environmental design considerations associated with the refined Project or significance conclusions reached in conformance with the California Environmental Quality Act (CEQA) would occur and no change is required to the attached air quality technical analysis.

Global Climate Change Assessment

Following public review, clarification regarding URBEMIS Modeling and review of reductions in emissions below "business as usual" standards was requested. Clarifying information was provided in a technical memorandum (October 19, 2010), attached to this information sheet. The memorandum addresses changes based on the refined Project (i.e., 325 fewer residential units) that affect global climate change and contains additional URBEMIS modeling. Table 5, Summary of Estimated Operational Greenhouse Gas Emissions, Business as Usual Scenario, of the Global Climate Change Evaluation (Table 2 in the Technical Memorandum) has been corrected to reflect an updated conversion factor. The memorandum references the above-noted URBEMIS model runs and provides information regarding uses within one-quarter mile, the inclusion of local-serving retail within the Project and the presence of existing and planned bike lanes in the vicinity.

No change to environmental design considerations associated with the refined Project or significance conclusions reached in conformance with CEQA would occur and no change is required to the attached global climate change technical analysis.

Each of the above-cited and additional specific revisions are now included as part of the public record and will be before the Board of Supervisors during their consideration of the Project.



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Impact Comparison

CAMPUS PARK

HELIX

Figure A

Scientific Resources Associated
1328 Kaimalino Lane
San Diego, CA 92109

To:	County of San Diego Department of Planning and Land Use	**From:**	Valorie Thompson
Re:	Campus Park Project Global Climate Change Analysis	**Date:**	October 19, 2010

At the request of the County of San Diego Department of Planning and Land Use, SRA has prepared this Technical Memorandum to provide additional information supporting the Global Climate Change Evaluation[1] that was prepared for the Campus Park Project.

Within the Global Climate Change Evaluation, a discussion of the California Air Resources Board's (ARB's) GHG inventory was provided, indicating that the levels of GHG emissions had not yet been approved. The ARB adopted the 2020 emission goal of 427 metric tons of CO2 equivalent gases on December 6, 2007.

The Global Climate Change Evaluation provided an analysis of emissions associated with the Campus Park Project operations that indicated that the project's emissions would be reduced by 34 percent below "business as usual" conditions with implementation of greenhouse gas (GHG) emission reduction measures, including specific project design features (PDFs) and other measures to improve energy efficiency of buildings at the development, water conservation measures, and state and federal vehicle programs designed to reduce GHGs from vehicle use. Table 1 summarizes the results of the analysis that was presented in the Global Climate Change Evaluation showing emissions and emissions with implementation of GHG reduction measures. Table 1 is a reproduction of the table in the original Global Climate Change Evaluation and does not reflect change in the analysis based on County comments.

This Technical Memorandum addresses each category of emissions to provide further documentation of the assumptions in the analysis to support the conclusion that the project will achieve a reduction in GHG emissions of 34 percent. This Technical Memorandum also addresses changes in the Campus Park Specific Plan's development plan, which is proposing to construction 325 fewer residential

[1] Scientific Resources Associated. 2009. Global Climate Change Evaluation for the Campus Park Specific Plan. July 8.

units than were evaluated in the Global Climate Change Evaluation, for a total of 751 units.

Table 1 SUMMARY OF ESTIMATED OPERATIONAL GREENHOUSE GAS EMISSIONS			
Business as Usual			
Emission Source	**Annual Emissions (Metric tons/year)**		
	CO_2	**CH_4**	**N_2O**
Operational Emissions			
Electricity Use Emissions	3,677	0.028	0.015
Natural Gas Use Emissions	1,416	0.016	0.003
Water Consumption Emissions	715	0.005	0.003
Vehicle Emissions	30,956	2	2
Total	36,764	2.05	2.02
Global Warming Potential Factor	**1**	**21**	**310**
CO_2 Equivalent Emissions	36,764	43	627
TOTAL CO_2 Equivalent Emissions	**37,434**		
With GHG Reduction Measures			
Electricity Use Emissions	2,647	0.020	0.011
Natural Gas Use Emissions	1,133	0.13	0.0021
Water Consumption Emissions	629	0.005	0.003
Vehicle Emissions[a]	19,812	1.3	1.3
Total	24,221	1.4	1.3
Global Warming Potential Factor	**1**	**21**	**310**
CO_2 Equivalent Emissions	24,221	29	403
TOTAL CO_2 Equivalent Emissions	**24,653**		
Percent Reduction from Business As Usual	**34%**		

[a]Accounting for reductions estimated through state vehicle emission reduction programs amounting to 28% reduction in GHG, and through mixed-use development goals and bicycle/pedestrian access, assumed to reduce vehicle emissions by an additional 8% based on URBEMIS Model assumptions for a total of 36%.

Existing GHG Emission Sources

The Campus Park site is currently used for livestock grazing. Approximately 50 head of cattle currently use the site. According to EPA[2], adult cows produce 80 to 110 kilograms of methane annually. Assuming the average cow produces 95 kilograms of methane, a total of 4,750 kilograms of methane are produced annually at the site due to livestock grazing. Methane's global warming potential is 21; therefore, it is estimated that livestock produce approximately 100 metric tons annually of CO_2e at the Campus Park site. Additional GHG emissions would be associated with vehicles and farming equipment used at the site; however, specific information is not available that would allow the calculation of GHG emissions from these sources.

Electricity and Natural Gas Use

[2] USEPA. 2010. http://www.epa.gov/rlep/faq.html

The calculations in this analysis take into account the following PDF:

- Buildings at Campus Park will build the project to current 2008 Title 24 standards.

The analysis assumed that the "current" Title 24 standards were those standards in effect when the ARB developed its initial 1990 and 2004 Greenhouse Gas Inventory, which was published in November 2007. The Title 24 standards in effect at that time were Title 24 as of 2005. Current (2008) Title 24 standards represent a 15% improvement over Title 24 as of 2005[3]. Electricity and natural gas "business as usual" emissions are therefore calculated using 2005 Title 24 standards, and reductions are credited based on the project's compliance with 2008 Title 24 standards. Thus the project will exceed 2005 Title 24 standards by 15% by complying with 2008 Title 24 standards.

Because many of the PDFs are not quantifiable as to their percent reduction of GHG emissions from specific energy efficiency measures, no credit was taken for other GHG reduction measures identified as PDFs, nor was credit taken for the California Renewables Portfolio Standard (RPS) Program that were adopted under Senate Bill (SB) 1078, which was enacted in 2002. SB 1078 initially set a target of 20% of energy to be sold by retail sellers of electricity from renewable sources by the year 2017. The schedule for implementation of the RPS was accelerated in 2006 with the Governor's signing of SB 107, which accelerated the 20% RPS goal from 2017 to 2010. On November 17, 2008, the Governor signed Executive Order S-14-08, which requires all retail sellers of electricity to serve 33 percent of their load with renewable energy by 2020. The Governor signed Executive Order S-21-09 on September 15, 2009, which directs ARB to implement a regulation consistent with the 2020 33% renewable energy target by July 31, 2010.

According to the San Diego County Greenhouse Gas Inventory (SDCGHGI) prepared by the University of San Diego[4], implementation of the 20% RPS goal by 2010 would reduce GHG emissions by a further 14% from 2006 levels; the SDCGHGI estimated that San Diego Gas and Electric was providing 6% of its electricity from renewable resource in 2006. Implementation of the 33% target by 2020 would increase the renewable percentage and thereby reduce GHG emissions by an additional 13%. Thus implementation of Executive Order S-21-09 will serve to reduce GHG emissions by a total of 27% below 2006 levels.

Implementation of the RPS will affect indirect GHG emissions associated with electricity use for the Campus Park Project because electricity will be purchased from San Diego Gas and Electric.

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[3] Eden, D. 2009. *Energy Efficiency Actions and Title 24 2008 Changes*. Presentation for the New Solar Homes Partnership Staff Workshop. April 10. http://www.energy.ca.gov/renewables/06-NSHP-1/documents/2009-04-10_workshop/presentations/Eden-Energy_Efficiency_and_2008_Standards.pdf

[4] University of San Diego, Energy Policy Initiatives Center. 2008. San Diego County Greenhouse Gas Inventory. September.

To account for the implementation of the RPS as specified in SB 1078, a 14% reduction in GHG emissions was assumed. While implementation of Executive Order S-21-09 will result in additional GHG reductions of 27% below 2006 levels, no additional credit was taken for these reductions because they have not yet been promulgated or adopted by the ARB. A calculation showing the effect of accounting for both exceeding 2005 Title 24 standards by 15% and the RPS (which reduces GHG by 14%) is shown in Attachment A.

No additional measures were included in the calculation of GHG emissions for natural gas usage beyond Campus Park's commitment to exceed Title 24 standards by 15%.

Water Use

As indicated in the Global Climate Change Evaluation, water usage was assumed to be reduced by 12% due to use of reclaimed water. This reduction does not take into account other PDFs that were identified by the Campus Park Project as listed below:

- Install water-saving irrigation systems
- The project developer shall install landscapes that meet the requirements of the California Model Water Efficient Landscape Ordinance in accordance with Section 6717c.1 of the County's Zoning Ordinance on developer-installed residential landscapes in common areas. The County's Water Conservation and Landscape Design Manual implements Zoning Ordinance Section 6712(d) which requires efficient irrigation uses (including rain sensors), transitional zones, use of native plantings, restriction on turf, use of mulch, the preservation of existing vegetation and natural features, and the use of recycled water when available. Use recycled water for irrigation where available
- Campus Park will comply with state and local ordinances requiring water conservation, including California Plumbing Code Section 402, which requires the installation of water conserving fixtures in new construction and Section 67.101 of the County's Code of Regulatory Ordinances, which prohibits water waste.

Outdoor water use accounts for 58% of average US residential water use. Based on a study conducted by the Irvine Ranch Water District[5], use of drought resistant plants reduced irrigation water usage by 29% from "business as usual" conditions, which are defined as landscaping with predominantly turfgrass. According to a 2001 study by the Irvine Ranch Water District and other water resource agencies in southern California[6], use of weather-based irrigation controllers that are designed to operate based on water needs reduced residential water usage by 7% overall, and residential

[5] Sanchez, Fiona. 2006. "Impact of Landscape Plant Palettes and Community Development Planning on Irrigation Water Use." Irvine Ranch Water District. February 6. https://www.awwa.org/waterwiser/references/pdfs/RES_LSCAPE_Sanchez_F_Impact_of_Landscape_Plant_Palettes.pdf

[6] Hunt, T., D. Lessick, J. Berg, J. Wiedmann, T. Ash, D. Pagano, M. Marian, A. Bamezai. 2001. "Residential Weather-Based Irrigation Scheduling: Evidence from the Irvine ET Controller Study." June.

irrigation water use by 16%. According to a study by Consol[7], the use of Weather Based Irrigation Controllers can reduce the amount of landscape over-watering by 85%.

The 2008 California Green Building Standards Code sets new standards for the flow rate of fixtures in new construction. These standards come into effect in 2011 and will call for a 20% reduction in indoor water use. Campus Park has committed to installing low-flow appliances (toilets and shower heads) in the Campus Park Project. According to the Consol study, water use reduction in a current new home versus a home that meets the Green Building Standards will reduce water use by 22%. However, based on the County's request, no credit was taken for this reduction in water usage.

Implementation of the RPS will also affect indirect GHG emissions associated with water usage because the embodied energy of water takes into account the utility energy required to obtain, transport, treat, and dispose of potable water. Implementation of the RPS will reduce the GHGs associated with the embodied energy of water by 14%. A calculation showing the effect of accounting for both compliance with the 2011 Green Building Standard and the RPS (which reduces GHG by 14%), without accounting for use of reclaimed water, is shown in Attachment A.

Vehicle Emissions

The Global Climate Change Evaluation took into account implementation of both the Pavley fuel efficiency standards and the Low Carbon Fuel Standard (LCFS) to calculate reductions from "business as usual" vehicle emissions. According to the SDCGHGI, the Pavley fuel efficiency standards would reduce GHG emissions by 20% by the year 2020. The LCFS would account for a further GHG emission reduction of 10% by the year 2020. In the Global Climate Change Evaluation, for conservative purposes, these measures were assumed to result in a 28% reduction in GHG emissions; however, as discussed, the state of California anticipates these programs will reduce vehicular GHG emissions by 30%.

In addition to the Pavley fuel efficiency standards and the LCFS, included in the ARB's Scoping Plan (ARB 2008) are strategies to reduce emissions by increasing efficiency, optimizing aerodynamics, and converting combustion-only vehicles to hybrids. According to the SDCGHGI, although these on-road emissions reduction measures are intended for implementation at the state level, several on-road transportation strategies were scaled down to San Diego County using data related to CO2E emissions, vehicle population, and vehicle type. When scaled down, the ARB's transportation efficiency, aerodynamics, and hybrid conversion strategies translate to an emissions reduction of 0.6 MMT CO2E for San Diego County by

[7] Consol. 2010. "Water Use in the California Residential Home." Prepared for the California Homebuilding Foundation. January.

2020, which amounts to a reduction in vehicle emissions of approximately 3%. The Scoping Plan measures apply to both light-duty vehicles (Measure T-4) and medium and heavy-duty vehicles (Measures T-7 and T-8). Measure T-4 includes such vehicle efficiency measures as implementation of a properly inflated tire program, use of low-friction engine oils, requiring solar-reflective automotive paints and window glazing, and implementing a tire tread program that develops and adopts tire rolling resistance standards. Measure T-7 would require existing trucks and trailers to be retrofitted with the best available technology and/or ARB approved technology. The retrofits would improve fuel efficiency of trucks by including devices that reduce aerodynamic drag and rolling resistance. Measure T-8 will require medium and heavy-duty vehicles to be converted to hybrid vehicles; these vehicles include parcel delivery trucks and vans, utility trucks, garbage trucks, buses, and other vocational work trucks.

According to the Scoping Plan, Measure T-4 would result in a reduction in GHG emissions from light-duty vehicles of 4.5 MMT CO2E by 2020 (a reduction of 2.0% from business as usual emissions); Measure T-7 would result in a reduction in GHG emissions from heavy-duty vehicles of 0.93 MMT CO2E by 2020 (a reduction of 0.4% from business as usual emissions); and Measure T-8 would result in a reduction in GHG emissions from medium- and heavy-duty vehicles of 0.5 MMT CO2E by 2020 (a reduction of 0.2% from business as usual emissions). Because the project would not generate substantial heavy-duty truck traffic, it is appropriate to include the reductions in GHG emissions associated with Measures T-4 and T-8, but not with Measure T-7. The associated GHG emission reductions would be 2.2% from business as usual.

In addition, the Global Climate Change Evaluation identified PDFs that would serve to further reduce vehicle miles traveled (VMT), and used the URBEMIS 2007 Model to calculate VMT reductions anticipated from the following PDFs:

- Have at least three of the following on site and/or offsite within one-quarter mile: Residential Development, Retail Development, Park, Open Space, or Office.

- Project includes local-serving retail.

- Entire project is located within one-half mile of an existing/planned Class I or Class II bike lane and project design includes a comparable network that connects the project to the existing offsite facility. Project design includes a designated bicycle route connecting all units, on-site bicycle parking facilities, offsite bicycle facilities, site entrances, and primary building entrances to existing Class I or Class II bike lane(s) within one-half mile. Bicycle route connects to all streets contiguous with project site. Bicycle route has minimum conflicts with automobile parking and circulation facilities. All streets internal to the project wider than 75 feet have Class II bicycle lanes on both sides.

The URBEMIS Model runs (included as Attachment B) indicate that these VMT reduction measures would reduce GHG emissions by an additional 6.78% from

"business as usual" levels beyond the reductions anticipated for implementation of the Pavley fuel efficiency standard and the LCFS.

Calculations showing the reduction in VMT and emissions are provided in Attachment A.

Summary

Table 2 provides an updated calculation of GHG emission reductions anticipated for the Campus Park Project with the revised development plan, taking into account implementation of the RPS (assuming a 20% renewable energy target), water conservation measures, implementation of vehicle GHG reduction programs, and PDFs designed to reduce VMT. Business as usual emissions for natural gas were corrected to reflect the current proposed design, and were corrected in Table 2 to reflect an updated conversion factor.

Table 2 UPDATED SUMMARY OF ESTIMATED OPERATIONAL GREENHOUSE GAS EMISSIONS			
Business as Usual			
Emission Source	**Annual Emissions (Metric tons/year)**		
	CO_2	**CH_4**	**N_2O**
Operational Emissions			
Electricity Use Emissions	2,915	0.022	0.012
Natural Gas Use Emissions	2,072	0.23	0.0039
Water Consumption Emissions	715	0.005	0.003
Vehicle Emissions	26,920	1.45	1.58
Total	32,662	1.71	1.60
Global Warming Potential Factor	**1**	**21**	**310**
CO_2 Equivalent Emissions	32,662	36	496
TOTAL CO_2 Equivalent Emissions	**33,194**		
With GHG Reduction Measures			
Electricity Use Emissions	2,128	0.016	0.009
Natural Gas Use Emissions	1,761	0.20	0.0033
Water Consumption Emissions	616	0.005	0.003
Vehicle Emissions	17,317	0.97	1.21
Total	21,822	1.19	1.23
Global Warming Potential Factor	**1**	**21**	**310**
CO_2 Equivalent Emissions	21,822	25	381
TOTAL CO_2 Equivalent Emissions	**22,228**		
Percent Reduction from Business As Usual	**33.04%**		

As shown in Table 2, GHG emissions would be reduced by more than 33%, as indicated in the Global Climate Change Evaluation, with implementation of quantifiable emission reductions including implementation of additional measures including the RPS, Pavley fuel efficiency standards, and LCFS. A summary of the

specific emission reductions that would be achieved by the project is provided in Table 3.

Table 3 Summary of Emission Reductions with Implementation of GHG Reduction Measures		
Transportation Emissions		
Business as Usual, CO2e		**27,441**
Reductions due to Statewide Measures		
Measure	**Percent Reduction**	**Emissions Reduction**
Pavley Motor Vehicle Standards	20%	5,690
Improved Vehicle Efficiency/Hybridization	2.20%	578
Low Carbon Fuel Standard	10% (CO2 and CH4)	2,264
Mix of Uses	Negative (-1.34)	
Local Serving Retail	2.03%	
Bike and Pedestrian	8.13%	
Total Project Design Features	6.78%	1,197
Total Reductions	38.98%	**9,729**
Net Transportation Emissions		**17,712**

Operational Emissions		
Business as Usual, CO2e		**5,709**
Reductions due to Project Design Features and Statewide Measures		
Measure	**Percent Reduction**	**Emissions Reduction**
Renewable Portfolio Standard (20% renewables)	14% (electricity and embodied energy of water)	508
Meet 2008 Title 24 Standards	15% electricity and natural gas	688
Total Reductions		**1,196**
Net Operational Emissions		**4,513**

The project would therefore meet the requirements of a less than significant impact under the newly adopted CEQA guidelines, in that it would not:

- Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment.

- Conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases.

The Campus Park Project's emissions would not have a significant impact on the environment because they would meet the requirements of AB 32 to reduce GHG emissions below "business as usual" levels by more than the 33% projected in the SDCGHGI for San Diego County. The project would also not conflict with the requirements of AB 32 and regulations adopted currently.

AB 32 also sets forth a goal to reduce GHG emissions by 80% by the year 2050. This level of reduction will require a shift in technology from currently available technologies to generate electricity and for transportation away from fossil fuels such as natural gas and gasoline, and will require new technologies to be developed. It is not possible at this time to speculate as to what new technologies will be developed to meet the 2050 goal of reducing emissions by 80% from current levels.

Attachment A

Greenhouse Gas Emission Calculations

Table A-1
Electricity Greenhouse Gases
Business as Usual
Campus Park

Electricity

Land Use	1,000 Sqft	Usage Rate [a] (kWh\sq.ft\yr)	(KWh\year)	MWh\year
Project			0	0.00
Office	157.0	12.95	2,033,150	2033.15
Retail	61.2	13.55	829,260	829.26
Hotel/Motel		9.95	0	0.00
Restaurant		47.45	0	0.00
Food Store		53.30	0	0.00
Warehouse		4.35	0	0.00
Cinema		11.55	0	0.00
High School		10.50	0	0.00
Elementary School		5.90	0	0.00
Hospital		21.70	0	0.00
Library		10.50	0	0.00
Residential (DU)	751.0	5,914	4,441,414	4441.41
Total Project			**7,303,824**	**7303.82**

[a] Electricity Usage Rates from Table A9-11-A, CEQA Air Quality Handbook, SCAQMD, 1993.

GHG	lbs/MWh[b]	lbs	metric tons	CO_2E
Project				
CO_2	878.71	6417943.187	2911.127686	2911.127686
CH_4	0.0067	48.9356208	0.022196806	0.466132928
N_2O	0.0037	27.0241488	0.012257938	3.799960688
				2915.39 **Total Annual CO2E**

[b] Emission factors for CO_2, CH_4, and N_2O were derived from the California Climate Action Registry General Reporting Protocol; Version 3.1, January 2009

Table A-2
Natural Gas Greenhouse Gas Emissions
Business as Usual
Campus Park

Natural Gas

Land Use	1,000 Sqft	Usage Rate[c] (cu.ft\sq.ft\mo)	Total Natural Gas Usage (cu.ft\mo)	Total Natural Gas Usage (cu.ft\year)	Total Natural Gas Usage (MMBTU\year)
Project					
Office	157.0	2.0	314,000	3,768,000	
Retail	61.2	2.9	177,480	2,129,760	2,172
Hotel/Motel	0.0	4.8	-	-	-
Restaurant	0.0	4.8	-	-	-
Food Store	0.0	2.9	-	-	-
Warehouse	0.0	2.0	-	-	-
Cinema	0.0	4.8	-	-	-
High School	0.0	2.9	-	-	-
Elementary School	0.0	2.0	-	-	-
Hospital	0.0	4.8	-	-	-
Library	0.0	2.9	-	-	-
Residential (DU)	751.0	4,012	3,012,637	36,151,638	36,875
Total Project			3,504,117	**42,049,398**	**39,047**

[a] Natural Gas Usage Rates from Table A9-12-A, CEQA Air Quality Handbook, SCAQMD, 1993.

GHG	Kg/MMBtu[b]	Kg	metric tons	CO_2E (Metric Tons)
Project				
CO_2	53.06	2,071,835.20	2,071.84	2,071.84
CH_4	0.0059	230.38	0.23	4.84
N_2O	0.0001	3.90	0.0039	1.21

2077.88 Total Annual CO2E

[b] Emission factors for CO_2, CH_4, and N_2O were derived from the California Climate Action Registry General Reporting Protocol; Version 3.1, January 2009

Table A-3
Water Consumption Greenhouse Gas Emissions
Business as Usual
Campus Park

Land Use	GPD	Usage Rate (kWh\gal)	(KWh\year)	MWh\year
Project	578300	8500	1,794,176	1794.18

[a] Electricity Usage Rates from Table A9-11-A, CEQA Air Quality Handbook, SCAQMD, 1993.

GHG	lbs/MWh[b]	lbs	metric tons	CO_2E
Project				
CO_2	878.71	1576560.173	715.1150821	715.1150821
CH_4	0.0067	12.02097753	0.005452619	0.114505004
N_2O	0.0037	6.638450275	0.003011148	0.933455861
				716.16 Total Annual CO2E

[b] Emission factors for CO_2, CH_4, and N_2O were derived from the California Climate Action Registry General Reporting Protocol; Version 3.1, January 2009

Table A-4
Electricity Greenhouse Gases
with GHG Reduction Measures
Campus Park

Electricity

Land Use	1,000 Sqft	Usage Rate [a] (kWh\sq.ft\yr)	(KWh\year)	MWh\year
Project			0	0.00
Office	157.0	11.01	1,728,178	1728.18
Retail	61.2	11.52	704,871	704.87
Hotel/Motel		9.95	0	0.00
Restaurant		47.45	0	0.00
Food Store		53.30	0	0.00
Warehouse		4.35	0	0.00
Cinema		11.55	0	0.00
High School		10.50	0	0.00
Elementary School		5.90	0	0.00
Hospital		21.70	0	0.00
Library		10.50	0	0.00
Residential (DU)	751.0	5,027	3,775,202	3775.20
Total Project			**6,208,250**	**6208.25**

[a] Electricity Usage Rates from Table A9-11-A, CEQA Air Quality Handbook, SCAQMD, 1993.

GHG	lbs/MWh[b]	lbs	metric tons	CO_2E
Project				
CO_2	755.6906	4691516.47	2128.034339	2128.034339
CH_4	0.005762	35.7719388	0.016225865	0.340743171
N_2O	0.003182	19.75465277	0.008960552	2.777771263
				2131.15 **Total Annual CO2E**

[b] Emission factors for CO_2, CH_4, and N_2O were derived from the California Climate Action Registry General Reporting Protocol; Version 3.1, January 2009

Table A-5
Natural Gas Greenhouse Gas Emissions
with GHG Reduction Measures
Campus Park

Natural Gas

Land Use	1,000 Sqft	Usage Rate[c] (cu.ft\sq.ft\mo)	Total Natural Gas Usage (cu.ft\mo)	Total Natural Gas Usage (cu.ft\year)	Total Natural Gas Usage (MMBTU\year)
Project					
Office	157.0	1.7	266,900	3,202,800	
Retail	61.2	2.5	150,858	1,810,296	1,847
Hotel/Motel	0.0	4.8	-	-	-
Restaurant	0.0	4.8	-	-	-
Food Store	0.0	2.9	-	-	-
Warehouse	0.0	2.0	-	-	-
Cinema	0.0	4.8	-	-	-
High School	0.0	2.9	-	-	-
Elementary School	0.0	2.0	-	-	-
Hospital	0.0	4.8	-	-	-
Library	0.0	2.9	-	-	-
Residential (DU)	751.0	3,410	2,560,741	30,728,892	31,343
Total Project			2,978,499	**35,741,988**	**33,190**

[a] Natural Gas Usage Rates from Table A9-12-A, CEQA Air Quality Handbook, SCAQMD, 1993.

GHG	Kg/MMBtu[b]	Kg	metric tons	CO_2E (Metric Tons)
Project				
CO_2	53.06	1,761,059.92	1,761.06	1,761.06
CH_4	0.0059	195.82	0.20	4.11
N_2O	0.0001	3.32	0.0033	1.03

1766.20 Total Annual CO2E

[b] Emission factors for CO_2, CH_4, and N_2O were derived from the California Climate Action Registry General Reporting Protocol; Version 3.1, January 2009

Table A-6
Water Consumption Greenhouse Gas Emissions
with GHG Reduction Measures
Campus Park

Land Use	GPD	Usage Rate (kWh\gal)	(KWh\year)	MWh\year
Project	578300	8500	1,794,176	1794.18

[a] Electricity Usage Rates from Table A9-11-A, CEQA Air Quality Handbook, SCAQMD, 1993.

GHG	lbs/MWh[b]	lbs	metric tons	CO_2E
Project				
CO_2	755.6906	1355841.749	614.9989706	614.9989706
CH_4	0.005762	10.33804067	0.004689253	0.098474303
N_2O	0.003182	5.709067237	0.002589587	0.80277204
				615.90 **Total Annual CO2E**

[b] Emission factors for CO_2, CH_4, and N_2O were derived from the California Climate Action Registry General Reporting Protocol; Version 3.1, January 2009

Table A-7
Project-Related Traffic GHG Emissions
Campus Park Project

External Trips

Vehicle Class	Number of Daily Trips	Speed (mph)	VMT (mi/vehicle-day)	Total VMT	CO2 Running Exhaust (g/mi)	CO2 Start-Up (g/start)[a]	CH4 Running Exhaust (g/mi)	CH4 Start-Up (g/start)[a]	N2O Running Exhaust (g/mi)	N2O Start-Up (g/start)[a]	Emissions without GHG Reductions, metric tons/year CO2	CH4	N2O
Light-duty auto	9468	33	17.1	161909.98	319.478	162.144	0.016	0.034	0.017385	0.034865	19441	1.06	1.15
Light-duty truck	2671	33	17.1	45666.918	398.704	196.19	0.017	0.028	0.01919	0.03344	6837	0.31	0.35
	12139			207577									
											26278	**1.37**	**1.50**

Assuming 2015 Emission Factors, EMFAC2007, startup after 8 hours

Internal Trips

Vehicle Class	Number of Daily Trips	Speed (mph)	VMT (mi/vehicle-day)	Total VMT	CO2 Running Exhaust (g/mi)	CO2 Start-Up (g/start)[a]	CH4 Running Exhaust (g/mi)	CH4 Start-Up (g/start)[a]	N2O Running Exhaust (g/mi)	N2O Start-Up (g/start)[a]	Emissions without GHG Reductions, tons/year CO2	CH4	N2O
Light-duty auto	4058	33	0.5	2028.78	319.478	162.144	0.016	0.034	0.017385	0.034865	477	0.06	0.06
Light-duty truck	1144	33	0.5	572.22	398.704	196.19	0.017	0.028	0.01919	0.03344	165	0.02	0.02
	5202			2601									
											642	**0.08**	**0.08**

Assuming 2015 Emission Factors, EMFAC2007, startup after 1 hour

Total metric tons	26920	1.45	1.58
Total metric tons CO2e	27441		

Table A-8
Project-Related Traffic GHG Emissions with GHG Reductions
Campus Park Project

External Trips

Vehicle Class	Number of Daily Trips	Speed (mph)	VMT (mi/vehicle-day)	Total VMT	Vehicle Fuel Efficiency Mi/gallon	Pavley/CAFE Fuel Efficiency Reduction	Low Carbon Fuel Standard Reduction	Vehicle Efficiency/ Hybridization Reduction	VMT Reduction Measures Reduction	CO2 Running Exhaust (g/mi)	CO2 Start-Up (g/start)[a]	CH4 Running Exhaust (g/mi)	CH4 Start-Up (g/start)[a]	N2O Running Exhaust (g/mi)	N2O Start-Up (g/start)[a]	Emissions with GHG and VMT Reductions, tons/year CO2	CH4	N2O
Light-duty auto	9468	33	15.94062	150932.49		20%	10%	2.20%	6.78%	216.6061	145.9296	0.010848	0.0306	0.013526	0.034865	12437	0.70	0.87
Light-duty truck	2671	33	15.94062	42570.701		20%	10%	2.20%	6.78%	270.3213	176.571	0.011526	0.0252	0.01493	0.03344	4373	0.20	0.26
	12139			193503	26.65													
																16810	**0.91**	**1.13**

Assuming 2015 Emission Factors, EMFAC2007, startup after 8 hours

Internal Trips

Vehicle Class	Number of Daily Trips	Speed (mph)	VMT (mi/vehicle-day)	Total VMT	Fuel Efficiency Mi/gallon	Pavley/CAFE Fuel Efficiency Reduction	Low Carbon Fuel Standard Reduction	Efficiency/ Hybridization Reduction	No credit taken for internal trips	CO2 Running Exhaust (g/mi)	CO2 Start-Up (g/start)[a]	CH4 Running Exhaust (g/mi)	CH4 Start-Up (g/start)[a]	N2O Running Exhaust (g/mi)	N2O Start-Up (g/start)[a]	Emissions with GHG and VMT Reductions, tons/year CO2	CH4	N2O
Light-duty auto	4058	33	0.5	2028.78		20%	10%	2.20%		216.6061	145.9296	0.010848	0.0306	0.013526	0.034865	377	0.05	0.06
Light-duty truck	1144	33	0.5	572.22		20%	10%	2.20%		270.3213	176.571	0.011526	0.0252	0.01493	0.03344	130	0.01	0.02
	5202			2601	26.65													
																507	**0.07**	**0.08**

Assuming 2015 Emission Factors, EMFAC2007, startup after 1 hour

Total metric tons	17317	0.97	1.21
Total metric tons CO2e	17712		

Table A-9
Summary of GHG Emission Reduction Measures
Campus Park Project

Transportation Emissions		
Business as Usual, CO2e		**27441**
Reductions due to Statewide Measures		
Measure	**Percent Reduction**	**Emissions Reduction**
Pavley Motor Vehicle Standards	20%	5690
Improved Vehicle Efficiency/Hybridization	2.20%	578
Low Carbon Fuel Standard	10% (CO2 and CH4)	2264
Mix of Uses	Negative (-1.34)	
Local-Serving Retail	2.03%	
Bike and Pedestrian Access	8.13%	
Project Design Features (overall)	6.78%	1197
Total Reductions		**9729**
Net Transportation Emissions		**17712**

Operational Emissions		
Business as Usual, CO2e		**5709.44**
Reductions due to Project Design Features and Statewide Measures		
Measure	**Percent Reduction**	**Emissions Reduction**
Renewable Portfolio Standard (20% renewables)	14% (electricity and embodied energy of water)	508
Meet 2008 Title 24 Standards	15% electricity and natural gas	688
Total Reductions		**1196**
Net Operational Emissions		**4513**

Attachment B

URBEMIS Model Run

Overall URBEMIS Model Run

10/19/2010 4:58:22 PM

Urbemis 2007 Version 9.2.4

Combined Annual Emissions Reports (Tons/Year)

File Name: C:\Urbemis\Urbemis 9.2.2\Projects\Campus Park Vehicle GHG Emissions.urb924

Project Name: Campus Park

Project Location: California State-wide

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (tons/year, unmitigated)	19.02	31.04	230.85	0.18	35.59	6.94	19,154.85
TOTALS (tons/year, mitigated)	17.78	28.93	215.19	0.17	33.16	6.47	17,855.39
Percent Reduction	6.52	6.80	6.78	5.56	6.83	6.77	6.78

SUM OF AREA SOURCE AND OPERATIONAL EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (tons/year, unmitigated)	19.02	31.04	230.85	0.18	35.59	6.94	19,154.85

Both Area and Operational Mitigation must be turned on to get a combined mitigated total.

10/19/2010 4:58:22 PM

Operational Unmitigated Detail Report:

OPERATIONAL EMISSION ESTIMATES Annual Tons Per Year, Unmitigated

Source	ROG	NOX	CO	SO2	PM10	PM25	CO2
Single family housing	9.37	15.18	113.80	0.09	17.47	3.41	9,418.44
Condo/townhouse general	3.36	5.36	40.19	0.03	6.17	1.20	3,326.28
Strip mall	3.36	5.64	41.16	0.03	6.34	1.24	3,400.48
General office building	2.93	4.86	35.70	0.03	5.61	1.09	3,009.65
TOTALS (tons/year, unmitigated)	19.02	31.04	230.85	0.18	35.59	6.94	19,154.85

Operational Mitigated Detail Report:

OPERATIONAL EMISSION ESTIMATES Annual Tons Per Year, Mitigated

Source	ROG	NOX	CO	SO2	PM10	PM25	CO2
Single family housing	8.80	14.21	106.50	0.08	16.35	3.19	8,814.78
Condo/townhouse general	3.11	4.93	36.97	0.03	5.67	1.11	3,059.79
Strip mall	3.13	5.26	38.41	0.03	5.91	1.15	3,172.74
General office building	2.74	4.53	33.31	0.03	5.23	1.02	2,808.08
TOTALS (tons/year, mitigated)	17.78	28.93	215.19	0.17	33.16	6.47	17,855.39

Operational Settings:

Does not include correction for passby trips

Does not include double counting adjustment for internal trips

Analysis Year: 2010 Season: Annual

Emfac: Version : Emfac2007 V2.3 Nov 1 2006

10/19/2010 4:58:22 PM

Summary of Land Uses

Land Use Type	Acreage	Trip Rate	Unit Type	No. Units	Total Trips	Total VMT
Single family housing	173.67	10.00	dwelling units	521.00	5,210.00	55,342.71
Condo/townhouse general	14.38	8.00	dwelling units	230.00	1,840.00	19,545.22
Strip mall		42.94	1000 sq ft	62.00	2,662.28	20,086.90
General office building		11.01	1000 sq ft	150.00	1,651.50	17,774.27
					11,363.78	112,749.10

Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	48.9	1.2	98.4	0.4
Light Truck < 3750 lbs	10.9	2.8	91.7	5.5
Light Truck 3751-5750 lbs	21.7	0.9	98.6	0.5
Med Truck 5751-8500 lbs	9.5	1.1	98.9	0.0
Lite-Heavy Truck 8501-10,000 lbs	1.7	0.0	76.5	23.5
Lite-Heavy Truck 10,001-14,000 lbs	0.6	0.0	50.0	50.0
Med-Heavy Truck 14,001-33,000 lbs	1.0	0.0	20.0	80.0
Heavy-Heavy Truck 33,001-60,000 lbs	0.9	0.0	0.0	100.0
Other Bus	0.1	0.0	0.0	100.0
Urban Bus	0.1	0.0	0.0	100.0
Motorcycle	3.5	68.6	31.4	0.0
School Bus	0.1	0.0	0.0	100.0
Motor Home	1.0	0.0	90.0	10.0

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Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	17.1	7.3	7.5	17.1	7.4	7.4
Rural Trip Length (miles)	17.1	7.1	7.9	17.1	6.6	6.6
Trip speeds (mph)	35.0	35.0	35.0	35.0	35.0	35.0
% of Trips - Residential	32.9	18.0	49.1			
% of Trips - Commercial (by land use)						
Strip mall				2.0	1.0	97.0
General office building				35.0	17.5	47.5

URBEMIS Model Run

Accounting for Mix of Uses

10/19/2010 4:59:02 PM

Urbemis 2007 Version 9.2.4

Combined Annual Emissions Reports (Tons/Year)

File Name: C:\Urbemis\Urbemis 9.2.2\Projects\Campus Park Vehicle GHG Emissions.urb924

Project Name: Campus Park

Project Location: California State-wide

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (tons/year, unmitigated)	19.02	31.04	230.85	0.18	35.59	6.94	19,154.85
TOTALS (tons/year, mitigated)	19.26	31.46	233.95	0.18	36.06	7.03	19,412.08
Percent Reduction	-1.26	-1.35	-1.34	0.00	-1.32	-1.30	-1.34

SUM OF AREA SOURCE AND OPERATIONAL EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (tons/year, unmitigated)	19.02	31.04	230.85	0.18	35.59	6.94	19,154.85

Both Area and Operational Mitigation must be turned on to get a combined mitigated total.

10/19/2010 4:59:02 PM

Operational Unmitigated Detail Report:

OPERATIONAL EMISSION ESTIMATES Annual Tons Per Year, Unmitigated

Source	ROG	NOX	CO	SO2	PM10	PM25	CO2
Single family housing	9.37	15.18	113.80	0.09	17.47	3.41	9,418.44
Condo/townhouse general	3.36	5.36	40.19	0.03	6.17	1.20	3,326.28
Strip mall	3.36	5.64	41.16	0.03	6.34	1.24	3,400.48
General office building	2.93	4.86	35.70	0.03	5.61	1.09	3,009.65
TOTALS (tons/year, unmitigated)	19.02	31.04	230.85	0.18	35.59	6.94	19,154.85

Operational Mitigated Detail Report:

OPERATIONAL EMISSION ESTIMATES Annual Tons Per Year, Mitigated

Source	ROG	NOX	CO	SO2	PM10	PM25	CO2
Single family housing	9.48	15.38	115.24	0.09	17.69	3.45	9,537.94
Condo/townhouse general	3.41	5.45	40.83	0.03	6.27	1.22	3,379.03
Strip mall	3.40	5.71	41.71	0.03	6.42	1.25	3,445.56
General office building	2.97	4.92	36.17	0.03	5.68	1.11	3,049.55
TOTALS (tons/year, mitigated)	19.26	31.46	233.95	0.18	36.06	7.03	19,412.08

Operational Settings:

Does not include correction for passby trips

Does not include double counting adjustment for internal trips

Analysis Year: 2010 Season: Annual

Emfac: Version : Emfac2007 V2.3 Nov 1 2006

10/19/2010 4:59:02 PM

Summary of Land Uses

Land Use Type	Acreage	Trip Rate	Unit Type	No. Units	Total Trips	Total VMT
Single family housing	173.67	10.00	dwelling units	521.00	5,210.00	55,342.71
Condo/townhouse general	14.38	8.00	dwelling units	230.00	1,840.00	19,545.22
Strip mall		42.94	1000 sq ft	62.00	2,662.28	20,086.90
General office building		11.01	1000 sq ft	150.00	1,651.50	17,774.27
					11,363.78	112,749.10

Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	48.9	1.2	98.4	0.4
Light Truck < 3750 lbs	10.9	2.8	91.7	5.5
Light Truck 3751-5750 lbs	21.7	0.9	98.6	0.5
Med Truck 5751-8500 lbs	9.5	1.1	98.9	0.0
Lite-Heavy Truck 8501-10,000 lbs	1.7	0.0	76.5	23.5
Lite-Heavy Truck 10,001-14,000 lbs	0.6	0.0	50.0	50.0
Med-Heavy Truck 14,001-33,000 lbs	1.0	0.0	20.0	80.0
Heavy-Heavy Truck 33,001-60,000 lbs	0.9	0.0	0.0	100.0
Other Bus	0.1	0.0	0.0	100.0
Urban Bus	0.1	0.0	0.0	100.0
Motorcycle	3.5	68.6	31.4	0.0
School Bus	0.1	0.0	0.0	100.0
Motor Home	1.0	0.0	90.0	10.0

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Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	17.1	7.3	7.5	17.1	7.4	7.4
Rural Trip Length (miles)	17.1	7.1	7.9	17.1	6.6	6.6
Trip speeds (mph)	35.0	35.0	35.0	35.0	35.0	35.0
% of Trips - Residential	32.9	18.0	49.1			
% of Trips - Commercial (by land use)						
Strip mall				2.0	1.0	97.0
General office building				35.0	17.5	47.5

URBEMIS Model Run

Accounting for Local Serving Retail

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Urbemis 2007 Version 9.2.4

Combined Annual Emissions Reports (Tons/Year)

File Name: C:\Urbemis\Urbemis 9.2.2\Projects\Campus Park Vehicle GHG Emissions.urb924

Project Name: Campus Park

Project Location: California State-wide

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (tons/year, unmitigated)	19.02	31.04	230.85	0.18	35.59	6.94	19,154.85
TOTALS (tons/year, mitigated)	18.64	30.41	226.17	0.18	34.86	6.80	18,766.79
Percent Reduction	2.00	2.03	2.03	0.00	2.05	2.02	2.03

SUM OF AREA SOURCE AND OPERATIONAL EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (tons/year, unmitigated)	19.02	31.04	230.85	0.18	35.59	6.94	19,154.85

Both Area and Operational Mitigation must be turned on to get a combined mitigated total.

10/19/2010 4:59:32 PM

Operational Unmitigated Detail Report:

OPERATIONAL EMISSION ESTIMATES Annual Tons Per Year, Unmitigated

Source	ROG	NOX	CO	SO2	PM10	PM25	CO2
Single family housing	9.37	15.18	113.80	0.09	17.47	3.41	9,418.44
Condo/townhouse general	3.36	5.36	40.19	0.03	6.17	1.20	3,326.28
Strip mall	3.36	5.64	41.16	0.03	6.34	1.24	3,400.48
General office building	2.93	4.86	35.70	0.03	5.61	1.09	3,009.65
TOTALS (tons/year, unmitigated)	19.02	31.04	230.85	0.18	35.59	6.94	19,154.85

Operational Mitigated Detail Report:

OPERATIONAL EMISSION ESTIMATES Annual Tons Per Year, Mitigated

Source	ROG	NOX	CO	SO2	PM10	PM25	CO2
Single family housing	9.20	14.89	111.62	0.09	17.13	3.34	9,238.17
Condo/townhouse general	3.28	5.23	39.23	0.03	6.02	1.18	3,246.70
Strip mall	3.29	5.53	40.34	0.03	6.21	1.21	3,332.47
General office building	2.87	4.76	34.98	0.03	5.50	1.07	2,949.45
TOTALS (tons/year, mitigated)	18.64	30.41	226.17	0.18	34.86	6.80	18,766.79

Operational Settings:

Does not include correction for passby trips

Does not include double counting adjustment for internal trips

Analysis Year: 2010 Season: Annual

Emfac: Version : Emfac2007 V2.3 Nov 1 2006

10/19/2010 4:59:32 PM

Summary of Land Uses

Land Use Type	Acreage	Trip Rate	Unit Type	No. Units	Total Trips	Total VMT
Single family housing	173.67	10.00	dwelling units	521.00	5,210.00	55,342.71
Condo/townhouse general	14.38	8.00	dwelling units	230.00	1,840.00	19,545.22
Strip mall		42.94	1000 sq ft	62.00	2,662.28	20,086.90
General office building		11.01	1000 sq ft	150.00	1,651.50	17,774.27
					11,363.78	112,749.10

Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	48.9	1.2	98.4	0.4
Light Truck < 3750 lbs	10.9	2.8	91.7	5.5
Light Truck 3751-5750 lbs	21.7	0.9	98.6	0.5
Med Truck 5751-8500 lbs	9.5	1.1	98.9	0.0
Lite-Heavy Truck 8501-10,000 lbs	1.7	0.0	76.5	23.5
Lite-Heavy Truck 10,001-14,000 lbs	0.6	0.0	50.0	50.0
Med-Heavy Truck 14,001-33,000 lbs	1.0	0.0	20.0	80.0
Heavy-Heavy Truck 33,001-60,000 lbs	0.9	0.0	0.0	100.0
Other Bus	0.1	0.0	0.0	100.0
Urban Bus	0.1	0.0	0.0	100.0
Motorcycle	3.5	68.6	31.4	0.0
School Bus	0.1	0.0	0.0	100.0
Motor Home	1.0	0.0	90.0	10.0

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Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	17.1	7.3	7.5	17.1	7.4	7.4
Rural Trip Length (miles)	17.1	7.1	7.9	17.1	6.6	6.6
Trip speeds (mph)	35.0	35.0	35.0	35.0	35.0	35.0
% of Trips - Residential	32.9	18.0	49.1			
% of Trips - Commercial (by land use)						
Strip mall				2.0	1.0	97.0
General office building				35.0	17.5	47.5

URBEMIS Model Run

Accounting for Bike and Pedestrian Access

10/19/2010 4:59:54 PM

Urbemis 2007 Version 9.2.4

Combined Annual Emissions Reports (Tons/Year)

File Name: C:\Urbemis\Urbemis 9.2.2\Projects\Campus Park Vehicle GHG Emissions.urb924

Project Name: Campus Park

Project Location: California State-wide

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (tons/year, unmitigated)	19.02	31.04	230.85	0.18	35.59	6.94	19,154.85
TOTALS (tons/year, mitigated)	17.55	28.53	212.08	0.17	32.70	6.39	17,598.16
Percent Reduction	7.73	8.09	8.13	5.56	8.12	7.93	8.13

SUM OF AREA SOURCE AND OPERATIONAL EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (tons/year, unmitigated)	19.02	31.04	230.85	0.18	35.59	6.94	19,154.85

Both Area and Operational Mitigation must be turned on to get a combined mitigated total.

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Operational Unmitigated Detail Report:

OPERATIONAL EMISSION ESTIMATES Annual Tons Per Year, Unmitigated

Source	ROG	NOX	CO	SO2	PM10	PM25	CO2
Single family housing	9.37	15.18	113.80	0.09	17.47	3.41	9,418.44
Condo/townhouse general	3.36	5.36	40.19	0.03	6.17	1.20	3,326.28
Strip mall	3.36	5.64	41.16	0.03	6.34	1.24	3,400.48
General office building	2.93	4.86	35.70	0.03	5.61	1.09	3,009.65
TOTALS (tons/year, unmitigated)	19.02	31.04	230.85	0.18	35.59	6.94	19,154.85

Operational Mitigated Detail Report:

OPERATIONAL EMISSION ESTIMATES Annual Tons Per Year, Mitigated

Source	ROG	NOX	CO	SO2	PM10	PM25	CO2
Single family housing	8.69	14.02	105.06	0.08	16.13	3.15	8,695.28
Condo/townhouse general	3.06	4.85	36.33	0.03	5.58	1.09	3,007.04
Strip mall	3.09	5.19	37.86	0.03	5.83	1.14	3,127.66
General office building	2.71	4.47	32.83	0.03	5.16	1.01	2,768.18
TOTALS (tons/year, mitigated)	17.55	28.53	212.08	0.17	32.70	6.39	17,598.16

Operational Settings:

Does not include correction for passby trips

Does not include double counting adjustment for internal trips

Analysis Year: 2010 Season: Annual

Emfac: Version : Emfac2007 V2.3 Nov 1 2006

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Summary of Land Uses

Land Use Type	Acreage	Trip Rate	Unit Type	No. Units	Total Trips	Total VMT
Single family housing	173.67	10.00	dwelling units	521.00	5,210.00	55,342.71
Condo/townhouse general	14.38	8.00	dwelling units	230.00	1,840.00	19,545.22
Strip mall		42.94	1000 sq ft	62.00	2,662.28	20,086.90
General office building		11.01	1000 sq ft	150.00	1,651.50	17,774.27
					11,363.78	112,749.10

Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	48.9	1.2	98.4	0.4
Light Truck < 3750 lbs	10.9	2.8	91.7	5.5
Light Truck 3751-5750 lbs	21.7	0.9	98.6	0.5
Med Truck 5751-8500 lbs	9.5	1.1	98.9	0.0
Lite-Heavy Truck 8501-10,000 lbs	1.7	0.0	76.5	23.5
Lite-Heavy Truck 10,001-14,000 lbs	0.6	0.0	50.0	50.0
Med-Heavy Truck 14,001-33,000 lbs	1.0	0.0	20.0	80.0
Heavy-Heavy Truck 33,001-60,000 lbs	0.9	0.0	0.0	100.0
Other Bus	0.1	0.0	0.0	100.0
Urban Bus	0.1	0.0	0.0	100.0
Motorcycle	3.5	68.6	31.4	0.0
School Bus	0.1	0.0	0.0	100.0
Motor Home	1.0	0.0	90.0	10.0

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Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	17.1	7.3	7.5	17.1	7.4	7.4
Rural Trip Length (miles)	17.1	7.1	7.9	17.1	6.6	6.6
Trip speeds (mph)	35.0	35.0	35.0	35.0	35.0	35.0
% of Trips - Residential	32.9	18.0	49.1			
% of Trips - Commercial (by land use)						
Strip mall				2.0	1.0	97.0
General office building				35.0	17.5	47.5

AIR QUALITY TECHNICAL REPORT

Air Quality Technical Report

for the

Campus Park (Passerelle) Specific Plan

GPA 03-04,
SP 03-008,
R 03-014,
TM 5338RPL,
ER 03-02-059

Submitted To:

Passerelle, LLC
402 W. Broadway, Suite 1320
San Diego, CA 92101

Prepared By:

Scientific Resources Associated
1328 Kaimalino Lane
San Diego, CA 92109

March 11, 2009

Table of Contents

Glossary of Terms and Acronyms

APCD	Air Pollution Control District
AQIA	Air Quality Impact Assessment
AQMD	Air Quality Management District
AQMP	Air Quality Management Plan
ARB	California Air Resources Board
BACM	Best Available Control Measure
BACT	Best Available Control Technology
BMPs	Best Management Practices
CAA	Clean Air Act (Federal)
CAAQS	California Ambient Air Quality Standard
CALINE4	California Line Source Dispersion Model (Version 4)
Caltrans	California Department of Transportation
CCAA	California Clean Air Act
CO	Carbon Monoxide
DPLU	San Diego County Department of Planning and Land Use
EPA	United States Environmental Protection Agency
H_2S	Hydrogen Sulfide
HARP	HotSpots Analysis and Reporting Program
HI	Hazard Index
ISCST	Industrial Source Complex Short Term Model
mg/m^3	Milligrams per Cubic Meter
$\mu g/m^3$	Micrograms per Cubic Meter
NAAQS	National Ambient Air Quality Standard
NOx	Oxides of Nitrogen
NO_2	Nitrogen Dioxide
O_3	Ozone
$PM_{2.5}$	Fine Particulate Matter (particulate matter with an aerodynamic diameter of 2.5 microns or less
PM_{10}	Respirable Particulate Matter (particulate matter with an aerodynamic diameter of 10 microns or less
ppm	Parts per million
PSD	Prevention of Significant Deterioration
RAQS	San Diego County Regional Air Quality Strategy
ROCs	Reactive Organic Compounds
ROG	Reactive Organic Gases
SANDAG	San Diego Association of Governments
SCAQMD	South Coast Air Quality Management District
SCAB	South Coast Air Basin
SDAB	San Diego Air Basin
SDAPCD	San Diego County Air Pollution Control District
SIP	State Implementation Plan
SOx	Oxides of Sulfur
SO_2	Sulfur Dioxide

TACs	Toxic Air Contaminants
T-BACT	Toxics Best Available Control Technology
VOCs	Volatile Organic Compounds

Executive Summary

This report presents an assessment of potential air quality impacts associated with the proposed Campus Park Specific Plan Project. The evaluation addresses the potential for air emissions during construction and after full buildout of the project, including an assessment of the potential for CO "hot spots" to form due to traffic associated with the proposed project.

The proposed project would result in emissions of air pollutants for both the construction phase and operational phase of the project. Construction emissions would include emissions associated with fugitive dust, heavy construction equipment and construction workers commuting to and from the site. During the grading phase, the emissions associated with construction would be more than the significance criteria for the maximum construction scenario for NOx and PM_{10}, and would therefore pose a significant, but temporary, impact on the ambient air quality during construction.

The main operational impacts associated with the Project would include impacts associated with traffic; impacts associated with area sources such as energy use, landscaping, and the use of fireplaces at the residences. Emissions of CO and VOCs would exceed the screening-level thresholds for project operations. Because traffic impacts would be mitigated to below a level of significance, no exceedances of the CO standard would occur and the project would not result in a significant impact for CO. Also, because the project would not exceed the growth projections in the SANDAG growth forecasts for the Fallbrook Subregional Area as discussed in Section 4.1.2, the project would not result in an exceedance of the ozone standard and impacts associated with project operations would therefore be less than significant.

A health risk assessment was conducted to evaluate the potential for project construction or operations to result in a significant impact to nearby sensitive receptors. The risk assessment focused on diesel particulate matter, which is the main TAC emitted from vehicles. The risk assessment concluded that risks were less than significant.

An evaluation of odors indicated that odor impacts would be less than significant.

1.0 INTRODUCTION

1.1 Purpose of the Report

This report presents an assessment of potential air quality impacts associated with the proposed Campus Park Specific Plan. The evaluation addresses the potential for air emissions during construction and after full buildout of the project, including an assessment of the potential for CO "hot spots" to form due to traffic associated with the proposed project.

1.2 Project Location and Description

The Project proposes on-site construction of a mixed-use community. The development would include a total of 1,076 single- and multi-family homes, commercial uses, and professional office uses, as well as parks, a Homeowner's Association (HOA) recreational facility, a Town Center (with retail and support services), and designated open space and biological open space preserves. The infrastructure necessary to support the development would include on- and off-site roadways, sewer and water facilities, and storm drains, as well as support for non-vehicular modes of transportation via bikeways and pedestrian paths.

The Proposed Project would include 521 single-family dwelling units and 555 multi-family dwelling units. Single-family residential units would be located in the northern portion of the site, and multi-family housing would be located in the central southeastern areas, on either side of Horse Ranch Creek Road, as well as abutting SR 76. Professional office buildings, an active sports complex, and a Town Center would be aligned (north to south) along the western edge of the northern portion of the Project site, bordered on the west by Horse Ranch Creek Road. Preserved coastal sage scrub habitat would abut most of the northern portion of the Proposed Project to the west, north, and east. The southern portion of the Project would include mostly preserved riparian habitat.

The Town Center would be constructed in the central portion of the Project site on the east side of Horse Ranch Creek Road. A total building square footage of 61,200 would be allowed in the planning area. The Town Center would include numerous structures, as well as a parking area.

Community-serving uses in Campus Park would be concentrated in the Town Center core area, which would function as the social, commercial and activity center for the community. The Town Center would include a variety of social, civic and commercial uses within the Proposed Project, such as community-serving commercial retail shops and services, restaurants, offices, a post office, sheriff substation and library. Structures would not exceed two stories.

Four office professional lots are proposed for the development and would be located on the east side on Horse Ranch Creek Road on either side of Baltimore Oriole Road. In addition to administrative and professional services, office uses could include financial and real estate services, medical offices, schools, civic uses, day care and eating establishments. A total building square footage of approximately 157,000 would be allowed on these lots. Office professional uses would not exceed two stories.

The Proposed Project would include two wastewater management design options, only one of which would be implemented. Under both options, sewage would be collected from the Project site via 10- and 15- inch diameter pipelines beneath roadways. The sewage would flow to the southern portion of the site to a proposed sewer lift station to be located on the west side of Pala Mesa Drive east of the proposed trail staging area. Sewage would then be carried off-site through an existing 12-inch diameter force main.

Under Wastewater Management Option 1, all Project sewage would flow from the force main to infrastructure owned and operated by Rainbow Municipal Water District. Under Wastewater Management Option 2, sewage from 850 Equivalent Dwelling Units (EDUs) would be sent to Rainbow Municipal Water District for Treatment, with the remainder to be treated at a new wastewater treatment plant (WTP) to be built by others and to be located within the service area of Valley Center Municipal Water District. An inter-district agreement would be required between the two water districts. Under Option 2, a storage pond adequate to contain 84 days of wet-weather storage (to store treated effluent during days when irrigation would result in runoff) would be constructed within the south-eastern portion of the Project site. Reclaimed water pipelines would be constructed from the off-site WTP, within Horse Ranch Creek Road, and

would cross a small portion of the western-most portion of the proposed abutting Meadowood Project in order to reach the containment basin.

Existing vegetation on site would be retained within dedicated biological open space preserves. Coastal sage scrub-covered slopes would be preserved in the north, northwestern and northeastern portions of the site, while riparian areas would be preserved along the southwestern boundary of the property. Additional acreage (fuel management zones and interior landscaped slopes) would be designated as open space for HOA maintenance, otherwise known as common open space. In addition, six neighborhood parks and an HOA recreation/community facility—including a pool and a small picnic area/barbecue—would serve local residents. An 8.6-acre active sports park would be located along Horse Ranch Creek Road. The park would include two baseball fields—one overlapping with a soccer/multi-purpose field—a restroom/maintenance building and parking.

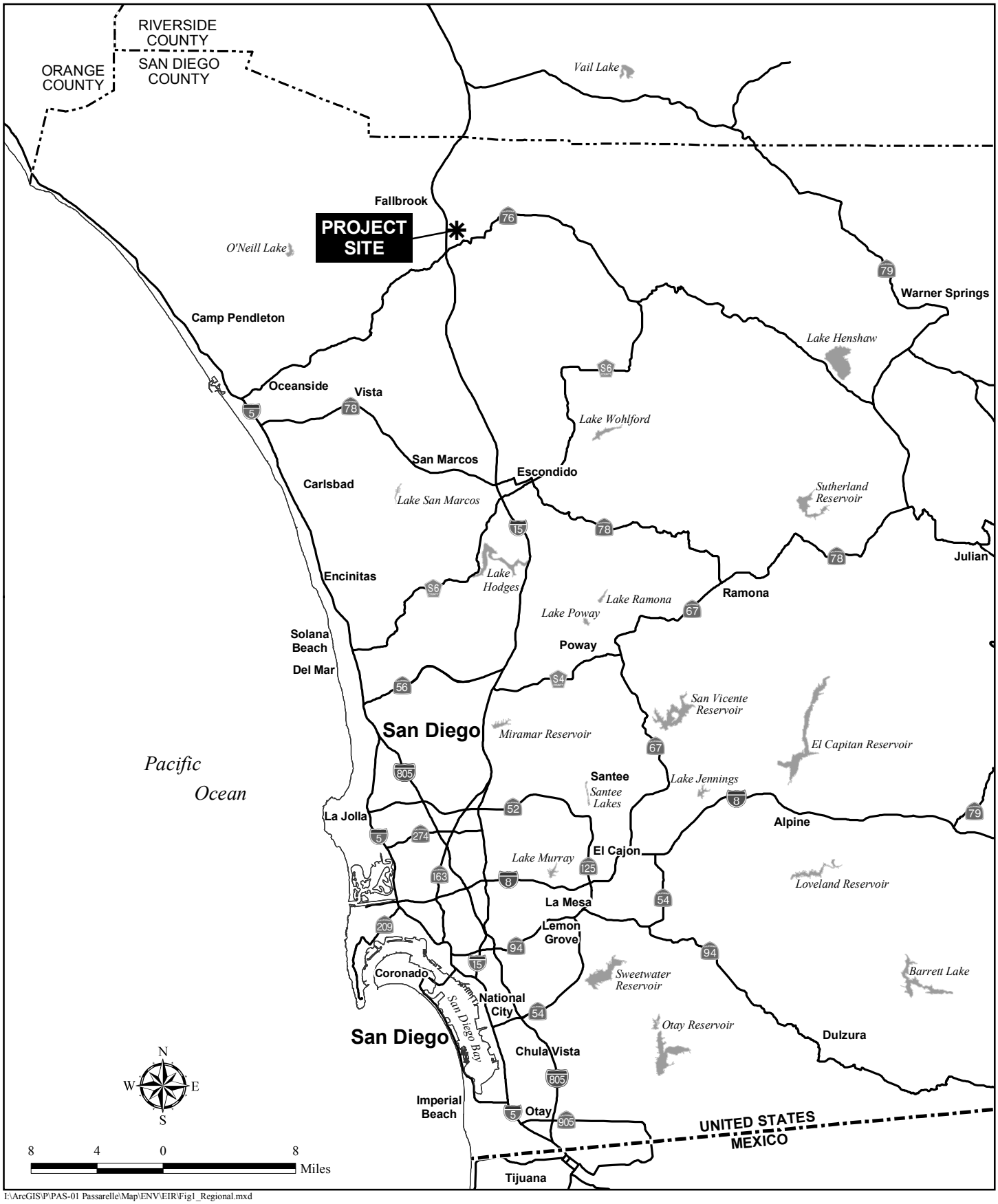
A trail system consisting of community trails and nature trails would be provided throughout the Project site. Community trails, to be constructed within the development footprint, would allow pedestrians to connect to the various open space and park areas on the Project site. Nature trails would be provided in the northern area. The trails would be eight feet wide with a soft surface and adjacent rail fence, where needed for safety. The trails would extend around the perimeter of the northern area, connecting to the off-site Monserate Mountain trail to the north and east. The Monserate Mountain hiking trail, located within the Fallbrook Conservancy Preserve, currently extends from the existing Pankey Road (north extension) through the undeveloped area north of the Project site to the east side of the Project site. This trail would connect on either end to the community trail system. The majority of trails would occur in already existing trails or dirt roads.

Several new roadways would be constructed to provide access to the Project's neighborhoods. Horse Ranch Creek Road would provide the primary entrance to the Project site and access to the majority of the development. This road would extend north from SR 76, ultimately connecting with the existing northern portion of Pankey Road. Secondary street access would be provided from the south via Pala Mesa Drive, which would extend northwest from Pankey Place, and

ultimately connect to Old Highway 395 west of I-15 via an existing, currently unused bridge. Other roads would serve the residential areas. All roads would have sidewalks (composed of either concrete or decomposed granite), landscape easements and lighting. Some roads would include on-street parking; additional off-street parking lots would be provided within the professional office, Town Center, multi-family residential and park areas.

The Project would maintain a 200-foot vegetation management zone north and east of single-family residences in the northern and central portions of the site for fuel management and fire protection. A 125-foot-wide vegetation management zone would be maintained on the west side of single-family residences in the northern area and southeastern side of the single-family residences in the southern area. Excluding portions abutting Meadowood (if approved), a 125-foot-wide vegetation management zone also would be maintained along the southeastern side of PA MF-3, and along the eastern edge of PAs MF-2 and MF-4. A 100- to 125-foot-wide vegetation management zone would be required for the balance of the Project site, including any lots bordering natural open space areas, flammable vegetation, and parks without an internal defensible zone. Required 30-foot clearing along roadways would fall within proposed fuel modification zones. A 10-foot clearance would occur along either side of on-site trails within open space.

Figure 1-1 provides a location map of the project, and Figure 1-2 provides an areal photograph of the project site.



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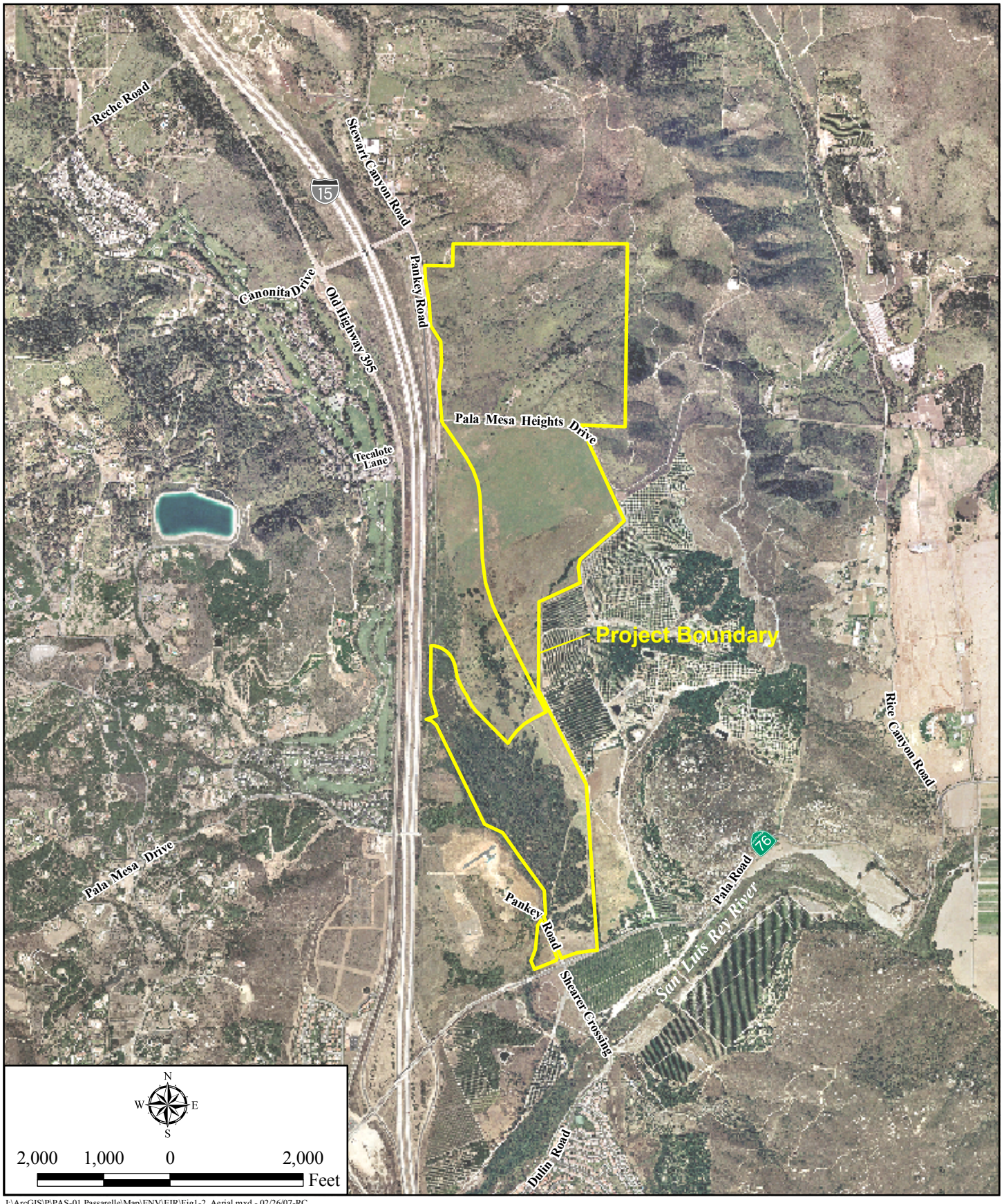
Regional Location Map

CAMPUS PARK PROJECT

HELIX

Figure 1-1



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Aerial Photograph

CAMPUS PARK PROJECT

HELIX

Figure 1-2

The project would be constructed using best management practices to reduce the amount of fugitive dust generated from construction of the proposed project, and their respective control efficiencies. These dust control measures that will be included in the project include the following:

- Multiple applications of water during grading between dozer/scraper passes
- Paving, chip sealing or chemical stabilization of internal roadways after completion of grading
- Use of sweepers or water trucks to remove "track-out" at any point of public street access
- Termination of grading if winds exceed 25 mph
- Stabilization of dirt storage piles by chemical binders, tarps, fencing or other erosion control
- Hydroseeding of graded residential lots

This Air Quality Technical Report includes an evaluation of existing conditions in the project vicinity, an assessment of potential impacts associated with project construction, and an evaluation of project operational impacts.

2.0 EXISTING CONDITIONS

2.1 Existing Setting

The project site is located in northern San Diego County in the community of Fallbrook, approximately 46 miles northwest of downtown San Diego, north of the cities of Escondido and San Marcos and south of the City of Temecula in Riverside County. The San Luis Rey River runs south of the project site, Interstate 15 borders a portion of the site to the west. Surrounding lands to the north, east and southwest are currently undeveloped or planned to be developed.

2.2 Climate and Meteorology

The project site is located in the San Diego Air Basin (SDAB). The climate of the SDAB is dominated by a semi-permanent high pressure cell located over the Pacific Ocean. This cell influences the direction of prevailing winds (westerly to northwesterly) and maintains clear skies for much of the year. Figure 2 provides a graphic representation of the prevailing winds in the project vicinity, as measured at the San Diego Air Pollution Control District's (APCD's) Escondido Monitoring Station (the closest meteorological monitoring station to the site). The

high pressure cell also creates two types of temperature inversions that may act to degrade local air quality.

Subsidence inversions occur during the warmer months as descending air associated with the Pacific high pressure cell comes into contact with cool marine air. The boundary between the two layers of air creates a temperature inversion that traps pollutants. The other type of inversion, a radiation inversion, develops on winter nights when air near the ground cools by heat radiation and air aloft remains warm. The shallow inversion layer formed between these two air masses also can trap pollutants. As the pollutants become more concentrated in the atmosphere, photochemical reactions occur that produce ozone, commonly known as smog.

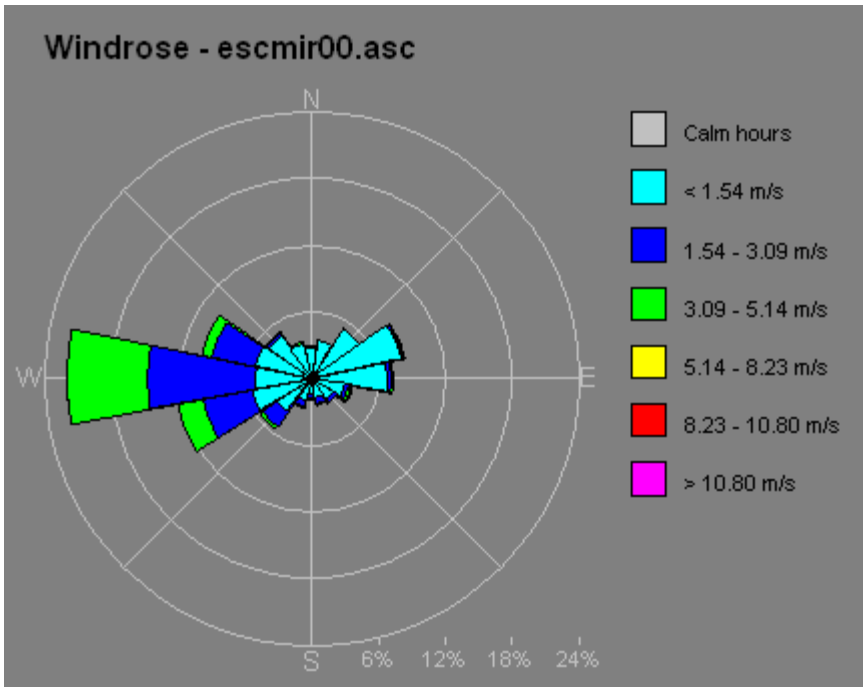

Figure 2. Wind Rose – Escondido Monitoring Station

2.3 Regulatory Setting

Air quality is defined by ambient air concentrations of specific pollutants identified by the United States Environmental Protection Agency (USEPA) to be of concern with respect to health and welfare of the general public. The USEPA is responsible for enforcing the Federal Clean

Air Act (CAA) of 1970 and its 1977 and 1990 Amendments. The CAA required the USEPA to establish National Ambient Air Quality Standards (NAAQS), which identify concentrations of pollutants in the ambient air below which no adverse effects on the public health and welfare are anticipated. In response, the USEPA established both primary and secondary standards for several pollutants (called "criteria" pollutants). Primary standards are designed to protect human health with an adequate margin of safety. Secondary standards are designed to protect property and the public welfare from air pollutants in the atmosphere.

In September 1997, the EPA promulgated 8-hour O_3 and 24-hour and annual $PM_{2.5}$ national standards (particulate matter less than 2.5 microns in diameter). However, due to a lawsuit in May 1999, the United States District Court rescinded these standards and the EPA's authority to enforce them. Subsequent to an appeal of this decision by the EPA, the United States Supreme Court in February 2001 upheld these standards. As a result, this action has initiated a new planning process to monitor and evaluate emission control measures for these pollutants. The EPA is moving forward to develop policies to implement these standards.

The CAA allows states to adopt ambient air quality standards and other regulations provided they are at least as stringent as federal standards. The California Air Resources Board (ARB) has established the more stringent California Ambient Air Quality Standards (CAAQS) for the six criteria pollutants through the California Clean Air Act of 1988, and also has established CAAQS for additional pollutants, including sulfates, hydrogen sulfide, vinyl chloride and visibility-reducing particles. Areas that do not meet the NAAQS or the CAAQS for a particular pollutant are considered to be "nonattainment areas" for that pollutant. In December 2002, the APCD submitted a maintenance plan for the 1-hour NAAQS for O_3 and requested redesignation from a serious O_3 nonattainment area to attainment. As of July 28, 2003, the San Diego Air Basin has been reclassified as an attainment area for the 1-hour NAAQS for O_3. On April 15, 2004, the SDAB was designated a basic nonattainment area for the 8-hour NAAQS for O_3. The SDAB is in attainment for the NAAQS for all other criteria pollutants. The SDAB is currently classified as a nonattainment area under the CAAQS for O_3 and PM_{10}.

The ARB is the state regulatory agency with authority to enforce regulations to both achieve and maintain the NAAQS and CAAQS. The ARB is responsible for the development, adoption, and

enforcement of the state's motor vehicle emissions program, as well as the adoption of the CAAQS. The ARB also reviews operations and programs of the local air districts, and requires each air district with jurisdiction over a nonattainment area to develop its own strategy for achieving the NAAQS and CAAQS. The local air district has the primary responsibility for the development and implementation of rules and regulations designed to attain the NAAQS and CAAQS, as well as the permitting of new or modified sources, development of air quality management plans, and adoption and enforcement of air pollution regulations. The APCD is the local agency responsible for the administration and enforcement of air quality regulations for San Diego County.

The APCD and the San Diego Association of Governments (SANDAG) are responsible for developing and implementing the clean air plan for attainment and maintenance of the ambient air quality standards in the SDAB. The San Diego County Regional Air Quality Strategy (RAQS) was initially adopted in 1991, and is updated on a triennial basis. The RAQS was updated in 1995, 1998, 2001, and most recently in 2004. The RAQS outlines APCD's plans and control measures designed to attain the state air quality standards for O_3. The APCD has also developed the air basin's input to the SIP, which is required under the Federal Clean Air Act for areas that are out of attainment of air quality standards. The SIP includes the APCD's plans and control measures for attaining the O_3 NAAQS. The SIP is also updated on a triennial basis. The latest SIP update was submitted by the ARB to the EPA in 1998. The attainment schedule in the SIP called for the SDAB to attain the NAAQS for O_3 by 1999. The San Diego APCD has determined that the SDAB has achieved its O_3 attainment goal, and has applied to the EPA for redesignation as an O_3 attainment area. As of July 28, 2003, the SDAB has been redesignated as an O_3 attainment area for the one-hour NAAQS for ozone; however, as discussed below, the SDAB has been designated as a basic nonattainment area for the new 8-hour NAAQS for ozone.

The RAQS relies on information from ARB and SANDAG, including mobile and area source emissions, as well as information regarding projected growth in the County, to project future emissions and then determine from that the strategies necessary for the reduction of emissions through regulatory controls. The ARB mobile source emission projections and SANDAG growth projections are based on population and vehicle trends and land use plans developed by

the cities and by the County as part of the development of the County's General Plan. As such, projects that propose development that is consistent with the growth anticipated by the general plans would be consistent with the RAQS. In the event that a project would propose development which is less dense than anticipated within the general plan, the project would likewise be consistent with the RAQS. If a project proposes development that is greater than that anticipated in the general plan and SANDAG's growth projections, the project might be in conflict with the RAQS and SIP, and might have a potentially significant impact on air quality.

The SIP relies on the same information from SANDAG to develop emission inventories and emission reduction strategies that are included in the attainment demonstration for the air basin. The SIP also includes rules and regulations that have been adopted by the APCD to control emissions from stationary sources. These SIP-approved rules may be used as a guideline to determine whether a project's emissions would have the potential to conflict with the SIP and thereby hinder attainment of the NAAQS for O_3.

Table 1 presents a summary of the ambient air quality standards adopted by the federal and California Clean Air Acts.

Table 1
AMBIENT AIR QUALITY STANDARDS

POLLUTANT	AVERAGE TIME	CALIFORNIA STANDARDS		NATIONAL STANDARDS		
		Concentration	Measurement Method	Primary	Secondary	Measurement Method
Ozone (O_3)	1 hour	0.09 ppm (180 $\mu g/m^3$)	Ultraviolet Photometry	--	--	Ethylene Chemiluminescence
	8 hour	0.070 ppm (137 $\mu g/m^3$)		0.075 ppm (147 $\mu g/m^3$)	0.075 ppm (147 $\mu g/m^3$)	
Carbon Monoxide (CO)	8 hours	9.0 ppm (10 mg/m^3)	Non-Dispersive Infrared Spectroscopy (NDIR)	9 ppm (10 mg/m^3)	None	Non-Dispersive Infrared Spectroscopy (NDIR)
	1 hour	20 ppm (23 mg/m^3)		35 ppm (40 mg/m^3)		
Nitrogen Dioxide (NO_2)	Annual Average	0.030 ppm (56 $\mu g/m^3$)	Gas Phase Chemiluminescence	0.053 ppm (100 $\mu g/m^3$)	0.053 ppm (100 $\mu g/m^3$)	Gas Phase Chemiluminescence
	1 hour	0.18 ppm (338 $\mu g/m^3$)		--	--	
Sulfur Dioxide (SO_2)	Annual Average	--	Ultraviolet Fluorescence	0.03 ppm (80 $\mu g/m^3$)	--	Pararosaniline
	24 hours	0.04 ppm (105 $\mu g/m^3$)		0.14 ppm (365 $\mu g/m^3$)	--	
	3 hours	--		--	0.5 ppm (1300 $\mu g/m^3$)	
	1 hour	0.25 ppm (655 $\mu g/m^3$)		--	--	
Respirable Particulate Matter (PM_{10})	24 hours	50 $\mu g/m^3$	Gravimetric or Beta Attenuation	150 $\mu g/m^3$	150 $\mu g/m^3$	Inertial Separation and Gravimetric Analysis
	Annual Arithmetic Mean	20 $\mu g/m^3$		--	--	
Fine Particulate Matter ($PM_{2.5}$)	Annual Arithmetic Mean	12 $\mu g/m^3$	Gravimetric or Beta Attenuation	15 $\mu g/m^3$	15 $\mu g/m^3$	Inertial Separation and Gravimetric Analysis
	24 hours	--		35 $\mu g/m^3$	35 $\mu g/m^3$	
Sulfates	24 hours	25 $\mu g/m^3$	Ion Chromatography	--	--	--
Lead (Pb)	30-day Average	1.5 $\mu g/m^3$	Atomic Absorption	--	--	Atomic Absorption
	Rolling 3-month Average	--		0.15 $\mu g/m^3$	0.15 $\mu g/m^3$	
Hydrogen Sulfide (H_2S)	1 hour	0.03 ppm (42 $\mu g/m^3$)	Ultraviolet Fluorescence	--	--	--
Vinyl Chloride	24 hours	0.010 ppm (26 $\mu g/m^3$)	Gas Chromatography	--	--	--

ppm= parts per million;$\mu g/m^3$ = micrograms per cubic meter ;mg/m^3= milligrams per cubic meter
Source: California Air Resources Board 2008

2.4 Background Air Quality

The APCD operates a network of ambient air monitoring stations throughout San Diego County. The purpose of the monitoring stations is to measure ambient concentrations of the pollutants and determine whether the ambient air quality meets the CAAQS and the NAAQS. The nearest ambient monitoring stations to the project site are the Escondido East Valley Parkway station, and the San Diego 12th Avenue station (which is the closest station that measures SO_2). Because both the Escondido and San Diego 12th Avenue monitoring stations are located in areas where there is substantial traffic congestion, it is likely that pollutant concentrations measured at those monitoring stations are higher than concentrations that would be observed or measured in the Project area, and would thus provide a conservative estimate of background ambient air quality. Ambient concentrations of pollutants over the last three years are presented in Table 2.

Air quality has shown improvement in the San Diego Air Basin such that the 1-hour federal ozone standard has not been exceeded at the Escondido monitoring station during the period from 2004 through 2006. The federal 8-hour ozone standard, which was formally adopted in 2001 after legal arguments with the EPA, was exceeded at the Escondido monitoring station twice in 2004 and twice in 2006. The federal 24-hour $PM_{2.5}$ standard was exceeded once in 2004. The Escondido monitoring station measured exceedances of the state PM_{10} and $PM_{2.5}$ standards during the period from 2004 to 2006. The data from the monitoring stations indicate that air quality is in attainment of all other federal standards.

Concentrations of CO at the Escondido monitoring station tend to be among the highest in the San Diego Air Basin, due to the fact that the monitor is located along East Valley Parkway in a congested area in downtown Escondido. The station sees higher concentrations of CO than have historically been measured elsewhere in San Diego County and the background data are not likely to be representative of background ambient CO concentrations at the Project site, due to the site's location in a less developed area. Since 2000, CO has not been monitored at other stations in northern San Diego County.

Table 2
Ambient Background Concentrations
(ppm unless otherwise indicated)

Pollutant	Averaging Time	2004	2005	2006	Most Stringent Ambient Air Quality Standard	Monitoring Station
Ozone	8 hour	0.086	0.079	0.096	0.08	Escondido
	1 hour	0.099	0.095	0.108	0.09	Escondido
PM_{10}	Annual	27.5 µg/m^3	23.9 µg/m^3	24.1 µg/m^3	20 µg/m^3	Escondido
	24 hour	57 µg/m^3	42 µg/m^3	51 µg/m^3	50 µg/m^3	Escondido
$PM_{2.5}$	Annual	13.5 µg/m^3	12.3 µg/m^3	11.5 µg/m^3	12 µg/m^3	Escondido
	24 hour	67.3 µg/m^3	43.1 µg/m^3	40.6 µg/m^3	35 µg/m^3	Escondido
NO_2	Annual	0.018	0.016	0.017	0.030	Escondido
	1 hour	0.080	0.076	0.071	0.17	Escondido
CO	8 hour	3.81	3.10	3.61	9.0	Escondido
	1 hour	6.3	5.9	5.7	20	Escondido
SO_2	Annual	0.003	0.002	0.004	0.03	San Diego
	24 hour	0.015	0.007	0.009	0.04	San Diego
	3 hour	0.021	0.019	0.030	0.5[1]	San Diego
	1 hour	0.042	0.040	0.034	0.25	San Diego

[1]Secondary NAAQS

Source: www.arb.ca.gov/aqd/aqd.htm (Measurements of all pollutants at Escondido-E Valley Parkway station, except SO_2,) www.epa.gov/air/data/monvals.html (1-hour and 3-hour SO_2 and 1-hour CO; 2004 annual measurements)

3.0 SIGNIFICANCE CRITERIA AND ANALYSIS METHODOLOGIES

The County of San Diego (County of San Diego 2007) has approved guidelines for determining significance based on Appendix G.III of the State CEQA Guidelines, which provides guidance that a project would have a significant environmental impact if it would:

1. Conflict or obstruct the implementation of the San Diego Regional Air Quality Strategy (RAQS) or applicable portions of the State Implementation Plan (SIP);
2. Result in emissions that would violate any air quality standard or contribute substantially to an existing or projected air quality violation;

3. Result in a cumulatively considerable net increase of PM_{10} or exceed quantitative thresholds for O_3 precursors, oxides of nitrogen (NO_X) and volatile organic compounds (VOCs);
4. Expose sensitive receptors (including, but not limited to, schools, hospitals, resident care facilities, or day-care centers) to substantial pollutant concentrations; or
5. Create objectionable odors affecting a substantial number of people.

The County of San Diego recognizes the San Diego Air Pollution Control District's established screening level thresholds for air quality emissions (Rules 20.1 et seq.) as screening-level thresholds for land development projects. As stated above, projects that propose development that is consistent with the growth anticipated by the general plans and SANDAG's growth forecasts would be consistent with the RAQS and SIP. Also, projects that are consistent with the SIP rules (i.e., the federally-approved rules and regulations adopted by the APCD) are consistent with the SIP. Thus projects would be required to conform with measures adopted in the RAQS (including use of low-VOC architectural coatings, use of low-NO_x water heaters, and compliance with rules and regulations governing stationary sources) and would also be required to comply with all applicable rules and regulations adopted by the APCD.

To determine whether a project would (a) result in emissions that would violate any air quality standard or contribute substantially to an existing or projected air quality violation; or (b) result in a cumulatively considerable net increase of PM_{10} or exceed quantitative thresholds for O_3 precursors, oxides of nitrogen (NO_X) and volatile organic compounds (VOCs), project emissions may be evaluated based on the quantitative emission thresholds established by the San Diego APCD. As part of its air quality permitting process, the APCD has established thresholds in Rule 20.2 for the preparation of Air Quality Impact Assessments (AQIA). The County of San Diego has also adopted the SCAQMD's screening threshold of 55 pounds per day or 10 tons per year as a significance threshold for $PM_{2.5}$.

For CEQA purposes, these screening criteria can be used as numeric methods to demonstrate that a project's total emissions would not result in a significant impact to air quality. The screening thresholds are included in the table below.

Table 3
Screening-Level Thresholds for Air Quality Impact Analysis

Pollutant	Total Emissions		
Construction Emissions			
	Lb. per Day		
Respirable Particulate Matter (PM_{10})	100		
Fine Particulate Matter ($PM_{2.5}$)	55		
Oxides of Nitrogen (NOx)	250		
Oxides of Sulfur (SOx)	250		
Carbon Monoxide (CO)	550		
Volatile Organic Compounds (VOCs)[1]	75		
Operational Emissions			
	Lb. Per Hour	Lb. per Day	Tons per Year
Respirable Particulate Matter (PM_{10})	---	100	15
Fine Particulate Matter ($PM_{2.5}$)	---	55	10
Oxides of Nitrogen (NOx)	25	250	40
Oxides of Sulfur (SOx)	25	250	40
Carbon Monoxide (CO)	100	550	100
Lead and Lead Compounds	---	3.2	0.6
Volatile Organic Compounds (VOC)	---	75	13.7
Toxic Air Contaminant Emissions			
Excess Cancer Risk	1 in 1 million		
Non-Cancer Hazard	1.0		

In the event that emissions exceed these screening-level thresholds, modeling would be required to demonstrate that the project's total air quality impacts result in ground-level concentrations that are below the State and Federal Ambient Air Quality Standards, including appropriate background levels. For nonattainment pollutants (ozone, with ozone precursors NOx and VOCs, $PM_{2.5}$ and PM_{10}), if emissions exceed the thresholds shown in Table 3, the project could have the

potential to result in a cumulatively considerable net increase in these pollutants and thus could have a significant impact on the ambient air quality.

In addition to impacts from criteria pollutants, project impacts may include emissions of pollutants identified by the state and federal government as toxic air contaminants (TACs) or Hazardous Air Pollutants (HAPs). In San Diego County, the County Department of Planning and Land Use identifies an excess cancer risk level of 1 in 1 million or less for projects that do not implement Toxics Best Available Control Technology (T-BACT), and an excess cancer risk level of 10 in 1 million or less for projects that do implement T-BACT. The significance threshold for non-cancer health effects is a health hazard index of one or less. These significance thresholds are consistent with the San Diego Air Pollution Control District's Rule 1210 requirements for stationary sources. If a project has the potential to result in emissions of any TAC or HAP which result in a cancer risk of greater than 1 in 1 million without T-BACT, 10 in 1 million with T-BACT, or health hazard index of one or more, the project would be deemed to have a potentially significant impact.

With regard to evaluating whether a project would have a significant impact on sensitive receptors, air quality regulators typically define sensitive receptors as schools (Preschool-12th Grade), hospitals, resident care facilities, or day-care centers, or other facilities that may house individuals with health conditions that would be adversely impacted by changes in air quality. Any project which has the potential to directly impact a sensitive receptor located within 1 mile and results in a health risk greater than the risk significance thresholds discussed above would be deemed to have a potentially significant impact.

Section 6318 of the San Diego County Zoning Ordinance requires all commercial and industrial uses "be operated as not to emit matter causing unpleasant odors which is perceptible by the average person at or beyond any lot line of the lot containing said uses." APCD Rule 51 (Public Nuisance) also prohibits emission of any material which causes nuisance to a considerable number of persons or endangers the comfort, health or safety of any person. A project that proposes a use which would produce objectionable odors would be deemed to have a significant odor impact if it would affect a considerable number of offsite receptors.

The impacts associated with construction and operation of the project were evaluated for significance based on these significance criteria.

4.0 PROJECT IMPACT ANALYSIS

The proposed Campus Park Specific Plan includes both construction and operational impacts. Construction impacts include emissions associated with the construction of the project. Operational impacts include emissions associated with the project, including traffic, at full buildout.

4.1 Conformance to the Regional Air Quality Strategy

4.1.1 Guidelines for the Determination of Significance

The RAQS outlines APCD's plans and control measures designed to attain the State air quality standards for ozone. In addition, the APCD relies on the SIP, which includes the APCD's plans and control measures for attaining the ozone NAAQS. These plans accommodate emissions from all sources, including natural sources, through implementation of control measures, where feasible, on stationary sources to attain the standards. Mobile sources are regulated by the EPA and the ARB, and the emissions and reduction strategies related to mobile sources are considered in the RAQS and SIP.

The RAQS relies on information from ARB and SANDAG, including projected growth in the County, mobile, area and all other source emissions in order to project future emissions an ddetermine from that the strategies necessary for the reduction of stationary source emissions through regulatory controls. The ARB mobile source emission projections and SANDAG growth projections are based on population and vehicle trends and land use plans developed by the cities and by the County. As such, projects that propose development that is consistent with the growth anticipated by the general plans would be consistent with the RAQS. In the event that a project would proposed development which is less dense than anticipated within the general plan, the project would likewise be consistent with the RAQS. If a project proposes

development that is greater than that anticipated in the County of San Diego General Plan and SANDAG's growth projections, the project would be in conflict with the RAQS and SIP, and might have a potentially significant impact on air quality. This situation would warrant further analysis to determine if the proposed project and the surrounding projects exceed the growth projections used in the RAQS for the specific subregional area.

4.1.2 Significance of Impacts Prior to Mitigation

The Campus Park Project involves a Specific Plan Amendment and a General Plan Amendment and is proposing more intense development than accounted for in the current General Plan and therefore in the SIP. The Campus Park Project is located in the North County East Major Statistical Area, in the Fallbrook Subregional Area. The total cumulative housing projected for the Fallbrook Subregional Area for 2030, according to SANDAG projections, is an additional 9,630 dwelling units. The project's projected growth of 1,076 dwelling units, when added to the cumulative housing units projected for the Fallbrook Subregional Area (based on the cumulative projects identified in the Campus Park Traffic Impact Study (LOS Engineering 2008), totals 3,887 dwelling units, which is below SANDAG's 2030 projected growth for the North County East Major Statistical Area of 54,251 dwelling units, and less than SANDAG's 2030 projected growth of 9,630 dwelling units for the Fallbrook Subregional Area. Thus the growth projected for the Campus Park Project plus cumulative projects would not result in a cumulatively significant impact and the project would be consistent with the RAQS and SIP.

4.1.3 Mitigation Measures and Design Considerations

Because the Campus Park Project's growth, when added to the projected growth in the Fallbrook Subregional Area would not exceed the growth projections included by SANDAG in the RAQS and SIP, no mitigation measures are required.

4.1.4 Conclusions

The Campus Park Project would conform with the RAQS and SIP and would not result in a significant impact.

4.2 Conformance to Federal and State Ambient Air Quality Standards

4.2.1 Construction Impacts

4.2.1.1 Guidelines for the Determination of Significance

Based on the County of San Diego Guidelines (County of San Diego 2007), construction impacts would be potentially significant if they exceed the quantitative screening-level thresholds for attainment pollutants (NO_2, SO_2, and CO), and would result in a significant impact if they exceed the screening-level thresholds for nonattainment pollutants (ozone precursors and particulate matter).

4.2.1.2 Significance of Impacts Prior to Mitigation

The Campus Park Project would be graded in two main phases: Phase I would involve the central and southern portions of the site, and Phase II would involve the northern portion of the site. Building construction would be completed from 2010 through 2013, with ten sub-phases. Product phasing dates are subject to change depending on market conditions.

Emissions of pollutants such as fugitive dust and heavy equipment exhaust that are generated during construction are generally highest near the construction site. Emissions from the construction phase of the project were estimated through the methodologies recommended in the South Coast Air Quality Management District's CEQA Air Quality Handbook (SCAQMD 1993). Fleet-averaged emission factors for San Diego County for the year 2010 were provided by the ARB from the California Air Resources Board's OFFROAD model (CARB 2006) and

were used to estimate emissions from heavy equipment. Emissions of fugitive dust were estimated based on methodologies recommended in the URBEMIS2002 model (Rimpo and Associates 2002), and in the SCAQMD's CEQA Air Quality Handbook for earthmoving activities.

Construction emission calculations were based on the construction phases and equipment and crew requirements identified for the project by the project developer and construction contractors. Table 4 presents a summary of the construction phases and equipment needs for each construction phase. According to the construction scenario, required personnel would include 20 operators and 6 additional personnel for most of the construction period; a maximum number of 80 workers would be on site at any one time. For conservative purposes, it was assumed that 80 workers would travel to the site. It was assumed that 25 trucks per day would travel to the construction site to transport materials to the site during construction.

To estimate fugitive dust emissions associated with site grading, it was assumed that a maximum of 100 acres would be graded on a single day. Fugitive dust emissions were estimated using the emission factor for PM_{10} emissions from the URBEMIS model of 10 lbs/acre/day. Assuming a maximum of 100 acres would be graded in a single day, the daily PM_{10} emissions would be as much as 1000 lbs/day. Dust control measures will be implemented to reduce emissions of fugitive dust during grading.

Table 4
Construction Phases and Equipment/Crew Requirements

Construction Phase	Duration, days	Equipment/Crew	Number
Grading	180	D-6 Dozers	2
		D-8 Dozers	2
		D-9 Dozers	6
		834 Rubber-tire Dozers	4
		657 Scrapers	12
		16-6 Blades	2
		Water Trucks	8
		Dump Trucks	4
Paving	180	Concrete Trucks	2
		Pavers	2
		Backhoes	2
		Trackhoes	2
Off-site Road Improvements	180	Dozers	2
		Front-end Loader	1
		Scrapers	4
		Tractor	1
		Backhoes	2
		Pavers/Rollers	2
		Dump Trucks	4
		Water Trucks	2
		Concrete Mixers	2
		Jackhammers	8
House Construction	500	Cranes	2
		Generators	4
		Forklifts	8
		Crew Trucks	2
Commercial/Industrial Construction	500	Cranes	2
		Generators	4
		Forklifts	8
		Crew Trucks	2

These measures constitute best management practices for dust control. The SCAQMD's Air Quality Handbook, Table 11-4, provides control efficiencies to estimate the efficiency of the dust control measures required by the Grading Ordinance. Best management practices to reduce the amount of fugitive dust generated from construction of the proposed project, and their respective control efficiencies (based on control efficiencies provided in the SCAQMD CEQA Air Quality Handbook, Table 11-4), include the following:

- Multiple applications of water during grading between dozer/scraper passes (at least three times daily)Paving, chip sealing or chemical stabilization of internal roadways after completion of grading
- Use of sweepers or water trucks to remove "track-out" at any point of public street access
- Termination of grading if winds exceed 25 mph
- Stabilization of dirt storage piles by chemical binders, tarps, fencing or other erosion control
- Hydroseeding of graded residential lots, which would only be required if lots are not developed immediately after grading

Although it was assumed that all of the above dust control_measures would be implemented, to model the most conservative construction estimates, only application of water during grading was taken into consideration when applying a control efficiency on particulate emissions. Based on the URBEMIS Model, Version 9.2.4, the control efficiency for watering 3 times daily is 61 percent. For conservative purposes, the other control measures were not accounted for in the mitigated emission calculations. With implementation of these dust control measures, emissions of fugitive dust during grading would be approximately 390 lbs/day for the major grading of the project.

Minor amounts of blasting may be required at the site during initial site preparation. Fugitive dust emissions associated with blasting were estimated based on the U.S. EPA's emission factor for blasting for coal mining to remove overburden, which is a similar process. According to Section 11.9 of AP-42, emissions from blasting are calculated as follows:

$$\text{Lbs } PM_{10}/\text{blast} = 0.000014(A)^{1.5} \times 0.52 \text{ lbs } PM_{10}/\text{lbs TSP}$$

It was estimated that a maximum area of 40,000 square feet per day of blasting could be required to remove overburden prior to project construction, for total PM_{10} emissions of 58.24 lbs/day. Blasting was assumed to occur during the grading phase.

The project would utilize ammonium nitrate/fuel oil ANFO explosives to conduct blasting on site. Based on the U.S. EPA's AP-42 emission factors in Section 13.3, emissions from use of ANFO are estimated at 67 lbs CO per ton of explosive, and 17 lbs NOx per ton of explosive. Based on typical construction projects, it was estimated that a maximum of 10,000 lbs per day

could be used at the site; thus the maximum daily emissions due to the use of ANFO would be 335 lbs/day of CO and 85 lbs/day of NOx.

According to the URBEMIS model, emissions from asphalt offgassing can be estimated by assuming an emission rate of 2.62 lbs/acre of area to be paved. The amount to be paved was estimated to be one acre per day during the paving construction phase.

For the purpose of estimating emissions from the application of architectural coatings, it was assumed that water-based coatings would be used for both exterior and interior surfaces, and that coatings would be applied using electrostatic spray guns and/or brushes. It was assumed that the architectural coatings application would take place during the residence construction phase. The methodology presented in Table A11-13-D of the SCAQMD CEQA Air Quality Handbook was used to estimate emissions from the use of water-based coatings.

Emissions associated with worker travel to the construction site and construction truck deliveries were calculated using the EMFAC2007 emissions estimation model (California Air Resources Board 2007). The number of workers for each construction phase was used to estimate emissions for each phase associated with worker commutes during the construction period. Where numbers of workers were not provided, estimates were developed based on the methodology recommended in the SCAQMD CEQA Air Quality Handbook, Table A9-17. It was assumed workers would travel 36 miles round trip to the site (the approximately travel distance to Escondido). Actual travel distances may be shorter, so this provides a worst-case estimate of worker travel emissions. It was also assumed that trucks delivering construction materials would travel approximately 36 miles round trip to and from the site (a worst case estimate of distances traveled to bring construction materials from Escondido or San Marcos, the locations of the nearest materials products facilities to the site). Actual travel distances may be shorter depending on the source of construction materials to be used at the site. Based on information for similar projects, it was assumed a maximum of 25 trucks per day would transport materials to the site for each construction phase.

Table 5 provides a summary of the emission estimates for each individual construction phase of the proposed project. Refer to Attachment A for detailed emission calculations. The construction scenario assumed that site grading would represent the worst case emissions for construction of the project. Emissions of NOx and PM_{10} would exceed the screening-level thresholds and would result in a significant air quality impact. Criteria non-attainment pollutants that have been identified as exceeding the screening-level thresholds create a significant cumulative impact, regardless of ground-level concentrations.

4.2.1.3 Mitigation Measures and Design Considerations

Project construction would employ those dust control measures specified above. The main source of NOx emissions during construction of large projects such as the Campus Park Project is emissions from heavy construction equipment. In accordance with County of San Diego Department of Planning and Land Use requirements, the project will require ten percent of the construction fleet to use any combination of diesel catalytic converters, diesel oxidation catalysts, diesel particulate filters and/or ARB certified Tier I, II, or III equipment. Ten percent was determined to be a reasonable requirement based on the amount of contractors whose fleets have already been retrofit and engines repowered as a result of the local and neighboring Carl Moyer Programs. In addition, the project would utilize low-VOC coatings in accordance with SDAPCD Rule 67.0 requirements. With use of ten percent of the construction fleet retrofit and/or repowered and use of low-VOC coatings, the project would mitigate emissions to the extent feasible. Even with application of best management practices to control emissions of fugitive dust and the proposed mitigation measures, emissions of NOx, PM_{10}, and $PM_{2.5}$ during construction exceed the screening-level thresholds. There are no additional feasible mitigation measures to reduce emissions of NOx, PM_{10}, and $PM_{2.5}$ below the level of significance.

An evaluation of the feasibility of using aqueous diesel fuel during construction has been conducted. A review of ARB information on aqueous diesel indicates that most of the uses have been in demonstration projects and not in general construction projects. Funding has been provided for pilot programs/demonstration projects for entities such as the Port of Oakland, with funding from an Alternative Diesel Fuel grant. The Port paid for tank rental and inspection for

the PuriNox fuel to be provided on site, for $13,965. The fuel costs were approximately 19 cents per gallon difference (in 2003); and ARB estimated in 2004 that costs would be 25 cents per gallon higher, but fuel costs have increased substantially since that time.

Aqueous diesel fuel is diesel fuel (LSD or ULSD) blended with up to 20% water and a proprietary additive. The water emulsion has to be stirred regularly when kept in a stationary tank to ensure that the water molecules are completely enclosed by fuel molecules. Stirring is important to avoid separation, which could cause engine corrosion and decreased lubricity. Storage tanks can be equipped with stirring devices such as circulation pumps. Therefore regular storage tanks cannot be used and pumps must be used to stir tanks, using additional electricity and thus generating minor emissions from this process. It would be necessary for the Campus Park project to either rent or purchase special aqueous diesel tanks that are equipped with stirring devices that would maintain the fuel in its emulsified state; thus adding to the costs of using aqueous fuel. According to some of the demonstration projects, use of aqueous fuel requires increased fuel usage in volume, so adds to cost of its use.

PuriNOx was previously available in southern California was used on a previous construction project at the Shell Wilmington Refinery. According to information from the Shell Wilmington Refinery Rule 1105.1 Compliance Project, Lubrizol has indicated that it will no longer manufacture PuriNOx after January 2007; however, PuriNOx could continue to be sold for use in Southern California if another company purchases the license. Telephone calls to Lubrizol to confirm its potential availability have not been returned. The other manufacturers of emulsified diesel fuels (Clean Fuels and Aquazole) have indicated that these materials are not commercially available in southern California.

Petroleum products vendors in southern California were contacted to assess whether they market aqueous diesel fuel. San Diego County petroleum suppliers Chevron, SKS Petroleum, and the SoCo Group, and Long Beach supplier PetroDiamond, all indicated that they do not market aqueous diesel fuel. It would therefore be necessary to truck aqueous diesel fuel to the construction site on a regular basis. Depending on the availability of aqueous diesel fuel, it is anticipated that the shortest distance that trucks would need to transport aqueous diesel fuel to

the construction site would be from the Port of Long Beach, a one-way distance of 96 miles, although suppliers in Long Beach have not confirmed the availability of aqueous diesel for sale. It is likely that at least one truck per week would need to travel to the site during construction; if aqueous fuel is not available from the Port of Long Beach, fuel would need to be trucked in from locations that are farther from the construction site. Use of heavy-duty trucks to truck in fuel would increase emissions of NOx from heavy-duty trucks associated with project construction.

The lack of availability of aqueous fuel within San Diego County, increased costs associated with use of aqueous fuel, need to truck fuel in from remote locations, and the requirement to rent and install specialized storage tanks that allow stirring of fuel, make use of aqueous diesel fuel infeasible for construction of the Campus Park Project.

Table 5
Maximum Daily Estimated Construction Emissions

Emission Source	CO	VOCs	NO_x	SO_x	PM_{10}	$PM_{2.5}$
lbs/day						
Grading						
Fugitive Dust - Grading	-	-	-	-	390.00	81.90
Fugitive Dust – Blasting	-	-	-	-	58.24	12.23
Explosives Emissions	335.00	-	85.00	-	-	-
Heavy Equipment Exhaust	147.40	20.88	668.10	0.73	16.62	14.97
Worker Travel – Vehicle Emissions	25.13	1.66	2.45	0.03	0.22	0.22
Construction Truck Travel – Vehicle Emissions	11.36	2.33	31.67	0.04	1.40	1.39
TOTAL	**518.89**	**24.87**	**787.22**	**0.80**	**466.48**	**110.71**
Screening-Level Thresholds	550	75	250	250	100	55
Above Screening-Level Thresholds?	*No*	*No*	*Yes*	*No*	*Yes*	*Yes*

Table 5 (continued)
Maximum Daily Estimated Construction Emissions

Emission Source	CO	VOCs	NO_x	SO_x	PM_{10}	$PM_{2.5}$
Paving						
Heavy Equipment Exhaust	17.09	1.35	38.61	0.04	1.47	1.31
Asphalt Offgassing	-	2.62	-	-	-	-
Worker Travel – Vehicle Emissions	25.13	1.66	2.45	0.03	0.22	0.22
Construction Truck Travel – Vehicle Emissions	11.36	2.33	31.67	0.04	1.40	1.39
TOTAL	**53.58**	**7.96**	**72.73**	**0.11**	**3.09**	**2.92**
Screening-Level Thresholds	550	75	250	250	100	55
Above Screening-Level Thresholds?	*No*	*No*	*No*	*No*	*No*	*No*
Off-site Road Improvements						
Heavy Equipment Exhaust	61.42	7.65	234.94	0.25	6.79	6.04
Asphalt Offgassing	-	2.62	-	-	-	-
Worker Travel – Vehicle Emissions	25.13	1.66	2.45	0.03	0.22	0.22
Construction Truck Travel – Vehicle Emissions	11.36	2.33	31.67	0.04	1.40	1.39
TOTAL	**97.91**	**14.26**	**269.06**	**0.32**	**8.41**	**7.65**
Screening-Level Thresholds	550	75	250	250	100	55
Above Screening-Level Thresholds?	*No*	*No*	*Yes*	*No*	*No*	*No*
House Construction						
Heavy Equipment Exhaust	12.63	0.94	25.15	0.03	1.11	0.99
Worker Travel – Vehicle Emissions	25.13	1.66	2.45	0.03	0.22	0.22
Construction Truck Travel – Vehicle Emissions	11.36	2.33	31.67	0.04	1.40	1.39
Architectural Coatings	-	43.50	-	-	-	-
TOTAL	**49.12**	**48.43**	**59.27**	**0.10**	**2.73**	**2.60**
Screening-Level Thresholds	550	75	250	250	100	55
Above Screening-Level Thresholds?	*No*	*No*	*No*	*No*	*No*	*No*

Table 5 (continued)
Maximum Daily Estimated Construction Emissions

Emission Source	CO	VOCs	NO_x	SO_x	PM_{10}	$PM_{2.5}$
lbs/day						
Commercial/Industrial Construction						
Heavy Equipment Exhaust	13.98	1.14	31.89	0.03	1.27	1.13
Worker Travel – Vehicle Emissions	25.13	1.66	2.45	0.03	0.22	0.22
Construction Truck Travel – Vehicle Emissions	11.36	2.33	31.67	0.04	1.40	1.39
Architectural Coatings	-	26.65	-	-	-	-
TOTAL	**50.47**	**31.78**	**66.01**	**0.10**	**2.89**	**2.74**
Screening-Level Thresholds	550	75	250	250	100	55
Above Screening-Level Thresholds?	*No*	*No*	*No*	*No*	*No*	*No*

4.2.1.4 Conclusions

Project criteria pollutants emissions during construction would constitute a significant but temporary impact on the ambient air quality.

4.2.2 Operational Impacts

4.2.2.1 Guidelines for the Determination of Significance

Based on the County of San Diego Guidelines (County of San Diego 2007), construction impacts would be potentially significant if they exceed the quantitative screening-level thresholds for attainment pollutants (NO_2, SO_2, and CO), and would result in a significant impact if they exceed the screening-level thresholds for nonattainment pollutants (ozone precursors and particulate matter).

4.2.2.2 Significance of Impacts Prior to Mitigation

The main operational impacts associated with the Project would include impacts associated with traffic; impacts associated with area sources such as energy use, landscaping, and the use of fireplaces at the residences.

Project-generated traffic was addressed in the Campus Park Traffic Impact Study (LOS Engineering, Inc. 2009). Based on the Transportation Analysis, at full buildout the project would generate 19,941 average daily trips (ADT). These trips are associated with the residential development, commercial facilities, and recreational facilities. To estimate emissions associated with Project-generated traffic, the EMFAC2007 model (CARB 2007) was used. The EMFAC2007 model is the latest version of the Caltrans emission factor model for on-road traffic. Because the Project is a residential and commercial development, Project-related traffic was assumed to be comprised of light duty autos and light duty trucks (i.e., small trucks, SUVs, and vans). Based recommendations in the Caltrans ITS Transportation Project-Level Carbon Monoxide Protocol (Caltrans 1998), Appendix B, Page B-3, it was assumed that the vehicle mix, when distributed between light duty autos and light duty trucks, would be 78% light duty autos and 22% light duty trucks. [This assumption was based on Table B.2, Recommended Vehicle Type Distribution, of the Caltrans ITS Transportation Project-Level Carbon Monoxide Protocol, assuming that light duty autos (69% of total vehicle distribution) and light duty trucks (19.4% of total vehicle distribution) comprised 100% of the total vehicle distribution; therefore, light duty autos comprise 69%/(69%+19.4%) or 78%, and light duty trucks comprise 19.4%/(69%+19.4%) or 22% of total vehicles accessing the residential development.] For estimating emission factors associated with light duty autos and light duty trucks, it was assumed that these vehicles would be a mix of non-catalytic, catalytic, and diesel vehicles as indicated in the EMFAC2007 outputs. For conservative purposes, emission factors representing the vehicle mix for 2015 (assumed to be the first year of full occupancy) were used to estimate emissions; based on the results of the EMFAC2007 model for subsequent years, emissions would decrease on an annual basis from 2015 onward due to phase-out of higher polluting vehicles and implementation of more stringent emission standards that are taken into account in the EMFAC2007 model. Vehicle speed was

assumed to be 33 miles per hour, based on an average free-flow speed of 45 miles per hour on main roadways and utilizing the recommended average cruise speed in Appendix B of the Caltrans ITS Transportation Project-Level Carbon Monoxide Protocol, Table B.10, Average Cruise Speed as a Function of Arterial Classification and Free-Flow Speed, for a minor arterial, suburban. Based on the Campus Park Traffic Impact Study, the internal capture rate is assumed to be 30%. The internal capture rate accounts for trips that would remain within the traffic analysis zones (TAZ). The external trip ADT is therefore estimated to be 13,959, while internal trips would total 5,982 ADT. The average vehicle miles traveled for the residential, commercial, and park uses, which account for these 13,959 ADTs, was assumed to be approximately 17.10 miles, based on the average distance that would be traveled from the project to the nearest commercial/occupational nodes, including San Marcos (20.11 miles), Vista (12.55 miles), Escondido (17.63 miles), and Oceanside (18.09 miles). Trip lengths would be greater traveling to San Diego, but shorter traveling to Temecula or the workplaces, commercial development (shopping), and recreational facilities available to Campus Park residents; therefore use of a travel distance of 17.10 miles provides a conservative estimates of vehicle miles traveled. The remaining internal trips that would remain within the TAZ (5,982 ADT) were assumed to travel approximately 0.5 miles per trip. These trips were represented as a mix of all vehicles, including heavy trucks, based on the default vehicle mix in the EMFAC2007 model.

All units were assumed to have natural gas fireplaces. Area source emissions, including emissions from energy use, fireplaces, landscaping, and maintenance use of architectural coatings were calculated using the URBEMIS model. Operational emission calculations and URBEMIS model outputs are provided in Appendix A.

The results of the emission calculations, in lbs/day and tons/year, are summarized in Table 6, along with emissions associated with area sources and a comparison with the County of San Diego significance criteria. The EMFAC2007 model outputs are presented in Appendix A. Table 6 presents a conservative estimate of emissions, because it assumes that all project-related trips would occur by 2015.

Table 6
Total Operational Emissions
2015

	CO	VOC	NOx	SOx	PM10	PM2.5
	Lbs/day[a]					
Energy Use	5.94	0.95	12.35	-	0.02	0.02
Fireplace Natural Gas	3.14	0.43	7.39	0.05	0.60	0.59
Landscaping	27.89	4.57	0.32	0.00	0.08	0.08
Architectural Coatings Use	-	6.78	-	-	-	-
Vehicular Emissions – External Trips	1238.16	93.07	109.69	1.76	17.57	17.39
Road Dust – External Trips	-	-	-	-	23.12	4.85
Vehicular Emissions – Internal Trips	114.27	28.45	6.03	0.05	0.41	0.41
Road Dust – Internal Trips	-	-	-	-	0.29	0.06
TOTAL	**1389.4**	**134.25**	**135.78**	**1.86**	**42.09**	**23.40**
Screening-Level Thresholds	550	75	250	250	100	55
Above Screening-Level Thresholds?	*Yes*	*Yes*	*No*	*No*	*No*	*No*
	Tons/year					
Energy Use	1.08	0.17	2.25	-	0.00	0.00
Fireplace Natural Gas	0.00	0.00	0.00	0.00	0.00	0.00
Landscaping	2.51	0.41	0.03	0.00	0.01	0.01
Architectural Coatings Use	-	1.24	-	-	-	-
Vehicular Emissions – External Trips	225.96	16.98	20.02	0.32	3.11	3.08
Road Dust – External Trips	-	-	-	-	4.22	0.05
Vehicular Emissions – Internal Trips	20.85	5.19	1.10	0.01	0.08	0.08
Road Dust – Internal Trips	-	-	-	-	0.05	0.01
TOTAL	**250.40**	**23.99**	**23.40**	**0.32**	**7.47**	**3.23**
Screening-Level Thresholds	100	13.7	40	100	15	10
Above Screening-Level Thresholds?	*Yes*	*Yes*	*No*	*No*	*No*	*No*

[a]Maximum pounds per day for summer or winter from URBEMIS Model.

Based on the estimates of the emissions associated with project operations, the CO and VOC emissions are above the significance criteria in 2015. Because the emissions are mainly associated with project-related traffic, there are no feasible mitigation measures that would reduce the emissions associated with project operations to below a level of significance. However, because vehicular emissions decrease over time with phase-out of older vehicles and

implementation of increasingly stringent emission controls, future emissions (long term, assumed to be 2040) would be below the significance criteria. The calculations for 2040 are shown in Table 7. Thus the impacts in 2015 would be significant, but temporary, and would be reduced to below the level of significance by 2040 for VOCs.

Table 7
Total Operational Emissions
2040

	CO	**VOC**	**NOx**	**SOx**	**PM10**	**PM2.5**
	Lbs/day					
Energy Use	5.94	0.95	12.35	-	0.02	0.02
Fireplace Natural Gas	3.14	0.43	7.39	0.05	0.60	0.59
Landscaping	27.89	4.57	0.32	0.00	0.08	0.08
Architectural Coatings	-	6.78	-	-	-	-
Vehicular Emissions – External Trips	479.390	31.28	43.70	1.76	17.02	16.85
Road Dust – External Trips	-	-	-	-	23.12	4.85
Vehicular Emissions – Internal Trips	39.17	8.51	1.65	0.05	0.41	0.41
Road Dust – External Trips	-	-	-	-	0.29	0.06
TOTAL	**555.53**	**52.52**	**65.41**	**1.86**	**41.54**	**22.86**
Screening-Level Thresholds	550	75	250	250	100	55
Above Screening-Level Thresholds?	*Yes*	*No*	*No*	*No*	*No*	*No*
	Tons/year					
Energy Use	1.08	0.17	2.25	-	0.00	0.00
Fireplace Natural Gas	0.00	0.00	0.00	0.00	0.00	0.00
Landscaping	2.51	0.41	0.03	0.00	0.01	0.01
Architectural Coatings	-	1.24	-	-	-	-
Vehicular Emissions – External Trips	87.49	5.71	7.97	0.32	3.11	3.08
Road Dust – External Trips	-	-	-	-	4.22	0.05
Vehicular Emissions – Internal Trips	7.15	1.55	0.30	0.01	0.07	0.07
Road Dust – Internal Trips	-	-	-	-	0.05	0.01
TOTAL	**98.23**	**9.08**	**10.55**	**0.33**	**7.46**	**3.22**
Screening-Level Thresholds	100	13.7	40	100	15	10
Above Screening-Level Thresholds?	*No*	*No*	*No*	*No*	*No*	*No*

Because the CO emissions associated with the project were estimated to be above the screening-level thresholds for CO, to further evaluate whether the project would result in a significant

impact, additional analysis for criteria pollutants that exceed the screening-level thresholds was conducted. An analysis was conducted in accordance with Caltrans guidance to evaluate whether emissions of CO, which are above the screening-level thresholds in 2015 and 2040, would cause a ground-level exceedance of the NAAQS or CAAQS for CO.

Projects involving traffic impacts may result in the formation of locally high concentrations of CO, known as CO "hot spots." To verify that the project would not cause or contribute to a violation of the CO standard, a screening evaluation of the potential for CO "hot spots" was conducted. The Transportation Analysis evaluated whether or not there would be a decrease in the level of service at the roadways and/or intersections affected by the Project. The potential for CO "hot spots" was evaluated based on the results of the Transportation Analysis. The Caltrans ITS Transportation Project-Level Carbon Monoxide Protocol (Caltrans 1998) should be followed to determine whether a CO "hot spot" is likely to form due to Project-generated traffic. In accordance with the Protocol, CO "hot spots" are typically evaluated when (a) the level of service (LOS) of an intersection or roadway decreases to a LOS E or worse; (b) signalization and/or channelization is added to an intersection; and (c) sensitive receptors such as residences, commercial developments, schools, hospitals, etc. are located in the vicinity of the affected intersection or roadway segment.

The Transportation Analysis evaluated 29 intersections, 22 roadway segments, and three freeway segments in the project vicinity to evaluate the LOS for Existing, Existing + Project, Existing + Pending Projects, 2030 Without Project, and 2030 With Project. CO "hot spots" would be possible at intersections because intersection traffic is subject to congestion and idling. Table 8 presents a summary of the intersection LOS.

Several intersections and roadway segments would currently operate at LOS E or F, and would operate in future years at LOS E or F with or without project traffic. Based on the traffic analysis, the project would result in a direct significant impact at the following intersections:

- SR-76 (Pala Road) at I-15 NB Ramps
- Old Highway 395 and Reche Road

Mitigation measures to alleviate traffic congestion have therefore been recommended. The Transportation Analysis evaluated the effectiveness of proposed mitigation measures and determined that traffic impacts would be mitigated such that the LOS would not degrade to E or F due to project-related traffic for all intersections evaluated.

Table 8
Intersection Level of Service

Intersection	Existing		Existing + Project		Existing + Cumulative		Existing + Cumulative + Project		Horizon Year (2030)		Horizon Year (2030) + Project	
	am	*pm*	*am*	*pm*	*am*	*pm*	*am*	*pm*	*am*	*pm*	*am*	*pm*
Via Montserate/ Pala Rd.	F	F	F	F	F	F	F	F	C	C	C	C
Gird Rd./Pala Rd.	B	B	B	B	C	E	D	F	B	B	B	B
Sage Rd./Pala Rd.	C	D	C	E	F	F	F	F	C	C	C	D
Old Highway 395/Pala Rd.	C	C	C	C	F	F	F	F	D	D	D	D
Old Highway 395/Dulin Rd.	B	B	B	B	D	E	D	F	C	D	C	C
I-15 SB on/off ramp/Pala Rd.	C	C	C	C	F	F	F	F	C	C	C	C
I-15 NB on/off ramp/Pala Rd.	C	D	C	D	F	F	F	F	D	D	D	D
Pankey Rd./Pala Rd.	B	B	B	D	F	F	F	F	C	C	C	D
Horse Ranch Creek Road/Pala Road	N/A-	N/A	B	C	B	B	C	C	B	B	C	C
Rice Canyon Rd./Pala Rd.	B	B	B	B	F	F	F	F	A	A	A	A
Couser Canyon Rd./Pala Rd.	B	B	B	C	F	F	F	F	A	A	A	A
Pala Mesa Dr./Old Highway 395	B	B	B	C	F	F	F	F	C	D	C	D
Pala Mesa Drive at Sage Road	A	A			A	B	A	B	B	B	B	C
Old Highway 395 at Stewart Canyon Road	B	B	B	C	F	F	F	F	C	C	C	D
Old Highway 395 at Reche Road	C	E	E	F	F	F	F	F	C	D	C	D
Reche Road at Tecalote Road	B	C			B	C	C	C	D	D	D	D
Reche Road at Wilt Road	B	C			B	C	C	C	D	D	D	D
Reche Road at Gird Road	B	B			B	B	B	B	C	C	C	C
Mission Road at Old Highway 395	B	C	B	D	D	F	D	F	C	C	C	D
I-15 SB on/off ramp/Mission Rd.	C	C	D	D	E	D	E	F	C	B	D	C
I-115 NB on/off ramp/Mission Rd.	B	D	B	D	C	F	C	F	C	C	C	C
Stewart Canyon Road at HRCR/Pankey Road	A	A	A	A	A	B	B	B	B	B	B	BC
Horse Ranch Creek Road at Baltimore Oriole	N/A	N/A	B	B	B	B	B	B	B	B	B	B

Table 8 (continued)
Intersection Level of Service

Intersection	Existing		Existing + Project		Existing + Cumulative		Existing + Cumulative + Project		Horizon Year (2030)		Horizon Year (2030) + Project	
	am	*pm*	*am*	*pm*	*am*	*pm*	*am*	*pm*	*am*	*pm*	*am*	*pm*
Horse Ranch Creek Road at Longspur Road	N/A	N/A	A	B	B	B	C	C	C	B	C	C
Horse Ranch Creek Road at Harvest Glen Lane	N/A	N/A	B	C	B	B	B	C	B	B	C	C
Horse Ranch Creek Road at Pardee South Loop	N/A	N/A	B	B	B	B	B	C	B	B	B	C
Horse Ranch Creek Road at School/Park Access	N/A	N/A	A	A	B	B	C	C	B	B	C	C
Horse Ranch Creek Road at Street R	N/A	N/A	B	C	A	A	B	B	B	B	B	B
Pankey Road/Pala Mesa Drive at Street R	N/A	N/A	A	A	C	C	C	D	C	D	C	D
SR-76 at Melrose Drive	C	C			F	E	F	F				
SR-76 at E. Vista Way	E	D			F	F	F	F				
SR-76 at North River Road	E	C			F	F	F	F				
SR-76 at Olive Hill Road	D	D			F	F	F	F				
SR-76 at S. Mission Road	B	C	B	C	D	F	D	F	D	C	D	D
Reche Road at Live Oak Park Road	C	C			E	C	E	D				
Reche Road at Green Canyon Norte	C	C			C	C	C	C				
SR-76 at Pala Mission Road	C	C			D	D	D	D				

To evaluate the potential for CO "hot spots," the procedures in the Caltrans ITS Transportation Project-Level Carbon Monoxide Protocol were used. Those intersections for which the Project would cause a direct significant impact were evaluated, as cumulative impacts would be associated with total traffic in the area, and, as discussed in the Traffic Impact Study, would be fully mitigated by the Horizon Year 2030. As recommended in the Protocol, CALINE4 modeling was conducted for the intersections identified above for the Project plus cumulative traffic scenario. Modeling was conducted based on the guidance in Appendix B of the Protocol to calculate maximum predicted 1-hour CO concentrations. Predicted 1-hour CO concentrations

were then scaled to evaluate maximum predicted 8-hour CO concentrations using the recommended scaling factor of 0.7 for urban locations.

Inputs to the CALINE4 model were obtained from the Traffic Impact Analysis. As recommended in the Protocol, receptors were located at locations that were approximately 3 meters from the mixing zone, and at a height of 1.8 meters. For conservative purposes, average approach and departure speeds were assumed to be 1 mph, which results in higher CO emission rates and a conservative estimate of potential impacts. For conservative purposes, emission factors from the EMFAC2007 model for the year 2015 (full buildout) were used in the CALINE4 model, as emission factors for future years would be less than for 2015.

In accordance with the Caltrans ITS Transportation Project-Level Carbon Monoxide Protocol, it is also necessary to estimate future background CO concentrations in the project vicinity to determine the potential impact plus background and evaluate the potential for CO "hot spots" due to the project. The existing maximum 1-hour and 8-hour background concentrations of CO that was measured at the Escondido monitoring station for the period 2004 – 2007 of 6.3 and 3.81 ppm were used to represent future maximum background 1-hour and 8-hour CO concentrations. CO concentrations in the future may be lower as inspection and maintenance programs and more stringent emission controls are placed on vehicles.

The CALINE4 model outputs are provided in Attachment A of this report. Table 9 presents a summary of the predicted CO concentrations (impact plus background) for the intersections evaluated for the Existing plus Cumulative plus Project traffic for the affected intersections. As shown in Table 9, the predicted CO concentrations would be substantially below the 1-hour and 8-hour NAAQS and CAAQS for CO shown in Table 1 of this report. Therefore, no exceedances of the CO standard are predicted, and the project would not cause or contribute to a violation of the air quality standard.

Table 9
CO "Hot Spots" Modeling Results

Intersection	Maximum 1-hour CO Concentration plus Background, ppm (CAAQS = 20 ppm)		Maximum 8-hour CO Concentration plus Background, ppm (CAAQS = 9 ppm)
	Am	*pm*	
SR 76/I-15 NB Ramps	6.9	7.3	4.51
Old Highway 395/Reche Road	6.8	6.9	4.23

As shown in Table 9, all impacts, when added to background CO concentrations, would be below the CAAQS for both the 1-hour and 8-hour averaging periods; therefore, the project would not result in a significant impact for CO.

4.2.2.3 Mitigation Measures and Design Considerations

As discussed in the Traffic Impact Analysis – Campus Park (LOS Engineering, Inc. 2008), certain intersections would be mitigated through implementation of traffic improvement projects and TIF program, and could include installing traffic signals. Certain of the mitigation measures are dependent on fair share contributions. However, due to reductions in CO emissions over time, CO "hot spots" would not occur at affected intersections. Because traffic impacts would be mitigated to less than significant levels and emissions of CO would continue to decrease with increasingly stringent vehicular emission standards and phase-out of older vehicles, CO "hot spots" would not result and no mitigation measures are required.

The project will be designed to meet or exceed current Title 24 energy efficiency standards and would thus result in less emissions than non-energy efficient developments. Furthermore, because the project provides mixed uses, it is designed to reduce trips and trip lengths. For conservative purposes, trip lengths were estimated based on commuting distances to the nearest

population centers within San Diego County; however, distances would likely be reduced for a portion of those trips due to the design of the project with mixed uses.

4.2.2.4 Conclusions

Emissions of CO and VOCs would exceed the screening-level thresholds for project operations. Because CO is associated with traffic impacts, an evaluation of the potential for CO "hot spots" was conducted in accordance with Caltrans guidance. Because CO "hot spots" modeling indicated that, even without mitigation, traffic congestion at those intersections experiencing a direct project impact would not result in exceedances of the CO standard, the project would not result in a significant impact for CO.

Emissions of VOCs are above the screening-level thresholds initially, but would be reduced to less than significant levels due to the phase-out of older vehicles and increasingly stringent vehicle emission standards. Because the project does not exceed the growth projections in the SANDAG growth forecasts for the Fallbrook Subregional Area as discussed in Section 4.1.2, the project would not result in an exceedance of the ozone standard and impacts associated with project operations would therefore be less than significant.

4.3 Cumulatively Considerable Net Increase of Criteria Pollutants

4.3.1 Construction Impacts

4.3.1.1 Guidelines for the Determination of Significance

Based on the County of San Diego guidelines (County of San Diego 2007), a project would result in a cumulatively significant impact if the project results in a significant contribution to the cumulative increase in pollutants for which the SDAB is listed as nonattainment for the CAAQS and NAAQS. As discussed in Section 2.0, the SDAB is considered a nonattainment area for the NAAQS for ozone and the CAAQS for ozone, PM_{10}, and $PM_{2.5}$.

Cumulatively considerable net increases during the construction phase would typically happen if two or more projects near each other are simultaneously constructing projects. A project that has a significant direct impact on air quality with regard to emissions of PM_{10}, $PM_{2.5}$, NOx, or VOCs during construction would also have a significant cumulatively considerably net increase. In the event direct impacts from a proposed project are less than significant, a project may still have a cumulatively considerable impact on air quality if the emissions of concern from the proposed project, in combination with the emissions of concern from other proposed projects or reasonably foreseeable future projects within a proximity relevant to the pollutants of concern, are in excess of the guidelines identified in Section 3.0.

4.3.1.2 Significance of Impacts Prior to Mitigation

As discussed in Section 4.2.1.4, emissions of NOx and PM_{10} during construction would exceed the screening-level thresholds and would result in a significant air quality impact. Criteria non-attainment pollutants that have been identified as exceeding the screening-level thresholds create a significant cumulative impact, regardless of ground-level concentrations. Thus project construction would result in a cumulatively considerable net increase in NOx and PM_{10}. This impact would be temporary.

4.3.1.3 Mitigation Measures and Design Considerations

Mitigation measures for construction are discussed in Section 4.2.1.3. As discussed in that section, there are no feasible mitigation measures that would reduce emissions below a level of significance for construction.

4.3.1.4 Conclusions

Project construction would result in a cumulatively considerable net increase in emissions of NOx and PM_{10}. Impacts would remain significant even with design considerations to reduce fugitive dust during construction. Project construction would therefore result in a significant, but temporary, cumulative impact to the ambient air quality.

4.3.2 Operational Impacts

4.3.2.1 Guidelines for the Determination of Significance

As discussed above, based on the County of San Diego guidelines (County of San Diego 2007), a project would result in a cumulatively significant impact if the project results in a significant contribution to the cumulative increase in NOx, VOCs, PM_{10}, and $PM_{2.5}$. In accordance with the guidelines, a project that does not conform to the RAQS and/or has a significant direct impact on air quality with regard to operational emissions of nonattainment pollutants would also have a cumulatively considerable net increase. Also, projects that cause road intersections to operate at or below a LOS E and create a CO "hot spot" create a cumulatively considerable net increase of CO.

4.3.2.2 Significance of Impacts Prior to Mitigation

As discussed in Section 4.2.2.2, operational CO emissions would be above the screening-level thresholds. Based on the analysis presented in Section 4.1, the project would be consistent with the RAQS and SIP. It was further demonstrated in Section 4.2.2.2 that CO emissions would not result in a CO "hot spot"; therefore the project would not result in a significant cumulatively considerable net increase in emissions.

4.3.2.3 Mitigation Measures and Design Considerations

As discussed in Section 4.2.2.3, the project will be designed to meet or exceed current Title 24 energy efficiency standards and would thus result in less emissions than non-energy efficient developments. Furthermore, because the project provides mixed uses, it is designed to reduce trips and trip lengths and to provide occupational opportunities within close proximity to residents. The project is also designed to provide retail for the convenience of residents.

4.3.2.4 Conclusions

Emissions of CO would exceed the screening-level thresholds for project operations. As discussed in Section 4.2.2.4, no exceedances of the CO standard would occur and the project would not result in a significant cumulatively considerable impact for CO.

Because the project, along with all other planned and reasonably foreseeable projects within the Fallbrook Subregional Area, does not exceed the growth projections in the SANDAG growth forecasts for the area, the project would not result in an exceedance of the ozone standard and impacts associated with project operations would not result in a cumulatively considerable impact.

4.4 Impacts to Sensitive Receptors

4.4.1 Guidelines for the Determination of Significance

Air quality regulators typically define "sensitive receptors" as schools, hospitals, resident care facilities, day-care centers, or other facilities that may house individuals with health conditions that would be adversely impacted by changes in air quality. However, for the purpose of CEQA analysis, the County of San Diego definition of "sensitive receptors" includes residences (County of San Diego 2007). The two primary emissions of concern for impacts to sensitive receptors are CO and diesel particulate matter. As discussed in Section 4.2.3.2, operational impacts would not result in CO "hot spots" because all intersections would be mitigated to LOS D or better. This analysis therefore focuses on diesel particulate matter.

4.4.2 Significance of Impacts Prior to Mitigation

To evaluate whether project construction could pose a significant impact to nearby sensitive receptors, an evaluation of diesel exhaust particulate matter was conducted. Diesel exhaust particulate matter is known to the state of California as carcinogenic compounds. The risks

associated with exposure to substances with carcinogenic effects are typically evaluated based on a lifetime of chronic exposure, which is defined in the California Office of Environmental Health Hazard Assessment (OEHHA) guidelines, *The Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments* (OEHHA 2003a) as 24 hours per day, 7 days per week, 365 days per year, for 70 years. Diesel exhaust particulate matter would be emitted during construction due to the operation of heavy equipment at the site. Because diesel exhaust particulate matter is considered to be carcinogenic, long-term exposure to diesel exhaust emissions have the potential to result in adverse health impacts.

To assess whether there is a potential for a significant impact associated with exposure to diesel exhaust particulate matter, a health risk evaluation was conducted on the particulate emissions. The amount of diesel particulate varies with the project schedule and construction phasing. Detailed information regarding the construction schedule is not available at this time; therefore, based on information from the project developer, it was assumed that all three phases would be completed within a two-year period for conservative purposes. Diesel particulate emissions from heavy equipment for each project phase were estimated as shown in Table 9 below.

Table 9
Diesel Exhaust Particulate Emissions

Construction Phase	Diesel Particulate Emissions, total pounds	Days
Grading	2990.76	180
Paving	263.94	180
Off-site Road Improvements	1221.37	180
House Construction	555.39	500
Commercial/Industrial Buildings Construction	318.16	250

Because construction could occur throughout the site, the construction heavy equipment sources were represented as five separate point sources located throughout the project site. Emissions were allocated to these sources based on the estimated maximum emission rates during construction. The emission sources were represented as a point source 10 feet high, with a stack diameter of 6 inches, a stack exit temperature of 300 F, and a stack exit velocity of 1 meters/second, which is considered to be a minimum stack velocity. It was assumed that the equipment would operate for 8 hours per day, 6 days per week.

The nearest existing receptors were located based on the site map and the USGS 7.5-minute maps for the project area. Discrete receptors were placed at locations along Interstate 15 and Pala Road. The risk evaluation was conducted to assess the potential for an unacceptable risk at these existing receptors due to exposure to diesel particulate emissions from heavy construction equipment during construction.

The U.S. EPA's approved air dispersion model, ISCST3 (U.S. EPA 1999), was used to estimate the downwind impacts at the closest receptors to the construction site. The model was run using preprocessed meteorological data from the Escondido surface meteorological monitoring station and the MCAS Miramar upper air meteorological monitoring station for 2000. Escondido is closest meteorological monitoring station for which pre-processed surface meteorological data are available from the San Diego Air Pollution Control District. Risk were estimated using the Office of Environmental Health Hazard Assessment (OEHHA)'s unit risk factor of 3×10^{-4} $(\mu g/m^3)^{-1}$ for diesel particulate, which is an upper-bound cancer risk estimate based on 70 years of exposure. Because the unit risk factor is based on 70 years (25550 days) of exposure for 24 hours per day, 365 days per year, the results of the analysis were scaled to account for exposure for the phase-by-phase construction duration, as shown in the calculation below.

Risk = Excess cancer risk for 70 years x (days of construction/25550 days).

Based on the above equation, the maximum excess cancer risk predicted would be 0.667 in a million. This value is below the County of San Diego Department of Land Use and Planning's recommended significance threshold of 1 in 1 million without application of T-BACT. The project will therefore be below the threshold of significance for health risks during construction.

Vehicular traffic may result in minor amounts of toxic air contaminants (TACs). Based on the County of San Diego's requirements, a quantitative evaluation of the potential for risks associated with exposure to diesel particulate emissions generated by vehicles from the proposed residences must be conducted. For the Campus Park Project itself, based on EMFAC2007 outputs for 2015 (provided in Appendix A) and considering only light duty autos and light duty

trucks, the total % of trips for diesel light duty autos is approximately 0.2%, and the total % of trips for diesel light duty trucks is approximately 0.5%. Therefore, there are approximately 22 trips per day out of 11,028 total light duty external auto trips that would be attributable to diesel light duty autos, and approximately 16 trips per day out of 3,311 total light duty truck trips that would be attributable to external trips for diesel light duty trucks for the Campus Park Project. There would be an additional 9 light-duty internal auto trips and 7 light-duty internal truck trips attributable to diesel. Allocating the diesel particulate daily trips to the two sets of travelers, daily emissions of diesel particulate for the residential/commercial development were calculated to be 0.00197 lbs/day.

Potential impacts to sensitive receptors were evaluated based on the South Coast Air Quality Management District's "Health Risk Assessment Guidance for Analyzing Cancer Risks from Mobile Source Diesel Emissions" (SCAQMD 2002). According to the Guidance, the ISCST3 model should be used to estimate impacts associated with diesel particulate exhaust emissions. The Guidance recommends the use of multiple adjacent volume sources to represent emission sources along the roadway; therefore, to model the potential impacts associated with emissions of diesel particulate from light duty autos and light duty trucks traveling through the residential commercial development, a series of 72 volume sources was placed along 1.6 miles on Horse Ranch Creek Road, and a series of 19 volume sources was placed along 0.43 miles on Pala Road. Each of the volume sources was assumed to be 36 meters (118 feet) x 36 meters (118 feet), and was assumed to be at ground level. Emissions were divided among the volume sources equally. Annual average concentrations were calculated at each sensitive receptor identified in the project vicinity.

HARP (OEHHA 2003b) was used to estimate the high-end excess cancer risks associated with exposure to diesel particulate from on site traffic. The high-end excess cancer risk was calculated based on guidance from the Office of Environmental Health Hazard Assessment (OEHHA 2003a), using the 80^{th} percentile exposure assumptions for inhalation risks (CARB 2003). The risks were calculated based on 70 years of exposure. The maximum excess cancer risk associated with exposure to diesel particulate from project-generated trips was estimated to be 0.0202 in a million, which is below the San Diego County significance threshold of 1 in a

million. Impacts that are farther from the roadway would be lower as concentrations decrease with increasing distance from the roads.

4.4.3 Mitigation Measures and Design Considerations

As discussed in Section 4.3.2.3, traffic impacts will be mitigated such that all intersections will operate at LOS D or better; thus the potential for CO "hot spots" is mitigated. Because impacts to sensitive receptors from diesel particulate emissions would be less than significant, no additional mitigation measures are required.

4.4.4 Conclusions

Impacts to sensitive receptors would be less than significant.

4.5 Odor Impacts

4.5.1 Guidelines for the Determination of Significance

Based on the County of San Diego guidelines (County of San Diego 2007), a project would have a significant impact if it would generate objectionable odors or place sensitive receptors next to existing objectionable odors which will affect a considerable number of persons or the public.

4.5.2 Significance of Impacts Prior to Mitigation

Project construction could result in minor amounts of odor compounds associated with diesel heavy equipment exhaust. Because the construction equipment would be operating at various locations throughout the construction site, and because any operation that would occur in the vicinity of existing receptors would be temporary, impacts associated with odors during construction are therefore not considered significant.

During construction, diesel equipment operating at the site may generate some nuisance odors; however, due to the distance of sensitive receptors to the project site and the temporary nature of construction, odors associated with project construction would not be significant.

The residential development itself would not be a source of odor impacts. According to the SCAQMD CEQA Air Quality Handbook, land uses associated with odor complaints include agricultural uses, wastewater treatment plants, food processing plants, chemical plants, composting activities, refineries, landfills, dairies, and fiberglass molding operations. These land uses are not proposed for the Campus Park Project. The commercial development may include restaurant uses. Depending on the type of restaurant, some cooking odors may arise from food preparation activities; however, cooking odors are generally not considered objectionable. Furthermore the restaurant uses would be located within the commercial development and not in the immediate vicinity of existing or proposed residences. Thus odor impacts, if generated from the restaurant use, would not be significant.

The only potential odor source for the proposed Project would be odors from the sewer pump station. Odors generated from wastewater are usually the result of gases produced by naturally decaying organic matter in wastewater. Occasionally when wastewater is subject to an anaerobic decomposition (lack of oxygen), the water turns septic and can cause the release of hydrogen sulfide and other odor-causing, reduced sulfur containing compounds. This can occur when low wastewater flows are present in the sewer system.

The system is designed to pump out wastewater several times per hour. The system will be equipped with two redundant pumps that would allow for backup operation of the pumps in the event that one pump is out of service. The wastewater system will also include chemical feed addition at the pump stations to minimize odors. A back-up chemical injection system will be included for further odor control redundancy. Therefore, no significant impact would result from sewer pump station odors.

The project could produce objectionable odors, which would result from volatile organic compounds, ammonia, carbon dioxide, hydrogen sulfide, methane, alcohols, aldehydes, amines,

carbonyls, esters, disulfides dust and endotoxins from the construction and operational phases. However, these substances, if present at all, would only be in trace amounts (less that 1 $\mu g/m^3$). Subsequently, no significant air quality odor impacts are expected to affect surrounding receptors. Moreover, the affects of objectionable odors are localized to the immediate surrounding area and will not contribute to a cumulatively considerable odor. A list of past, present and future projects within the surrounding area were evaluated and none of these projects create objectionable odors.

4.5.3 Mitigation Measures and Design Considerations

Because the project would not generate objectionable odors or place sensitive receptors near existing odor sources that would affect a considerable number of persons or the public, no mitigation measures or additional design considerations are required.

4.5.4 Conclusions

The project is a residential and commercial development. According to the County of San Diego's Zoning Ordinance, Section 6318, "all commercial and industrial uses shall be so operated as to not emit matter causing unpleasant odors which are perceptible by the average person at or beyond any lot line of the lot containing said uses." In general, this ordinance applies to commercial and industrial land uses following development. Due to the nature of the development as a residential and neighborhood commercial development, there are no significant odorous air emissions anticipated from normal operations at the Campus Park development. While neighborhood commercial uses could have operations that result in odor emissions such as dry cleaners, restaurants, and manicure facilities, these facilities are not considered land uses that are sources of nuisance odors (SCAQMD 1993); emissions of substances with odors would be minor and these uses would not be regarded as sources of significant impacts to the Campus Park development or surrounding land usese. Odor impacts are therefore less than significant.

5.0 SUMMARY OF RECOMMENDED DESIGN FEATURES, IMPACTS, AND MITIGATION

In summary, the proposed project would result in emissions of air pollutants for both the construction phase and operational phase of the project. The air quality impact analysis evaluated the potential for adverse impacts to the ambient air quality due to construction and operational emissions. Construction emissions would include emissions associated with fugitive dust, heavy construction equipment and construction worker commuting to and from the site. The emissions associated with construction are above the significance criteria for the maximum construction scenario and would therefore pose a significant, but temporary, impact on the ambient air quality during construction. Measures that are incorporated into the project description to reduce impacts associated with construction include the following:

- Multiple applications of water during grading between dozer/scraper passes – 34-68%
- Paving, chip sealing or chemical stabilization of internal roadways after completion of grading – 92.5%
- Use of sweepers or water trucks to remove "track-out" at any point of public street access – 25-60%
- Termination of grading if winds exceed 25 mph – not quantified
- Stabilization of dirt storage piles by chemical binders, tarps, fencing or other erosion control – 30-65%
- Hydroseeding of graded residential lots unless lots are developed immediately after grading – 30-65%
- The project will require ten percent of the construction fleet to use any combination of diesel catalytic converters, diesel oxidation catalysts, diesel particulate filters and/or ARB certified Tier I, II, or III equipment.

These measures constitute best management practices for dust control, diesel particulate, and construction equipment emissions. Despite implementation of these measures to reduce emissions associated with construction, emissions of NOx and PM_{10} would be above the screening-level thresholds and because they are nonattainment pollutants, the construction impacts would remain significant.

Operational emissions would be associated with traffic accessing the Campus Park development, with area sources such as fireplaces, energy use, and landscaping. Based on the evaluation of air emissions, the project emissions would exceed the screening-level thresholds for CO and VOCs, and would therefore pose a significant impact on the ambient air quality. Because the project's operational emissions are mainly associated with vehicular traffic from project-related vehicle trips, there are no feasible mitigation measures to reduce emissions below a level of significance. However, the project-related traffic would not result in CO "hot spots". Furthermore, emissions associated with traffic would decrease with time as older vehicles are phased out and more stringent emission standards are applied to new vehicles. With use of natural gas fireplaces in the residential development and decreases in vehicular emissions projected for future years, emissions would ultimately be below the County's significance thresholds and the project would not cause or contribute to a long-term exceedance of an air quality standard.

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Attachment A

Emission Calculations

Table A-1
Construction Heavy Equipment Emissions
Campus Park Project

Equipment	FUEL	HP	Load Factor	Emission Factors CO (lb/bhp-hr)	VOC (lb/bhp-hr)	NOX (lb/bhp-hr)	SOX (lb/bhp-hr)	PM10 (lb/bhp-hr)	CO2 (lb/bhp-hr)	No of Equipment	Hrs Per Day	Days in Service	Emissions CO lbs/day	VOC lbs/day	NOX lbs/day	SOX lbs/day	PM10 lbs/day	CO2 lbs/day	Emission, tons (total) CO tons (total)	VOC tons (total)	NOX tons (total)	SOX tons (total)	PM10 tons (total)
Phase 1: Grading																							
D-8 Crawler Dozer	DIESEL	347	59	2.0283E-03	3.0865E-04	9.9429E-03	1.0800E-05	2.4251E-04	1.25E+00	2	8	180	6.64	1.01	32.57	0.04	0.79	4104.08	0.598	0.091	2.931	0.003	0.071
D-6 Dozer	DIESEL	145	59	5.9525E-03	3.5274E-04	9.7886E-03	1.0800E-05	3.5274E-04	1.25E+00	2	8	180	8.15	0.48	13.40	0.01	0.48	1714.96	0.733	0.043	1.206	0.001	0.043
D-9 Dozer	DIESEL	464	59	2.0283E-03	3.0865E-04	9.9429E-03	1.0800E-05	2.4251E-04	1.25E+00	6	8	180	26.65	4.06	130.65	0.14	3.19	16463.62	2.399	0.365	11.759	0.013	0.287
834 Tractor (utility compact)	DIESEL	481	46.5	2.0283E-03	3.0865E-04	9.9429E-03	1.0800E-05	2.4251E-04	1.25E+00	4	8	180	14.52	2.21	71.16	0.08	1.74	8967.31	1.307	0.199	6.405	0.007	0.156
657 Scraper	DIESEL	440	66	2.0283E-03	3.0865E-04	9.9429E-03	1.0800E-05	2.4251E-04	1.25E+00	12	8	180	56.54	8.60	277.19	0.30	6.76	34928.67	5.089	0.774	24.947	0.027	0.608
16-6 Blades	DIESEL	157	57.5	5.9525E-03	3.5274E-04	9.7886E-03	1.0800E-05	3.5274E-04	1.25E+00	2	8	180	8.58	0.51	14.10	0.02	0.51	1805.07	0.772	0.046	1.269	0.001	0.046
Water Trucks	DIESEL	250	41	2.0283E-03	3.0865E-04	9.9429E-03	1.0800E-05	2.4251E-04	1.25E+00	8	8	180	13.31	2.02	65.23	0.07	1.59	8218.98	1.197	0.182	5.870	0.006	0.143
Dump Trucks	DIESEL	489	41	2.0283E-03	3.0865E-04	9.9429E-03	1.0800E-05	2.4251E-04	1.25E+00	4	8	180	13.01	1.98	63.79	0.07	1.56	8038.16	1.171	0.178	5.741	0.006	0.140
													147.40	**20.88**	**668.10**	**0.73**	**16.62**	**84240.86**	**13.27**	**1.88**	**60.13**	**0.07**	**1.50**
Phase 2: Paving																							
Pavers	DIESEL	91	59	6.8123E-03	4.1888E-04	1.1045E-02	1.0800E-05	5.2911E-04	1.25E+00	2	8	180	5.85	0.36	9.49	0.01	0.45	1076.29	0.527	0.032	0.854	0.001	0.041
Backhoes	DIESEL	79	46.5	6.8123E-03	4.1888E-04	1.1045E-02	1.0800E-05	5.2911E-04	1.25E+00	2	8	180	4.00	0.25	6.49	0.01	0.31	736.40	0.360	0.022	0.584	0.001	0.028
Trackhoes	DIESEL	77	46.5	6.8123E-03	4.1888E-04	1.1045E-02	1.0800E-05	5.2911E-04	1.25E+00	2	8	180	3.90	0.24	6.33	0.01	0.30	717.76	0.351	0.022	0.569	0.001	0.027
Concrete Trucks	DIESEL	250	41	2.0283E-03	3.0865E-04	9.9429E-03	1.0800E-05	2.4251E-04	1.25E+00	2	8	180	3.33	0.51	16.31	0.02	0.40	2054.75	0.299	0.046	1.468	0.002	0.036
													17.09	**1.35**	**38.61**	**0.04**	**1.47**	**4585.19**	**1.54**	**0.12**	**3.48**	**0.00**	**0.13**
Phase 3 : Widening Off-site Roads																							
Dozers	DIESEL	356	59	2.0283E-03	3.0865E-04	9.9429E-03	1.0800E-05	2.4251E-04	1.25E+00	2	8	180	6.82	1.04	33.41	0.04	0.81	4210.52	0.613	0.093	3.007	0.003	0.073
Front-end Loader	DIESEL	77	46.5	6.8123E-03	4.1888E-04	1.1045E-02	1.0800E-05	5.2911E-04	1.25E+00	1	8	180	1.95	0.12	3.16	0.00	0.15	358.88	0.176	0.011	0.285	0.000	0.014
Scrapers	DIESEL	267	66	2.0283E-03	3.0865E-04	9.9429E-03	1.0800E-05	2.4251E-04	1.25E+00	4	8	180	11.43	1.74	56.02	0.06	1.37	7058.77	1.028	0.157	5.042	0.005	0.123
Tractor	DIESEL	77	46.5	6.8123E-03	4.1888E-04	1.1045E-02	1.0800E-05	5.2911E-04	1.25E+00	1	8	180	1.95	0.12	3.16	0.00	0.15	358.88	0.176	0.011	0.285	0.000	0.014
Backhoe	DIESEL	79	46.5	6.8123E-03	4.1888E-04	1.1045E-02	1.0800E-05	5.2911E-04	1.25E+00	2	8	180	4.00	0.25	6.49	0.01	0.31	736.40	0.360	0.022	0.584	0.001	0.028
Pavers	DIESEL	91	59	6.8123E-03	4.1888E-04	1.1045E-02	1.0800E-05	5.2911E-04	1.25E+00	2	8	180	5.85	0.36	9.49	0.01	0.45	1076.29	0.527	0.032	0.854	0.001	0.041
Dump Trucks	DIESEL	489	41	2.0283E-03	3.0865E-04	9.9429E-03	1.0800E-05	2.4251E-04	1.25E+00	4	8	180	13.01	1.98	63.79	0.07	1.56	8038.16	1.171	0.178	5.741	0.006	0.140
Water Trucks	DIESEL	250	41	2.0283E-03	3.0865E-04	9.9429E-03	1.0800E-05	2.4251E-04	1.25E+00	2	8	180	3.33	0.51	16.31	0.02	0.40	2054.75	0.299	0.046	1.468	0.002	0.036
Concrete Mixers	DIESEL	489	41	2.0283E-03	3.0865E-04	9.9429E-03	1.0800E-05	2.4251E-04	1.25E+00	2	8	180	6.51	0.99	31.90	0.03	0.78	4019.08	0.586	0.089	2.871	0.003	0.070
Jackhammers	DIESEL	22	74	6.3053E-03	5.2911E-04	1.0759E-02	1.0800E-05	7.7162E-04	1.25E+00	8	8	180	6.57	0.55	11.21	0.01	0.80	1305.41	0.591	0.050	1.009	0.001	0.072
													61.42	**7.65**	**234.94**	**0.25**	**6.79**	**29217.14**	**5.53**	**0.69**	**21.14**	**0.02**	**0.61**

HOUSE CONSTRUCTION

		HP	Load Factor	Emission Factors (lb/bhp-hr) CO	VOC	NOX	SOX	PM10	CO2	No of Equip	Hrs Per Day	Days in Service											
Cranes	DIESEL	194	43	2.0283E-03	3.0865E-04	1.0097E-02	1.0800E-05	2.4251E-04	1.25E+00	1	8	500	1.35	0.21	6.74	0.01	0.16	836.13	0.34	0.05	1.68	0.00	0.04
Generator Sets	DIESEL	22	74	6.3053E-03	5.2911E-04	1.0759E-02	1.0800E-05	7.7162E-04	1.25E+00	2	8	500	1.64	0.14	2.80	0.00	0.20	326.35	0.41	0.03	0.70	0.00	0.05
Forklifts	DIESEL	93	47.5	6.8123E-03	4.1888E-04	1.1045E-02	1.0800E-05	5.2911E-04	1.25E+00	4	8	500	9.63	0.59	15.61	0.02	0.75	1771.09	2.41	0.15	3.90	0.00	0.19
													12.63	**0.94**	**25.15**	**0.03**	**1.11**	**2933.58**	**3.16**	**0.23**	**6.29**	**0.01**	**0.28**

COMMERCIAL BUILDINGS CONSTRUCTION

Phase Equipment - Fuel		HP	Load Factor	Emission Factors (lb/bhp-hr) CO	VOC	NOX	SOX	PM10	CO2	No of Equip	Hrs Per Day	Days in Service											
Cranes	DIESEL	194	43	2.0283E-03	3.0865E-04	1.0097E-02	1.0800E-05	2.4251E-04	1.25E+00	2	8	250	2.71	0.41	13.48	0.01	0.32	1672.26	0.34	0.05	1.68	0.00	0.04
Generator Sets	DIESEL	22	74	6.3053E-03	5.2911E-04	1.0759E-02	1.0800E-05	7.7162E-04	1.25E+00	2	8	250	1.64	0.14	2.80	0.00	0.20	326.35	0.21	0.02	0.35	0.00	0.03
Forklifts	DIESEL	93	47.5	6.8123E-03	4.1888E-04	1.1045E-02	1.0800E-05	5.2911E-04	1.25E+00	4	8	250	9.63	0.59	15.61	0.02	0.75	1771.09	1.20	0.07	1.95	0.00	0.09
													13.98	**1.14**	**31.89**	**0.03**	**1.27**	**3769.71**	**1.75**	**0.14**	**3.99**	**0.00**	**0.16**

Table A-2
Construction Truck Emissions
Campus Park Project

							VOCs		PM10				Emissions, lbs/day				
Construction Phase	**Vehicle Class**	**No. of Trucks Per Construction Phase**	**Speed (mph)**	**VMT (mi/vehicle-day)**	**CO Running Exhaust (g/mi)**	**NO_x Running Exhaust (g/mi)**	**Running Exhaust (g/mi)**	**SOx Running Exhaust (g/mi)**	**Running Exhaust (g/mi)**	**Tire Wear (g/mi)**	**Brake Wear (g/mi)**	**CO2 Running Exhaust (g/mi)**	CO	NOx	VOCs	SOx	PM10
All	Heavy-duty truck	25	27	36	5.726	15.962	1.176	0.019	0.641	0.036	0.028	1992.661	***11.36***	***31.67***	***2.33***	***0.04***	***1.40***

Table A-3
Construction Worker Commute Emissions
Campus Park Project

Construction Worker Estimates and Emission Calculations

										VOCs								PM10					Emissions, lbs/day						Emissions, total tons
Construction Phase	**Vehicle Class**	**No. of Workers Per Construction Phase**	**Speed (mph)**	**VMT (mi/vehicle-day)**	**CO**		**NO_x**		**Running Exhaust (g/mi)**	**Start-Up (g/start)[a]**	**Hot-Soak (g/trip)**	**Resting Loss (g/hr)**	**Running Evaporative (g/mi)**	**Diurnal Evaporative (g/hr)**	**SOx**		**Running Exhaust (g/mi)**	**Start-Up (g/start)[a]**	**Tire Wear (g/mi)**	**Brake Wear (g/mi)**	**CO2**		CO	NOx	VOCs	SOx	PM10	CO2	CO2
					Running Exhaust (g/mi)	**Start-Up (g/start)[a]**	**Running Exhaust (g/mi)**	**Start-Up (g/start)[a]**							**Running Exhaust (g/mi)**	**Start-Up (g/start)[a]**					**Running Exhaust (g/mi)**	**Start-Up (g/start)[a]**									
Site Preparation and Grading	Light-duty truck, catalyst	80	33	36	3.344	11.04	0.358	0.514	0.121	0.827	0.235	0.029	0.054	0.06	0.004	0.002	0.013	0.016	0.008	0.013	397.826	194.666	***25.13***	***2.45***	***1.66***	***0.03***	***0.22***	***2594.60***	***1673.52***

Assume startup after 8 hours

Assume 45 minutes run time total
2010 Emission Factors from EMFAC2007

Table A-4
Architectural Coatings Emissions
Campus Park Project

Calculation Methodology - Table A11-13-D, SCAQMD CEQA Handbook

Assumptions

2000 square feet per residence
2.7 square feet of surface area to be coated per square foot of floor space

Residences	Square Fe	Square Feet - Coated Surface Area	Emission Factor for ROC, lbs/1000 square feet	Total Emis	Daily Emissions, lbs/day
1076	2000	5810400	4.62	13.42	43.02

Assuming Electrostatic sprayguns, brush

Assumptions

2.0 square feet of surface area to be coated per square foot of floor space

Square Feet - Coated Surface Area	Emission Factor for ROC, lbs/1000 square feet	Total Emis	Daily Emissions, lbs/day
300000	4.62	0.69	26.65

Assuming Electrostatic sprayguns, brush

Table A-5
Construction Health Risk Calculations
Campus Park Project

Phase	Total Days	lbs total	grams/sec	Impact ug/m3	Risk
1	180	2990.76	0.043017	1.46E-01	3.09E-07
2	180	263.94	0.003796	1.29E-02	2.73E-08
3	180	1221.37	0.017567	5.97E-02	1.26E-07
House	500	555.39	0.007988	2.71E-02	1.59E-07
Commercia	250	318.16	0.004576	1.56E-02	4.57E-08

Risk, Phases 1-3	4.62E-07
Risk, Phases 4 and 5	2.05E-07
Total Risk	6.67E-07

Maximum Impacts in ug/m3 at MEI (based on 1 gram/second emission rate)

All Source	Source 1	Source 2	Source 3	Source 4	Source 5
16.99259	1.50003	2.02548	2.14849	3.91872	7.39987

Table A-6
Project-Related Traffic Emissions
Campus Park Project

External Trips

Emissions, lbs/day

Vehicle Class	Number of Daily Trips	Speed (mph)	VMT (mi/vehicle-day)	CO Running Exhaust (g/mi)	CO Start-Up (g/start)[a]	NO_x Running Exhaust (g/mi)	NO_x Start-Up (g/start)[a]	VOCs Running Exhaust (g/mi)	VOCs Start-Up (g/start)[a]	VOCs Hot-Soak (g/trip)	VOCs Resting Loss (g/hr)	VOCs Running Evaporative (g/mi)	VOCs Diurnal Evaporative (g/hr)	SO_x Running Exhaust (g/mi)	SO_x Start-Up (g/start)[a]	PM10 Running Exhaust (g/mi)	PM10 Start-Up (g/start)[a]	PM10 Tire Wear (g/mi)	PM10 Brake Wear (g/mi)	Emissions, lbs/day CO	NOx	VOCs	SOx	PM10	Emissions, tons/year CO	NOx	VOCs	SOx	PM10
Light-duty auto	10888	33	17.1	1.854	7.726	0.183	0.367	0.052	0.641	0.2	0.023	0.028	0.049	0.003	0.002	0.011	0.016	0.008	0.013	946.47	83.93	72.55	1.2794	13.52	172.73	15.32	13.24	0.2335	2.4672
Light-duty truck	3071	33	17.1	2.071	7.669	0.202	0.352	0.053	0.529	0.212	0.026	0.04	0.048	0.004	0.002	0.013	0.017	0.008	0.013	291.69	25.77	20.52	0.4766	4.05	53.23	4.70	3.75	0.0870	0.7394
	13959																												
																			Totals	**1238.16**	**109.69**	**93.07**	**1.76**	**17.57**	**225.96**	**20.02**	**16.98**	**0.32**	**3.21**

Assuming 2015 Emission Factors, EMFAC2007, startup after 8 hours

Emissions, lbs/day | Emissions, tons/year

Vehicle Class	Number of Daily Trips	Speed (mph)	VMT (mi/vehicle-day)	CO Running Exhaust (g/mi)	CO Start-Up (g/start)[a]	NO_x Running Exhaust (g/mi)	NO_x Start-Up (g/start)[a]	VOCs Running Exhaust (g/mi)	VOCs Start-Up (g/start)[a]	VOCs Hot-Soak (g/trip)	VOCs Resting Loss (g/hr)	VOCs Running Evaporative (g/mi)	VOCs Diurnal Evaporative (g/hr)	SO_x Running Exhaust (g/mi)	SO_x Start-Up (g/start)[a]	PM10 Running Exhaust (g/mi)	PM10 Start-Up (g/start)[a]	PM10 Tire Wear (g/mi)	PM10 Brake Wear (g/mi)	Emissions, lbs/day CO	NOx	VOCs	SOx	PM10	Emissions, tons/year CO	NOx	VOCs	SOx	PM10
Light-duty auto	10888	33	17.1	0.818	2.878	0.089	0.098	0.027	0.231	0.058	0.007	0.011	0.013	0.003	0.002	0.01	0.015	0.008	0.013	404.85	38.88	27.02	1.2794	13.08	73.88	7.10	4.93	0.2335	2.3879
Light-duty truck	3071	33	17.1	0.552	1.571	0.039	0.044	0.006	0.073	0.058	0.009	0.012	0.012	0.004	0.002	0.012	0.017	0.008	0.013	74.54	4.81	4.26	0.4766	3.94	13.60	0.88	0.78	0.0870	0.7183
	13959																												
																			Totals	**479.39**	**43.70**	**31.28**	**1.76**	**17.02**	**87.49**	**7.97**	**5.71**	**0.32**	**3.11**

Assuming 2040 Emission Factors, EMFAC2007, startup after 8 hours

Internal Trips

Vehicle Class	Number of Daily Trips	Speed (mph)	VMT (mi/vehicle-day)	CO Running Exhaust (g/mi)	CO Start-Up (g/start)[a]	NO_x Running Exhaust (g/mi)	NO_x Start-Up (g/start)[a]	VOCs Running Exhaust (g/mi)	VOCs Start-Up (g/start)[a]	VOCs Hot-Soak (g/trip)	VOCs Resting Loss (g/hr)	VOCs Running Evaporative (g/mi)	VOCs Diurnal Evaporative (g/hr)	SO_x Running Exhaust (g/mi)	SO_x Start-Up (g/start)[a]	PM10 Running Exhaust (g/mi)	PM10 Start-Up (g/start)[a]	PM10 Tire Wear (g/mi)	PM10 Brake Wear (g/mi)	Emissions, lbs/day CO	NOx	VOCs	SOx	PM10	Emissions, tons/year CO	NOx	VOCs	SOx	PM10
Light-duty auto	4666	33	0.5	1.854	7.726	0.183	0.367	0.052	0.641	0.2	0.023	0.028	0.049	0.003	0.002	0.011	0.016	0.008	0.013	89.01	4.72	22.21	0.0360	0.33	16.24	0.86	4.05	0.0066	0.0601
Light-duty truck	1316	33	0.5	2.071	7.669	0.202	0.352	0.053	0.529	0.212	0.026	0.04	0.048	0.004	0.002	0.013	0.017	0.008	0.013	25.26	1.31	6.24	0.0116	0.10	4.61	0.24	1.14	0.0021	0.0180
	5982																												
																			Totals	**114.27**	**6.03**	**28.45**	**0.05**	**0.43**	**20.85**	**1.10**	**5.19**	**0.01**	**0.08**

Assuming 2015 Emission Factors, EMFAC2007, startup after 1 hour

Vehicle Class	Number of Daily Trips	Speed (mph)	VMT (mi/vehicle-day)	CO Running Exhaust (g/mi)	CO Start-Up (g/start)[a]	NO_x Running Exhaust (g/mi)	NO_x Start-Up (g/start)[a]	VOCs Running Exhaust (g/mi)	VOCs Start-Up (g/start)[a]	VOCs Hot-Soak (g/trip)	VOCs Resting Loss (g/hr)	VOCs Running Evaporative (g/mi)	VOCs Diurnal Evaporative (g/hr)	SO_x Running Exhaust (g/mi)	SO_x Start-Up (g/start)[a]	PM10 Running Exhaust (g/mi)	PM10 Start-Up (g/start)[a]	PM10 Tire Wear (g/mi)	PM10 Brake Wear (g/mi)	Emissions, lbs/day CO	NOx	VOCs	SOx	PM10	Emissions, tons/year CO	NOx	VOCs	SOx	PM10
Light-duty auto	4666	33	0.5	0.818	2.878	0.089	0.098	0.027	0.231	0.058	0.007	0.011	0.013	0.003	0.002	0.01	0.015	0.008	0.013	33.81	1.47	6.97	0.0360	0.31	6.17	0.27	1.27	0.0066	0.0573
Light-duty truck	1316	33	0.5	0.552	1.571	0.039	0.044	0.006	0.073	0.058	0.009	0.012	0.012	0.004	0.002	0.012	0.017	0.008	0.013	5.36	0.18	1.54	0.0116	0.10	0.98	0.03	0.28	0.0021	0.0177
	5982																												
																			Totals	**39.17**	**1.65**	**8.51**	**0.05**	**0.41**	**7.15**	**0.30**	**1.55**	**0.01**	**0.07**

Assuming 2040 Emission Factors, EMFAC2007, startup after 1 hour

Total GHG Emissions
Total CO2 Eq, metric to

Road Dust

Road Dust PM10

Emission Factor, lb/VMT	K	SL	W	C	P
9.68635E-05	0.016	0.0285	2.077	0.00047	40

	lbs/day	tons/year
External Trips	23.12	4.22
Internal Trips	0.29	0.05

Vehicle Weights	Weight	Fraction	
LDA	2	0.467	0.934
LDT1	2.35	0.086	0.2021
	2.077		

Table A-7
Project-Related Diesel Particulate Emissions
Campus Park Project

Vehicle Class	Number of Daily Trips Attributable to Residential/Commercial	Speed (mph)	VMT (mi/vehicle-day)	PM10 Running Exhaust (g/mi)	Emissions, PM10
Light-duty auto, diesel	22	33	1.6	0.011	***0.00086***
Light-duty truck,diesel	16	33	1.6	0.013	***0.00071***
	38				
			Total		**0.00157**

Vehicle Class	Number of Daily Trips Attributable to Internal Trips	Speed (mph)	VMT (mi/vehicle-day)	PM10 Running Exhaust (g/mi)	Emissions, PM10
Light-duty auto, diesel	9	33	0.43	0.026	***0.00023***
Light-duty truck,diesel	7	33	0.43	0.026	***0.00016***
	16				
			Total		**0.00040**

ISCST3 Output Files were submitted and reviewed by the County and are available upon request.

HARP Outputs – Operational Risk Assessment

```
This file: c:\HARPExpress\PerrisBusiness\Rep01_Can_70yr_Avg_AllRec_AllSrc_AllCh_ByRec_Site.txt

Created by HARP Version 1.0  Build 23.02.21
Uses ISC Version 99155
Uses BPIP Version 95086
Creation date: 5/16/2008 5:04:43 PM


EXCEPTION REPORT
   (there have been no changes or exceptions)

INPUT FILES:
   Source-Receptor file: c:\HARPExpress\CAMPPK.mta
   Averaging period adjustment factors file: not applicable
   Emission rates file: none
   Site parameters file: c:\HARPExpress\demo.sit


Screening mode is OFF

Exposure duration: 70 year (adult resident)
Analysis method:   Average Point Estimate
Health effect:     Cancer Risk
Receptor(s):       All
Sources(s):        All
Chemicals(s):      All

SITE PARAMETERS

DEPOSITION

   Deposition rate (m/s)            0.05

DRINKING WATER

   Water surface area (m^2)         1001
   Water volume (L)                 10000000
   Volume changes per year          1
   Fraction of drinking water
     from contaminated source       1

FISH

   Water surface area (m^2)         1000
   Water volume (L)                 10000000
   Volume changes per year          1
   Fraction of ingested fish
```

```
     from contaminated source        1

PASTURE

   ANIMALS' WATER
   Water surface area (m^2)          1000
   Water volume (L)                  10000000
   Volume changes per year           1
   Fraction of beef cows' water
     from pasture source             1
   Fraction of dairy cows' water
     from pasture source             1

   ANIMALS' FEED
   Fraction of cows' feed
     from grazing                    1

   HUMAN INGESTION
   Fraction of ingested beef
     from contaminated source        1
   Fraction of ingested dairy
     from contaminated source        1

HOME GROWN PRODUCE

   HUMAN INGESTION
   Fraction of ingested leafy vegetable
     from home grown source          0.15
   Fraction of ingested exposed vegetable
     from home grown source          0.15
   Fraction of ingested protected vegetable
     from home grown source          0.15
   Fraction of ingested root vegetable
     from home grown source          0.15

PIGS, CHICKENS AND EGGS

   HUMAN INGESTION
   Fraction of ingested pig
     from home grown source          1
   Fraction of ingested chicken
     from home grown source          1
   Fraction of ingested egg
     from home grown source          1

   ANIMALS' FEED
   Fraction of pigs' feed
     from home grown crop            0.1
   Fraction of chickens' feed
     from home grown crop            0.05
```

```
   SOIL INGESTION
   Fraction of pigs' feed
     eaten off the ground            0.1
   Fraction of chickens' feed
     eaten off the ground            0.05

   PIG FEED COMPOSITION
   Fraction of feed that is
     exposed vegetable               0.25
   Fraction of feed that is
     leafy vegetable                 0.25
   Fraction of feed that is
     protected vegetable             0.25
   Fraction of feed that is
     root vegetable                  0.25

   CHICKEN FEED COMPOSITION
   Fraction of feed that is
     exposed vegetable               0.25
   Fraction of feed that is
     leafy vegetable                 0.25
   Fraction of feed that is
     protected vegetable             0.25
   Fraction of feed that is
     root vegetable                  0.25

DERMAL ABSORPTION

*** Pathway enabled ***

SOIL INGESTION

*** Pathway enabled ***

MOTHER'S MILK

*** Pathway enabled ***



CHEMICAL CROSS-REFERENCE TABLE AND BACKGROUND CONCENTRATIONS
CHEM  CAS        ABBREVIATION    POLLUTANT NAME                                                    BACKGROUND (ug/m^3)
0001  9901       DieselExhPM     Diesel engine exhaust, particulate matter                         0.000E+00

EMISSIONS DATA SOURCE:
CHEMICALS ADDED OR DELETED: none

EMISSIONS FOR FACILITY FAC=FAC1   CO=*   DEV=PR1   PRO=STK1   STK=1   NAME=Facility 1  EMS (lbs/yr)
SOURCE MULTIPLIER=1
CAS             ABBREV               MULTIPLIER     BG (ug/m^3)   AVRG (lbs/yr)    MAX (lbs/hr)
9901            DieselExhPM                   1               0         0.00906       0.0000159
```

```
EMISSIONS FOR FACILITY FAC=FAC1   CO=*   DEV=PR2   PRO=STK2   STK=1   NAME=Facility 1  EMS (lbs/yr)
SOURCE MULTIPLIER=1
CAS             ABBREV               MULTIPLIER     BG (ug/m^3)   AVRG (lbs/yr)    MAX (lbs/hr)
9901            DieselExhPM                   1               0         0.00906       0.0000159

EMISSIONS FOR FACILITY FAC=FAC1   CO=*   DEV=PR3   PRO=STK3   STK=1   NAME=Facility 1  EMS (lbs/yr)
SOURCE MULTIPLIER=1
CAS             ABBREV               MULTIPLIER     BG (ug/m^3)   AVRG (lbs/yr)    MAX (lbs/hr)
9901            DieselExhPM                   1               0         0.00906       0.0000159

EMISSIONS FOR FACILITY FAC=FAC1   CO=*   DEV=PR4   PRO=STK4   STK=1   NAME=Facility 1  EMS (lbs/yr)
SOURCE MULTIPLIER=1
CAS             ABBREV               MULTIPLIER     BG (ug/m^3)   AVRG (lbs/yr)    MAX (lbs/hr)
9901            DieselExhPM                   1               0         0.00906       0.0000159

EMISSIONS FOR FACILITY FAC=FAC1   CO=*   DEV=PR5   PRO=STK5   STK=1   NAME=Facility 1  EMS (lbs/yr)
SOURCE MULTIPLIER=1
CAS             ABBREV               MULTIPLIER     BG (ug/m^3)   AVRG (lbs/yr)    MAX (lbs/hr)
9901            DieselExhPM                   1               0         0.00906       0.0000159

EMISSIONS FOR FACILITY FAC=FAC1   CO=*   DEV=pr6   PRO=STK6   STK=1   NAME=Facility 1  EMS (lbs/yr)
SOURCE MULTIPLIER=1
CAS             ABBREV               MULTIPLIER     BG (ug/m^3)   AVRG (lbs/yr)    MAX (lbs/hr)
9901            DieselExhPM                   1               0         0.00906       0.0000159

EMISSIONS FOR FACILITY FAC=FAC1   CO=*   DEV=PR7   PRO=STK7   STK=1   NAME=Facility 1  EMS (lbs/yr)
SOURCE MULTIPLIER=1
CAS             ABBREV               MULTIPLIER     BG (ug/m^3)   AVRG (lbs/yr)    MAX (lbs/hr)
9901            DieselExhPM                   1               0         0.00906       0.0000159

EMISSIONS FOR FACILITY FAC=FAC1   CO=*   DEV=PR8   PRO=STK8   STK=1   NAME=Facility 1  EMS (lbs/yr)
SOURCE MULTIPLIER=1
CAS             ABBREV               MULTIPLIER     BG (ug/m^3)   AVRG (lbs/yr)    MAX (lbs/hr)
9901            DieselExhPM                   1               0         0.00906       0.0000159

EMISSIONS FOR FACILITY FAC=FAC1   CO=*   DEV=PR9   PRO=STK9   STK=1   NAME=Facility 1  EMS (lbs/yr)
SOURCE MULTIPLIER=1
CAS             ABBREV               MULTIPLIER     BG (ug/m^3)   AVRG (lbs/yr)    MAX (lbs/hr)
9901            DieselExhPM                   1               0         0.00906       0.0000159

EMISSIONS FOR FACILITY FAC=FAC1   CO=*   DEV=PR10   PRO=STK10   STK=1   NAME=Facility 1  EMS (lbs/yr)
SOURCE MULTIPLIER=1
CAS             ABBREV               MULTIPLIER     BG (ug/m^3)   AVRG (lbs/yr)    MAX (lbs/hr)
9901            DieselExhPM                   1               0         0.00906       0.0000159

EMISSIONS FOR FACILITY FAC=FAC1   CO=*   DEV=PR11   PRO=STK11   STK=1   NAME=Facility 1  EMS (lbs/yr)
SOURCE MULTIPLIER=1
CAS             ABBREV               MULTIPLIER     BG (ug/m^3)   AVRG (lbs/yr)    MAX (lbs/hr)
9901            DieselExhPM                   1               0         0.00906       0.0000159
```

EMISSIONS FOR FACILITY FAC=FAC1 CO=* DEV=PR12 PRO=STK12 STK=1 NAME=Facility 1 EMS (lbs/yr)
SOURCE MULTIPLIER=1

CAS	ABBREV	MULTIPLIER	BG (ug/m^3)	AVRG (lbs/yr)	MAX (lbs/hr)
9901	DieselExhPM	1	0	0.00906	0.0000159

EMISSIONS FOR FACILITY FAC=FAC1 CO=* DEV=PR13 PRO=STK13 STK=1 NAME=Facility 1 EMS (lbs/yr)
SOURCE MULTIPLIER=1

CAS	ABBREV	MULTIPLIER	BG (ug/m^3)	AVRG (lbs/yr)	MAX (lbs/hr)
9901	DieselExhPM	1	0	0.00906	0.0000159

EMISSIONS FOR FACILITY FAC=FAC1 CO=* DEV=PR14 PRO=STK14 STK=1 NAME=Facility 1 EMS (lbs/yr)
SOURCE MULTIPLIER=1

CAS	ABBREV	MULTIPLIER	BG (ug/m^3)	AVRG (lbs/yr)	MAX (lbs/hr)
9901	DieselExhPM	1	0	0.00906	0.0000159

CANCER RISK REPORT

REC	INHAL	DERM	SOIL	MOTHER	FISH	WATER	VEG	DAIRY	BEEF	CHICK	PIG	EGG	MEAT	ORAL	TOTAL
0001	2.70E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.70E-10
0002	4.93E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.93E-10
0003	2.45E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.45E-09
0004	1.97E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.97E-09
0005	5.21E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.21E-09
0006	8.04E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.04E-09
0007	2.02E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.02E-08
0008	1.07E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.07E-08
0009	2.79E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.79E-09
0010	5.95E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.95E-09
0011	1.25E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.25E-09
0012	1.10E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.10E-09
0013	2.43E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.43E-09
0014	2.41E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.41E-09
0015	1.58E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.58E-09
0016	1.60E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.60E-09
2.15E-09															

3/10/2009 8:30:29 PM

Urbemis 2007 Version 9.2.4

Combined Summer Emissions Reports (Pounds/Day)

File Name: C:\Urbemis\Urbemis 9.2.2\Projects\Campus Park.urb924

Project Name: Campus Park Area Sources

Project Location: California State-wide

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

AREA SOURCE EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (lbs/day, unmitigated)	17.93	12.67	33.83	0.00	0.10	0.10	15,688.92
TOTALS (lbs/day, mitigated)	12.11	10.20	32.64	0.00	0.10	0.10	12,560.29
Percent Reduction	32.46	19.49	3.52	NaN	0.00	0.00	19.94

SUM OF AREA SOURCE AND OPERATIONAL EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (lbs/day, unmitigated)	17.93	12.67	33.83	0.00	0.10	0.10	15,688.92

Both Area and Operational Mitigation must be turned on to get a combined mitigated total.

3/10/2009 8:30:29 PM

Area Source Unmitigated Detail Report:

AREA SOURCE EMISSION ESTIMATES Summer Pounds Per Day, Unmitigated

Source	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
Natural Gas	0.95	12.35	5.94	0.00	0.02	0.02	15,643.15
Hearth - No Summer Emissions							
Landscape	4.57	0.32	27.89	0.00	0.08	0.08	45.77
Consumer Products							
Architectural Coatings	12.41						
TOTALS (lbs/day, unmitigated)	17.93	12.67	33.83	0.00	0.10	0.10	15,688.92

Area Source Mitigated Detail Report:

AREA SOURCE EMISSION ESTIMATES Summer Pounds Per Day, Mitigated

Source	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
Natural Gas	0.76	9.88	4.75	0.00	0.02	0.02	12,514.52
Hearth - No Summer Emissions							
Landscape	4.57	0.32	27.89	0.00	0.08	0.08	45.77
Consumer Products							
Architectural Coatings	6.78						
TOTALS (lbs/day, mitigated)	12.11	10.20	32.64	0.00	0.10	0.10	12,560.29

Area Source Changes to Defaults

Percentage of residences with wood stoves changed from 35% to 0%

Percentage of residences with wood fireplaces changed from 10% to 0%

Percentage of residences with natural gas fireplaces changed from 55% to 100%

3/10/2009 8:31:01 PM

Urbemis 2007 Version 9.2.4

Combined Winter Emissions Reports (Pounds/Day)

File Name: C:\Urbemis\Urbemis 9.2.2\Projects\Campus Park.urb924

Project Name: Campus Park Area Sources

Project Location: California State-wide

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

AREA SOURCE EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (lbs/day, unmitigated)	13.79	19.74	9.08	0.05	0.62	0.61	25,077.27
TOTALS (lbs/day, mitigated)	7.97	17.27	7.89	0.05	0.62	0.61	21,948.64
Percent Reduction	42.20	12.51	13.11	0.00	0.00	0.00	12.48

SUM OF AREA SOURCE AND OPERATIONAL EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (lbs/day, unmitigated)	13.79	19.74	9.08	0.05	0.62	0.61	25,077.27

Both Area and Operational Mitigation must be turned on to get a combined mitigated total.

3/10/2009 8:31:01 PM

Area Source Unmitigated Detail Report:

AREA SOURCE EMISSION ESTIMATES Winter Pounds Per Day, Unmitigated

Source	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
Natural Gas	0.95	12.35	5.94	0.00	0.02	0.02	15,643.15
Hearth	0.43	7.39	3.14	0.05	0.60	0.59	9,434.12
Landscaping - No Winter Emissions							
Consumer Products							
Architectural Coatings	12.41						
TOTALS (lbs/day, unmitigated)	13.79	19.74	9.08	0.05	0.62	0.61	25,077.27

Area Source Mitigated Detail Report:

AREA SOURCE EMISSION ESTIMATES Winter Pounds Per Day, Mitigated

Source	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
Natural Gas	0.76	9.88	4.75	0.00	0.02	0.02	12,514.52
Hearth	0.43	7.39	3.14	0.05	0.60	0.59	9,434.12
Landscaping - No Winter Emissions							
Consumer Products							
Architectural Coatings	6.78						
TOTALS (lbs/day, mitigated)	7.97	17.27	7.89	0.05	0.62	0.61	21,948.64

Area Source Changes to Defaults

Percentage of residences with wood stoves changed from 35% to 0%

Percentage of residences with wood fireplaces changed from 10% to 0%

Percentage of residences with natural gas fireplaces changed from 55% to 100%

3/10/2009 8:31:25 PM

Urbemis 2007 Version 9.2.4

Combined Annual Emissions Reports (Tons/Year)

File Name: C:\Urbemis\Urbemis 9.2.2\Projects\Campus Park.urb924

Project Name: Campus Park Area Sources

Project Location: California State-wide

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

AREA SOURCE EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (tons/year, unmitigated)	2.85	2.28	3.59	0.00	0.01	0.01	2,863.72
TOTALS (tons/year, mitigated)	1.79	1.83	3.38	0.00	0.01	0.01	2,292.74
Percent Reduction	37.19	19.74	5.85	NaN	0.00	0.00	19.94

SUM OF AREA SOURCE AND OPERATIONAL EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (tons/year, unmitigated)	2.85	2.28	3.59	0.00	0.01	0.01	2,863.72

Both Area and Operational Mitigation must be turned on to get a combined mitigated total.

3/10/2009 8:31:25 PM

Area Source Unmitigated Detail Report:

AREA SOURCE EMISSION ESTIMATES Annual Tons Per Year, Unmitigated

Source	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
Natural Gas	0.17	2.25	1.08	0.00	0.00	0.00	2,854.88
Hearth	0.00	0.00	0.00	0.00	0.00	0.00	4.72
Landscape	0.41	0.03	2.51	0.00	0.01	0.01	4.12
Consumer Products							
Architectural Coatings	2.27						
TOTALS (tons/year, unmitigated)	2.85	2.28	3.59	0.00	0.01	0.01	2,863.72

Area Source Mitigated Detail Report:

AREA SOURCE EMISSION ESTIMATES Annual Tons Per Year, Mitigated

Source	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
Natural Gas	0.14	1.80	0.87	0.00	0.00	0.00	2,283.90
Hearth	0.00	0.00	0.00	0.00	0.00	0.00	4.72
Landscape	0.41	0.03	2.51	0.00	0.01	0.01	4.12
Consumer Products							
Architectural Coatings	1.24						
TOTALS (tons/year, mitigated)	1.79	1.83	3.38	0.00	0.01	0.01	2,292.74

Area Source Changes to Defaults

Percentage of residences with wood stoves changed from 35% to 0%

Percentage of residences with wood fireplaces changed from 10% to 0%

Percentage of residences with natural gas fireplaces changed from 55% to 100%

GLOBAL CLIMATE CHANGE EVALUATION

Global Climate Change Evaluation

for the

Campus Park (Passerelle) Specific Plan

GPA 03-04,
SP 03-008,
R 03-014,
TM 5338RPL,
ER 03-02-059

Submitted To:

Passerelle, LLC
402 W. Broadway, Suite 1320
San Diego, CA 92101

Prepared By:

Scientific Resources Associated
1328 Kaimalino Lane
San Diego, CA 92109

July 8, 2009

Prepared By: _____

Valorie L. Thompson, Ph.D.
Principal

Table of Contents

List of Acronyms

APCD	Air Pollution Control District
AB	Assembly Bill
AB 32	Assembly Bill 32, Global Warming Solutions Act of 2006
ARB	Air Resources Board
ASTM	American Society of Testing and Materials
CAPCOA	California Air Pollution Control Officers Association
CAT	Climate Action Team
CCAP	Center for Clean Air Policy
CCAR	California Climate Action Registry
CEC	California Energy Commission
CEQA	California Environmental Quality Act
CH_4	Methane
CO	Carbon Monoxide
CO_2	Carbon Dioxide
CO_2e	Carbon Dioxide Equivalent
DWR	Department of Water Resources
EIR	Environmental Impact Report
EPA	U.S. Environmental Protection Agency
EV	Electric Vehicles
GCC	Global Climate Change
GHG	Greenhouse Gas
GGEP	Greenhouse Gas Emissions Policy
GGRP	Greenhouse Gas Reduction Plan
GP	General Plan
GWP	Global Warming Potential
HFCs	Hydrofluorocarbons
IPCC	Intergovernmental Panel on Climate Change
LEED	Leadership in Energy and Environmental Design
MMT	Million Metric Tons
MW	Megawatts
N_2O	Nitrous Oxide
NOx	Oxides of Nitrogen
OPR	State Office of Planning and Research
PFCs	Perfluorocarbons
PM	Particulate Matter
ROG	Reactive Organic Gas
RPS	Renewable Portfolio Standards
S-3-05	Executive Order S-3-05
SB	Senate Bill
SDCGHGI	San Diego County Greenhouse Gas Inventory
SRI	Solar Reflective Index
THC	Total Hydrocarbon
UNFCCC	United Nations Framework Convention on Climate Change
URBEMIS	Urban Emissions Model

USBGC	U.S. Green Building Council
VMT	Vehicle Miles Traveled

Executive Summary

This report presents an assessment of potential global climate change impacts associated with the proposed Campus Park Specific Plan Project. The evaluation addresses the potential for greenhouse gas emissions during construction and after full buildout of the project.

GHG emissions have been calculated for business as usual conditions and for conditions with implementation of GHG emission reduction measures proposed by the Project applicant. A summary of the emission calculations is provided in Table ES-1. As shown in Table ES-1, with implementation of GHG emission reduction measures, the project would meet the goals of AB 32. Because the Campus Park Project would reduce GHG emissions by more than 25% below business as usual, the project conforms with the goals of AB 32. The Project would therefore not result in any direct impacts to the global climate, and cumulative impacts would be reduced to a level that is less than significant.

Table ES-1 SUMMARY OF ESTIMATED OPERATIONAL GREENHOUSE GAS EMISSIONS			
Business as Usual			
Emission Source	**Annual Emissions (Metric tons/year)**		
	CO_2	**CH_4**	**N_2O**
Operational Emissions			
Electricity Use Emissions	3,677	0.028	0.015
Natural Gas Use Emissions	1,416	0.016	0.003
Water Consumption Emissions	715	0.005	0.003
Vehicle Emissions	30,956	2	2
Total	36,764	2.05	2.02
Global Warming Potential Factor	**1**	**21**	**310**
CO_2 Equivalent Emissions	36,764	43	627
TOTAL CO_2 Equivalent Emissions	**37,434**		
With GHG Reduction Measures			
Electricity Use Emissions	2,647	0.020	0.011
Natural Gas Use Emissions	1,133	0.13	0.0021
Water Consumption Emissions	629	0.005	0.003
Vehicle Emissions[a]	19,812	1.3	1.3
Total	24,221	1.4	1.3
Global Warming Potential Factor	**1**	**21**	**310**
CO_2 Equivalent Emissions	24,221	29	403
TOTAL CO_2 Equivalent Emissions	**24,653**		
Percent Reduction from Business As Usual	**34%**		

[a]Accounting for reductions estimated through state vehicle emission reduction programs amounting to 28% reduction in GHG, and through mixed-use development goals and bicycle/pedestrian access, assumed to reduce vehicle emissions by an additional 8% based on URBEMIS Model assumptions.

1.0 INTRODUCTION

This report presents an assessment of potential global climate change impacts associated with the proposed Campus Park Specific Plan Project. The evaluation addresses the potential for greenhouse gas emissions during construction and after full buildout of the project.

The Project proposes on-site construction of a mixed-use community. The development would include a total of 1,076 single- and multi-family homes, commercial uses, and professional office uses, as well as parks, a Homeowner's Association (HOA) recreational facility, a Town Center (with retail and support services), and designated open space and biological open space preserves. The infrastructure necessary to support the development would include on- and off-site roadways, sewer and water facilities, and storm drains, as well as support for non-vehicular modes of transportation via bikeways and pedestrian paths.

The Proposed Project would include 521 single-family dwelling units and 555 multi-family dwelling units. Single-family residential units would be located in the northern portion of the site, and multi-family housing would be located in the central southeastern areas, on either side of Horse Ranch Creek Road, as well as abutting SR 76. Professional office buildings, an active sports complex, and a Town Center would be aligned (north to south) along the western edge of the northern portion of the Project site, bordered on the west by Horse Ranch Creek Road. Preserved coastal sage scrub habitat would abut most of the northern portion of the Proposed Project to the west, north, and east. The southern portion of the Project would include mostly preserved riparian habitat.

The Town Center would be constructed in the central portion of the Project site on the east side of Horse Ranch Creek Road. A total building square footage of 61,200 would be allowed in the planning area. The Town Center would include numerous structures, as well as a parking area. Community-serving uses in Campus Park would be concentrated in the Town Center core area, which would function as the social, commercial and activity center for the community. The Town Center would include a variety of social, civic and commercial uses within the Proposed

Project, such as community-serving commercial retail shops and services, restaurants, offices, a post office, sheriff substation and library. Structures would not exceed two stories.

Four office professional lots are proposed for the development and would be located on the east side on Horse Ranch Creek Road on either side of Baltimore Oriole Road. In addition to administrative and professional services, office uses could include financial and real estate services, medical offices, schools, civic uses, day care and eating establishments. A total building square footage of approximately 157,000 would be allowed on these lots. Office professional uses would not exceed two stories.

The Proposed Project would include two wastewater management design options, only one of which would be implemented. Under both options, sewage would be collected from the Project site via 10- and 15- inch diameter pipelines beneath roadways. The sewage would flow to the southern portion of the site to a proposed sewer lift station to be located on the west side of Pala Mesa Drive east of the proposed trail staging area. Sewage would then be carried off-site through an existing 12-inch diameter force main.

Under Wastewater Management Option 1, all Project sewage would flow from the force main to infrastructure owned and operated by Rainbow Municipal Water District. Under Wastewater Management Option 2, sewage from 850 Equivalent Dwelling Units (EDUs) would be sent to Rainbow Municipal Water District for Treatment, with the remainder to be treated at a new wastewater treatment plant (WTP) to be built by others and to be located within the service area of Valley Center Municipal Water District. An inter-district agreement would be required between the two water districts. Under Option 2, a storage pond adequate to contain 84 days of wet-weather storage (to store treated effluent during days when irrigation would result in runoff) would be constructed within the south-eastern portion of the Project site. Reclaimed water pipelines would be constructed from the off-site WTP, within Horse Ranch Creek Road, and would cross a small portion of the western-most portion of the proposed abutting Meadowood Project in order to reach the containment basin.

Existing vegetation on site would be retained within dedicated biological open space preserves. Coastal sage scrub-covered slopes would be preserved in the north, northwestern and northeastern portions of the site, while riparian areas would be preserved along the southwestern boundary of the property. Additional acreage (fuel management zones and interior landscaped slopes) would be designated as open space for HOA maintenance, otherwise known as common open space. In addition, six neighborhood parks and an HOA recreation/community facility—including a pool and a small picnic area/barbecue—would serve local residents. An 8.6-acre active sports park would be located along Horse Ranch Creek Road. The park would include two baseball fields—one overlapping with a soccer/multi-purpose field—a restroom/maintenance building and parking.

A trail system consisting of community trails and nature trails would be provided throughout the Project site. Community trails, to be constructed within the development footprint, would allow pedestrians to connect to the various open space and park areas on the Project site. Nature trails would be provided in the northern area. The trails would be eight feet wide with a soft surface and adjacent rail fence, where needed for safety. The trails would extend around the perimeter of the northern area, connecting to the off-site Monserate Mountain trail to the north and east. The Monserate Mountain hiking trail, located within the Fallbrook Conservancy Preserve, currently extends from the existing Pankey Road (north extension) through the undeveloped area north of the Project site to the east side of the Project site. This trail would connect on either end to the community trail system. The majority of trails would occur in already existing trails or dirt roads.

Several new roadways would be constructed to provide access to the Project's neighborhoods. Horse Ranch Creek Road would provide the primary entrance to the Project site and access to the majority of the development. This road would extend north from SR 76, ultimately connecting with the existing northern portion of Pankey Road. Secondary street access would be provided from the south via Pala Mesa Drive, which would extend northwest from Pankey Place, and ultimately connect to Old Highway 395 west of I-15 via an existing, currently unused bridge. Other roads would serve the residential areas. All roads would have sidewalks (composed of either concrete or decomposed granite), landscape easements and lighting. Some roads would

include on-street parking; additional off-street parking lots would be provided within the professional office, Town Center, multi-family residential and park areas.

The Project would maintain a 200-foot vegetation management zone north and east of single-family residences in the northern and central portions of the site for fuel management and fire protection. A 125-foot-wide vegetation management zone would be maintained on the west side of single-family residences in the northern area and southeastern side of the single-family residences in the southern area. Excluding portions abutting Meadowood (if approved), a 125-foot-wide vegetation management zone also would be maintained along the southeastern side of PA MF-3, and along the eastern edge of PAs MF-2 and MF-4. A 100- to 125-foot-wide vegetation management zone would be required for the balance of the Project site, including any lots bordering natural open space areas, flammable vegetation, and parks without an internal defensible zone. Required 30-foot clearing along roadways would fall within proposed fuel modification zones. A 10-foot clearance would occur along either side of on-site trails within open space.

1.1 General Principles and Existing Conditions

GCC refers to changes in average climatic conditions on Earth as a whole, including temperature, wind patterns, precipitation and storms. Global temperatures are moderated by naturally occurring atmospheric gases, including water vapor, carbon dioxide (CO_2), methane (CH_4) and nitrous oxide (N_2O), which are known as greenhouse gases (GHGs). These gases allow solar radiation (sunlight) into the Earth's atmosphere, but prevent radiative heat from escaping, thus warming the Earth's atmosphere. Gases that trap heat in the atmosphere are often called greenhouse gases, analogous to a greenhouse. GHGs are emitted by both natural processes and human activities. The accumulation of GHGs in the atmosphere regulates the Earth's temperature. Without these natural GHGs, the Earth's temperature would be about 61º Fahrenheit cooler (California Environmental Protection Agency 2006). Emissions from human activities, such as electricity production and vehicle use, have elevated the concentration of these gases in the atmosphere.

GHGs have been at the center of a widely contested political, economic, and scientific debate surrounding GCC. Although the conceptual existence of GCC is generally accepted, the extent to which GHGs contribute to it remains a source of debate. The State of California has been at the forefront of developing solutions to address GCC. GCC refers to any significant change in measures of climate, such as average temperature, precipitation, or wind patterns over a period of time. GCC may result from natural factors, natural processes, and/or human activities that change the composition of the atmosphere and alter the surface and features of land.

Global climate change attributable to anthropogenic (human) emissions of GHGs (mainly CO_2, CH_4 and N_2O) is currently one of the most important and widely debated scientific, economic and political issues in the United States. Historical records indicate that global climate changes have occurred in the past due to natural phenomena (such as during previous ice ages). Some data indicate that the current global conditions differ from past climate changes in rate and magnitude.

The United Nations Intergovernmental Panel (Panel) on Climate Change constructed several emission trajectories of GHGs needed to stabilize global temperatures and climate change impacts. The Panel concluded that a stabilization of GHGs at 400 to 450 ppm CO_2 equivalent concentration is required to keep global mean warming below 35.6º Fahrenheit (2º Celsius), which is assumed to be necessary to avoid dangerous climate change (Association of Environmental Professionals 2007).

State law defines greenhouse gases as any of the following compounds: carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs) and sulfur hexafluoride (SF_6) (California Health and Safety Code Section 38505(g).) CO_2, followed by CH_4 and N_2O, are the most common GHGs that result from human activity.

1.2 Sources and Global Warming Potentials of GHG

The State of California GHG Inventory performed by the California Air Resources Board (ARB), compiled statewide anthropogenic GHG emissions and sinks. It includes estimates for CO_2, CH_4, N_2O, SF_6, HFCs, and PFCs. The current inventory covers the years 1990 to 2004, and is summarized in Table 1. Data sources used to calculate this GHG inventory include California and federal agencies, international organizations, and industry associations. The calculation methodologies are consistent with guidance from the Intergovernmental Panel on Climate Change (IPCC). The 1990 emissions level is the sum total of sources and sinks from all sectors and categories in the inventory. The inventory is divided into seven broad sectors and categories in the inventory. These sectors include: Agriculture; Commercial; Electricity Generation; Forestry; Industrial; Residential; and Transportation.

Table 1
State of California GHG Emissions by Sector

Sector	Total 1990 Emissions ($MMTCO_2e$)	Percent of Total 1990 Emissions	Total 2004 Emissions ($MMTCO_2e$)	Percent of Total 2004 Emissions
Agriculture	23.4	5%	27.9	6%
Commercial	14.4	3%	12.8	3%
Electricity Generation	110.6	26%	119.8	25%
Forestry (excluding sinks)	0.2	<1%	0.2	<1%
Industrial	103.0	24%	96.2	20%
Residential	29.7	7%	29.1	6%
Transportation	150.7	35%	182.4	38%
Forestry Sinks	(6.7)		(4.7)	

When accounting for GHGs, all types of GHG emissions are expressed in terms of CO_2 equivalents (CO_2e) and are typically quantified in metric tons (MT) or millions of metric tons (MMT).

GHGs have varying global warming potential (GWP). The GWP is the potential of a gas or aerosol to trap heat in the atmosphere; it is the "cumulative radiative forcing effect of a gas over a specified time horizon resulting from the emission of a unit mass of gas relative to a reference gas" (USEPA 2006). The reference gas for GWP is CO_2; therefore, CO_2 has a GWP of 1. The other main greenhouse gases that have been attributed to human activity include CH_4, which has a GWP of 21, and N_2O, which has a GWP of 310. Table 2 presents the GWP and atmospheric lifetimes of common GHGs.

Table 2

Global Warming Potentials and Atmospheric Lifetimes of GHGs

GHG	Formula	100-Year Global Warming Potential	Atmospheric Lifetime (Years)
Carbon Dioxide	CO_2	1	Variable
Methane	CH_4	21	12 ± 3
Nitrous Oxide	N_2O	310	120
Sulfur Hexafluoride	SF_6	23,900	3,200

Human-caused sources of CO_2 include combustion of fossil fuels (coal, oil, natural gas, gasoline and wood). Data from ice cores indicate that CO_2 concentrations remained steady prior to the current period for approximately 10,000 years. Concentrations of CO_2 have increased in the atmosphere since the industrial revolution.

CH_4 is the main component of natural gas and also arises naturally from anaerobic decay of organic matter. Human-caused sources of natural gas include landfills, fermentation of manure and cattle farming. Human-caused sources of N_2O include combustion of fossil fuels and industrial processes such as nylon production and production of nitric acid.

Other GHGs are present in trace amounts in the atmosphere and are generated from various industrial or other uses.

In addition to the State of California GHG Inventory, a more specific regional GHG inventory was prepared by the University of San Diego School of Law Energy Policy Initiative Center

(University of San Diego 2008). This San Diego County Greenhouse Gas Inventory (SDCGHGI) is a detailed inventory that takes into account the unique characteristics of the region in calculating emissions. The SDCGHGI calculated GHG emissions for 1990, 2006, and projected 2020 emissions. Based on this inventory and the emission projections for the region, the study found that emissions of GHGs must be reduced by 33 percent below business as usual in order for San Diego County to achieve 1990 emission levels by the year 2020. "Business as usual", or forecasted emissions, is defined as the emissions that would occur in the absence of AB 32's mandated reductions. Construction of buildings using Title 24 building standards or the County's 2006 building code would create "business as usual" emissions.

Areas where feasible reductions can occur and the strategies for achieving those reductions are outlined in the SDCGHGI. A summary of the various sectors that contribute GHG emissions in San Diego County for the year 2006 is provided in Table 3. Total GHGs in San Diego County are estimated at 34 $MMTCO_2e$.

Table 3
San Diego County 2006 GHG Emissions by Category

Sector	Total Emissions ($MMTCO_2e$)	Percent of Total Emissions
On-Road Transportation	16	46%
Electricity	9	25%
Natural Gas Consumption	3	9%
Civil Aviation	1.7	5%
Industrial Processes & Products	1.6	5%
Other Fuels/Other	1.1	4%
Off-Road Equipment & Vehicles	1.3	4%
Waste	0.7	2%
Agriculture/Forestry/Land Use	0.7	2%
Rail	0.3	1%
Water-Born Navigation	0.13	0.4%

The sources of GHG emissions, GWP, and atmospheric lifetime of GHGs are all important variables to be considered in the process of calculating CO_2e for discretionary land use projects that require a climate change analysis.

1.3 Regulatory Framework

All levels of government have some responsibility for the protection of air quality, and each level (Federal, State, and regional/local) has specific responsibilities relating to air quality regulation. GHG emissions and the regulation of GHGs is a relatively new component of air quality.

1.3.1 National and International Efforts

International and Federal legislation have been enacted to deal with GCC issues. In 1988, the United Nations and the World Meteorological Organization established the IPCC to assess the scientific, technical, and socioeconomic information relevant to understanding the scientific basis for human-induced climate change, its potential impacts, and options for adaptation and mitigation. The most recent reports of the IPCC have emphasized the scientific consensus that real and measurable changes to the climate are occurring, that they are caused by human activity, and that significant adverse impacts on the environment, the economy, and human health and welfare are unavoidable.

In October 1993, President Clinton announced his Climate Change Action Plan (CCAP), which had a goal of returning GHG emissions to 1990 levels by the year 2000. This was to be accomplished through 50 initiatives that relied on innovative voluntary partnerships between the private sector and government aimed at producing cost-effective reductions in GHG emissions. On March 21, 1994, the United States joined a number of countries around the world in signing the United Nations Framework Convention on Climate Change (UNFCCC). Under the Convention, governments agreed to gather and share information on GHG emissions, national policies, and best practices; launch national strategies for addressing GHG emissions and adapting to expected impacts, including the provision of financial and technological support to developing countries; and cooperate in preparing for adaptation to the impacts of GCC.

Recently, the United States Supreme Court declared in the court case of Massachusetts et al. vs. the Environmental Protection Agency et al., 549 C.S. 497 (2007) that the EPA does have the ability to regulate GHG emissions. In addition to the national and international efforts described above, many local jurisdictions have adopted climate change policies and programs.

1.3.2 State Regulations and Standards

The following subsections describe regulations and standards that have been adopted by the State of California to address GCC issues.

Assembly Bill 32, the California Global Warming Solutions Act of 2006. In September 2006, Governor Schwartzenegger signed California AB 32, the global warming bill, into law. AB 32 directs the ARB to do the following:

- Make publicly available a list of discrete early action GHG emission reduction measures that can be implemented prior to the adoption of the statewide GHG limit and the measures required to achieve compliance with the statewide limit.
- Make publicly available a GHG inventory for the year 1990 and determine target levels for 2020.
- On or before January 1, 2010, adopt regulations to implement the early action GHG emission reduction measures.
- On or before January 1, 2011, adopt quantifiable, verifiable, and enforceable emission reduction measures by regulation that will achieve the statewide GHG emissions limit by 2020, to become operative on January 1, 2012, at the latest. The emission reduction measures may include direct emission reduction measures, alternative compliance mechanisms, and potential monetary and non-monetary incentives that reduce GHG emissions from any sources or categories of sources that ARB finds necessary to achieve the statewide GHG emissions limit.
- Monitor compliance with and enforce any emission reduction measure adopted pursuant to AB 32.

AB 32 required that by January 1, 2008, ARB determine what the statewide GHG emissions level was in 1990, and approve a statewide GHG emissions limit that is equivalent to that level, to be achieved by 2020. While the level of 1990 GHG emissions has not yet been officially approved, the ARB has estimated that the 1990 GHG emissions level was 427 MMT net CO_2e (ARB 2007b). In 2004, the emissions were estimated at 480 MMT net CO_2e (ARB 2007b). The ARB estimates that a reduction of 173 MMT net CO_2e emissions below business-as-usual would be required by 2020 to meet the 1990 levels (ARB 2007b). This amounts to a 15 percent reduction from today's levels, and a 30 percent reduction from projected business-as-usual levels in 2020 (ARB 2008).

Senate Bill 97. Senate Bill 97, enacted in 2007, amends the CEQA statute to clearly establish that GHG emissions and the effects of GHG emissions are appropriate subjects for CEQA analysis. It directs OPR to develop draft CEQA guidelines "for the mitigation of greenhouse gas emissions or the effects of greenhouse gas emissions" by July 1, 2009 and directs the Resources Agency to certify and adopt the CEQA guidelines by January 1, 2010.

Executive Order S-3-05. Executive Order S-3-05, signed by Governor Schwartzenegger on June 1, 2005, calls for a reduction in GHG emissions to 1990 levels by 2020 and for an 80 percent reduction in GHG emissions by 2050. Executive Order S-3-05 also calls for the California EPA (CalEPA) to prepare biennial science reports on the potential impact of continued GCC on certain sectors of the California economy. The first of these reports, "Our Changing Climate: Assessing Risks to California", and its supporting document "Scenarios of Climate Change in California: An Overview" were published by the California Climate Change Center in 2006.

California Code of Regulations Title 24. Although not originally intended to reduce greenhouse gas emissions, California Code of Regulations Title 24 Part 6: California's Energy Efficiency Standards for Residential and Nonresidential Buildings were first established in 1978 in response to a legislative mandate to reduce California's energy consumption. The standards are updated periodically to allow consideration and possible incorporation of new energy efficiency technologies and methods. The latest amendments were made in October 2005.

Energy efficient buildings require less electricity, natural gas, and other fuels. Electricity production from fossil fuels and on-site fuel combustion (typically for water heating) results in greenhouse gas emissions. Therefore, increased energy efficiency results in decreased greenhouse gas emissions.

State Standards Addressing Vehicular Emissions. California Assembly Bill 1493 (Pavley) enacted on July 22, 2002, required the ARB to develop and adopt regulations that reduce greenhouse gases emitted by passenger vehicles and light duty trucks. Regulations adopted by ARB will apply to 2009 and later model year vehicles. ARB estimates that the regulation will reduce climate change emissions from light duty passenger vehicle fleet by an estimated 18% in 2020 and by 27% in 2030 (AEP 2007). Once implemented, emissions from new light-duty vehicles are expected to be reduced in San Diego County by 21 percent by 2020. The federal Corporate Average Fuel Economy (CAFE) standard determines the fuel efficiency of certain vehicle classes in the United States. In 2007, as part of the Energy and Security Act of 2007, CAFE standards were increased for new light-duty vehicles to 35 miles per gallon by 2020. Executive Order S-01-07 was enacted by the Governor on January 18, 2007. Essentially, the order mandates the following: 1) that a statewide goal be established to reduce the carbon intensity of California's transportation fuels by at least 10 percent by 2020; and 2) that a Low Carbon Fuel Standard ("LCFS") for transportation fuels be established for California. It is assumed that the effects of the LCFS would be a 10% reduction in GHG emissions from fuel use by 2020.

1.3.2 Local Regulations and Standards

The County is working to develop a comprehensive strategy that will enhance the sustainability of County business operations and communities, building on the many energy efficient and environmentally sound practices already in place in County departments. Additionally, the County is working on the General Plan Update. The Update includes smart growth and land planning principles that will reduce Vehicle Miles Traveled (VMT) and thus result in a reduction in GHG emissions. The General Plan Update will result in development of an implementation plan for GHG reduction measures which will include the following actions:

- Prepare a climate change action plan with a baseline inventory and emissions reduction targets for greenhouse gas emissions from all sources.
- Develop regulations and procedures to encourage the design and construction of new buildings in accordance with “green building” programs.
- Develop regulations that encourage the use of energy recovery, as well as photovoltaic and wind energy in appropriate areas.

The County has also implemented a number of outreach programs such as the Green Building Program, lawn mower trade-in program, and reduction of solid waste by recycling to reduce air quality impacts as well as GHG emissions.

2.0 POTENTIAL CLIMATE CHANGE IMPACTS TO PROJECT SITE

2.1 Existing Conditions

The site is currently undeveloped and includes disturbed areas and native vegetation. The site is currently used as pasture/grazing land for approximately 80 head of cattle. Cattle themselves are a source of GHG emissions; however, it is not possible to quantify the emissions associated with the current site uses at this time due to uncertainty in the grazing uses.

Natural vegetation and soils temporarily store carbon as part of the terrestrial carbon cycle. Carbon is assimilated into plants and animals as they grow and then dispersed back into the environment when the die. There are two existing sources of carbon storage at the Project site: natural vegetation and soils. It is difficult to assess net changes in carbon storage associated with the Campus Park Project. The key issue is the balance between the loss of natural vegetation and future carbon storage associated with landscaping. The situation is further complicated by changes in fire regime. Carbon in natural vegetation is likely to be released into the atmosphere through wildfire every 20 to 150 years. Carbon in landscaped areas will be protected from wildfire. The balance between these factors will influence the long-term carbon budget on the site.

The majority of carbon within the site is stored in the soil. Soil carbon accumulates from inputs of plant and animal matter, roots, and other living components of the soil ecosystem (e.g., bacteria, worms, etc.). Soil carbon is lost through biological respiration, erosion, and other forms of disturbance. Overall, soil carbon moves more slowly through the carbon cycle, and it offers greater potential for long-term carbon storage. Field observations suggest that urban soils can sequester relatively large amounts of carbon. Observations from across the United States suggest that warmer and drier climates (such as southern California) may have slightly higher soil organic matter levels when compared to equivalent areas before development.

2.2 Typical Adverse Effects

The Climate Scenarios Report (CCCC 2006), uses a range of emissions scenarios developed by the IPCC to project a series of potential warming ranges (i.e., temperature increases) that may occur in California during the 21st century. Three warming ranges were identified: Lower warming range (3.0 to 5.5 degrees Fahrenheit (ºF)); medium warming range (5.5 to 8.0 ºF); and higher warming range (8.0 to 10.5 ºF). The Climate Scenarios report then presents an analysis of the future projected climate changes in California under each warming range scenario.

According to the report, substantial temperature increases would result in a variety of impacts to the people, economy, and environment of California. These impacts would result from a projected increase in extreme conditions, with the severity of the impacts depending upon actual future emissions of GHGs and associated warming. These impacts are described below.

Public Health. Higher temperatures are expected to increase the frequency, duration, and intensity of conditions conducive to air pollution formation. For example, days with weather conducive to O_3 formation are projected to increase by 25 to 35 percent under the lower warming range and 75 to 85 percent under the medium warming range. In addition, if global background O_3 levels increase as is predicted in some scenarios, it may become impossible to meet local air quality standards. An increase in wildfires could also occur, and the corresponding increase in the release of pollutants including $PM_{2.5}$ could further compromise air quality. The Climate Scenarios report indicates that large wildfires could become up to 55 percent more frequent of GHG emissions are not significantly reduced.

Potential health effects from global climate change may arise from temperature increases, climate-sensitive diseases, extreme events, and air quality. There may be direct temperature effects through increases in average temperature leading to more extreme heat waves and less extreme cold spells. Those living in warmer climates are likely to experience more stress and heat-related problems (e.g., heat rash and heat stroke). In addition, climate sensitive diseases (such as malaria, dengue fever, yellow fever, and encephalitis) may increase, such as those spread by mosquitoes and other disease-carrying insects.

Water Resources. A vast network of reservoirs and aqueducts capture and transport water throughout the State from northern California rivers and the Colorado River. The current distribution system relies on Sierra Nevada mountain snowpack to supply water during the dry spring and summer months. Rising temperatures, potentially compounded by decreases in precipitation, could severely reduce spring snowpack, increasing the risk of summer water shortages. In addition, if temperatures continue to rise more precipitation would fall as rain instead of snow, further reducing the Sierra Nevada spring snowpack by as much as 70 to 90 percent. The State's water resources are also at risk from rising sea levels. An influx of seawater would degrade California's estuaries, wetlands, and groundwater aquifers.

Agriculture. Increased GHG and associated increases in temperature are expected to cause widespread changes to the agricultural industry, reducing the quantity and quality of agricultural products statewide. Significant reductions in available water supply to support agriculture would also impact production. Crop growth and development will change as will the intensity and frequency of pests and diseases.

Ecosystems/Habitats. Continued global warming will likely shift the ranges of existing invasive plants and weeds, thus alternating competition patterns with native plants. Range expansion is expected in many species while range contractions are less likely in rapidly evolving species with significant populations already established. Continued global warming is also likely to increase the populations of and types of pests. Continued global warming would also affect natural ecosystems and biological habitats throughout the State.

Wildland Fires. Global warming is expected to increase the risk of wildfire and alter the distribution and character of natural vegetation. If temperatures rise into the medium warming range, the risk of large wildfires in California could increase by as much as 55 percent, which is almost twice the increase expected if temperatures stay in the lower warming range. However, since wildfire risk is determined by a combination of factors including precipitation, winds, temperature, and landscape and vegetation conditions, future risks will not be uniform throughout the State.

Rising Sea Levels. Rising sea levels, more intense coastal storms, and warmer water temperatures will increasing threaten the State's coastal regions. Under the high warming scenario, sea level is anticipated to rise 22 to 35 inches by 2100. A sea level risk of this magnitude would inundate coastal areas with salt water, accelerate coastal erosion, threaten levees and inland water systems, and disrupt wetlands and natural habitats.

3.0 CLIMATE CHANGE SIGNIFICANCE CRITERIA

The County of San Diego Department of Planning and Land Use (DPLU) has indicated that project sizes that are estimated to emit more than 900 metric tons of GHGs would be required to conduct a GHG analysis. The 900 metric ton screening threshold for determining when a GHG analysis is required was chosen based on available guidance from CAPCOA's *CEQA and Climate Change: Evaluating and Addressing Greenhouse Gas Emissions from Projects Subject to the California Environmental Quality Act* (CAPCOA 2008). This White Paper references a 900 metric ton guideline as a conservative threshold for requiring further analysis and mitigation. The GHG emissions from the Campus Park Project would be greater than 900 metric tons and would thus be above the screening threshold.

Since GCC is a global phenomenon, no direct impact would be identified for an individual land development project. The following criterion is considered to establish a significance threshold for GCC impacts:

- The project will conflict with the goals and strategies of AB 32 to reduce GHGs to 1990 levels by 2020.

At this time, AB 32 includes the following goals for reduction of GHG emissions:

2000 levels by 2010 (11% below business as usual)
1990 levels by 2020 (25% below business as usual)
80% below 1990 levels by 2050

For purposes of this Global Climate Change Evaluation, a target of 25% below business as usual has been established.

Projects that meet the criteria for conducting a climate change analysis are required to conduct a GHG inventory and disclose GHG emissions associated with project implementation and operation under "business as usual" conditions. "Business as usual" is defined as the emissions

that would have occurred in the absence of reductions mandated under AB 32. Based on the latest guidelines and baseline emission calculations, for energy efficiency, "business as usual" is considered to be the equivalent of as energy efficient as Title 24 requires as of 2006.

4.0 GREENHOUSE GAS INVENTORY

GHG emissions associated with the Campus Park Specific Plan were estimated separately for four categories of emissions: (1) construction; (2) energy use, including electricity and natural gas usage; (3) water consumption; and (4) transportation. The analysis includes a baseline estimate assuming Title 24-compliant buildings, which is considered business as usual for the Project. Emissions were estimated based on emission factors from the California Climate Action Registry General Reporting Protocol (CCAP 2008). This inventory presents emissions based on "business as usual" assumptions.

The complete emissions inventory is summarized below and included in the Appendix.

4.1 Construction Greenhouse Gas Emissions

Construction GHG emissions include emissions from heavy construction equipment, truck traffic, and worker trips. Emissions were calculated based on emission factors from the OFFROAD2007 model for heavy construction equipment for the San Diego Air Basin (CARB 2007), and from the EMFAC2007 model for on-road vehicles. Total greenhouse gases associated with construction are estimated at 16,052 tons (14,562 metric tons) of CO_2 total for the duration of construction. Construction emissions would be temporary.

4.2 Operational Greenhouse Gas Emissions

Energy Use Emissions. As discussed above, energy use generates GHG through emissions from power plants that generate electricity as well as emissions from natural gas usage at the facility itself.

Business as usual electricity use was estimated based on construction of the Campus Park Project to meet the requirements of Title 24 as of 2006. Emissions were calculated based on emission factors in the California Climate Action Registry General Reporting Protocol, Version 3.0 (CCAR 2008).

Natural gas use was also estimated based on construction of the Campus Park Project to meet the requirements of Title 24 as of 2006. Emissions were calculated based on emission factors in the California Climate Action Registry General Reporting Protocol, Version 3.0 (CCAR 2008).

The project proposes to develop 1,076 residential dwelling units. According to the California Energy Commission (2004), the average annual residential energy use rate is 5,914 kWh per residential unit.

Natural gas use was estimated based on average gas consumption per square foot as reported by SCAQMD (SCAQMD 1993). Natural gas consumption was multiplied by the CCAP emission factors for CO_2 equivalents per therm. CO_2 for household electricity and natural gas use were combined and converted to metric tons for reporting.

Electricity usage rates from the commercial retail and office developments were projected based on estimated annual rates of 13.55 kWh per square foot for retail space, and 12.95 kilowatt hours (kWh) per square foot of office space and (SCAQMD 1999). Emissions of GHG were then calculated using emission factors from the California Climate Action Registry General Reporting Protocol (CCAP 2007), which provide an estimate of pounds of emissions for a given amount of annual electricity usage. Natural gas usage was estimated based on estimated annual natural gas consumption of 2.0 cubic feet of gas per square foot per month for office space and 2.9 cubic feet of gas per square foot per month of retail space (SCAQMD 1999).

Water. Water use and energy use are often closely linked. The provision of potable water to commercial users consumes large amounts of energy associated with five stages: source and conveyance, treatment, distribution, end use, and wastewater treatment. This inventory estimated that delivered water for the project will have an embodied energy of 3,519 kWh/acre foot or 0.0108 kWh/gallon (Wilkinson and Wolfe 2005).

Water demand estimates were based on information on water requirements for the Campus Park Project. GHG emissions were calculated based on an average consumption of 578,300 gallons

per day. The embodied energy demand associated with this water use was converted to GHG emissions with the same electrical grid coefficients as the other purchased electricity.

Transportation. As discussed in Section 1.2, on-road vehicle emissions account for 46% of existing GHG emissions in San Diego County. Several regulatory initiatives have been passed to reduce emissions from on-road vehicles, as discussed in Section 1.3. These initiatives include improvements in the CAFE standard included in Title 49 of the Energy Independence and Security Act of 2007, AB 1493, and the Low Carbon Fuel Standard (LCFS). The federal CAFE standard determines the fuel efficiency of certain vehicle classes in the United States, and has remained largely unchanged since 1990; however, federal initiatives have increased CAFE standards for new light-duty vehicles to 35 miles per gallon by 2020. The new CAFE standards will take effect no sooner than 2011, which was the start date used in the SDCGHGI. It is anticipated that CAFE standard improvements would reduce GHG emissions by 5 percent by the year 2016, and by 12 percent by the year 2020. For the purpose of this analysis, it CAFE standard reductions were not accounted for.

AB 1493 (also known as the Pavley Bill), is a standard for new light-duty passenger vehicles. AB 1493 has not been implemented due to legal challenges, but requires automobile manufacturers to reduce vehicle emissions of GHGs in light-duty vehicles, which are defined as light-duty passenger cars, light-duty trucks, and medium-duty trucks/vehicles. If implemented, ARB estimates that the regulation will reduce climate change emissions from light duty passenger vehicle fleet by an estimated 18% in 2020 and by 27% in 2030 (AEP 2007). Once implemented, emissions from new light-duty vehicles are expected to be reduced in San Diego County by 21 percent by 2020. For the purpose of this analysis, it was assumed that an 18% reduction in GHG emissions would occur.

The LCFS was included in Executive Order S-01-07, and addresses the type of fuel used in vehicles. The LCFS seeks to reduce the carbon content of the fuel, therefore reducing GHG emissions even if the total fuel consumption is not reduced. The LCFS has been approved by ARB as a discrete early action item under AB 32 and implementing regulations are currently under development. The SDCGHGI assumed a 10 percent reduction in GHG emissions in San

Diego County by the year 2020 due to the LCFS. For the purpose of this analysis, a 10% reduction in GHG was assumed due to the LCFS.

The results of the inventory for operational emissions for business as usual are presented in Table 5. These include GHG emissions associated with buildings (natural gas, purchased electricity) and water consumption (energy embodied in potable water). Table 5 summarizes projected emissions using the methodologies noted above.

Table 5
SUMMARY OF ESTIMATED OPERATIONAL GREENHOUSE GAS EMISSIONS
BUSINESS AS USUAL SCENARIO

Emission Source	**Annual Emissions (Metric tons/year)**		
	CO_2	**CH_4**	**N_2O**
Operational Emissions			
Electricity Use Emissions	3,677	0.028	0.015
Natural Gas Use Emissions	1,416	0.016	0.003
Water Consumption Emissions	715	0.005	0.003
Vehicle Emissions	30,956	2	2
Total	36,764	2.05	2.02
Global Warming Potential Factor	**1**	**21**	**310**
CO_2 Equivalent Emissions	36,764	43	627
TOTAL CO_2 Equivalent Emissions	**37,434**		

5.0 SUMMARY OF PROJECT DESIGN FEATURES, IMPACTS, AND MITIGATION MEASURES

As discussed in Section 3.0, a significance threshold of 25% below "business as usual" levels is considered to demonstrate that a project would be consistent with the goals of AB 32. The Campus Park Specific Plan has developed a list of project design features that have been included in the project design. These project design features will reduce emissions of GHG by implementing energy efficiency measures, water conservation measures, and programs to reduce VMT.

Project Design Features (PDFs) and potential GHG reduction measures proposed by the Project Applicant are presented in Table 6. As shown in Table 6, a wide range of PDFs and GHG reduction measures are incorporated in the project ranging from water use efficiency to building energy efficiency and landscaping, to smart growth land use patterns, solid waste diversion and education. These include measures that are listed in the CAPCOA document, as well as other measures that may be applicable to the project. Table 6 presents the measure, citation from CAPCOA (2008) (if applicable), and estimated range of GHG reductions that would be achievable from the measure.

The Campus Park Project will use reclaimed water to the extent possible. It is not possible at this time to estimate the amount of reclaimed water that will be available; however, water conservation measures would reduce GHG by at least 12% below business as usual.

Building energy efficiency measures include overall building energy performance equivalent to 20% below current Title 24 standards. This will be achieved through a variety of measures in the design of the residences. The residents at Campus Park will be offered a choice of energy efficient appliances (including washers/dryers and refrigerators) and appliances installed by builders will be Energy Star (including dishwashers).

The use of smart growth land use patterns that reduce the amount of land being developed will reduce GHG emissions. The Project Applicant will also provide educational materials for residents and commercial tenants discussing strategies to reduce GHG emissions consistent with CARB's Early Action Guidance regarding reduction of GHG emissions.

Table 6
Proposed Project Design Features to Reduce GHG Emissions

GHG Reduction Measure	Citation	Minimum % Reduction	Maximum % Reduction
Nonresidential projects provide plentiful short- and long- term bicycle parking facilities to meet peak season maximum demand (e.g., one bike rack space per 20 vehicle/employee parking spaces).	**T-1**	**1%**	**5%**
Long-term bicycle parking is provided at apartment complexes or condominiums without garages (e.g., one long-term bicycle parking space for each unit without a garage. Long-term facilities shall consist of one of the following: a bicycle locker, a locked room with standard racks and access limited to bicyclists only, or a standard rack in a location that is staffed and/or monitored by video surveillance 24 hours/day.	**T-3**	**1%**	**5%**
Entire project is located within one-half mile of an existing/planned Class I or Class II bike lane and project design includes a comparable network that connects the project to the existing offsite facility. Project design includes a designated bicycle route connecting all units, on-site bicycle parking facilities, offsite bicycle facilities, site entrances, and primary building entrances to existing Class I or Class II bike lane(s) within one-half mile. Bicycle route connects to all streets contiguous with project site. Bicycle route has minimum conflicts with automobile parking and circulation facilities. All streets internal to the project wider than 75 feet have Class II bicycle lanes on both sides.	**T-4**	**1%**	**5%**
The project provides a pedestrian access network that internally links all uses and connects to all existing/planned external streets and pedestrian facilities contiguous with the project site. Project design includes a designated pedestrian route interconnecting all internal uses, site entrances, primary building entrances, public facilities, and adjacent uses to existing external pedestrian facilities and streets. Route has minimal conflict with parking and automobile circulation facilities. Streets within the project have sidewalks on both sides. All sidewalks are a minimum of five feet wide and feature vertical curbs. Pedestrian facilities and improvements such as grade separation, wider sidewalks, and traffic calming are implemented wherever feasible to minimize pedestrian barriers. All site entrances provide pedestrian access.	**T-5**	**1%**	**10%**

Table 6
Proposed Project Design Features to Reduce GHG Emissions

GHG Reduction Measure	Citation	Minimum % Reduction	Maximum % Reduction
Site design and building placement minimizes barriers to pedestrian access and interconnectivity. Physical barriers such as walls, berms, landscaping, and slopes between residential and nonresidential uses that impede bicycle or pedestrian circulation are eliminated.	**T-6**	Site design and building placement minimizes barriers to pedestrian access and interconnectivity. Physical barriers such as walls, berms, landscaping, and slopes between residential and nonresidential uses that impede bicycle or pedestrian circulation are eliminated.	**T-6**
Bus or streetcar services provides headways of one hour or less for stops within one-quarter mile; project provides safe and convenient bicycle/pedestrian access to transit stop(s) and provides essential transit stop improvements (i.e., shelters, route information, benches, and lighting).	**T-7**	**1%**	**2%**
Project design includes pedestrian/bicycle safety and traffic calming measures in excess of jurisdiction requirements. Roadways are designed to reduce motor vehicle speeds and encourage pedestrian and bicycle trips by featuring traffic calming features. All sidewalks internal and adjacent to project site are minimum of five feet wide. All sidewalks feature vertical curbs. Roadways that converge internally within the project are routed in such a way as to avoid "skewed intersections;" which are intersections that meet at acute, rather than right, angles. Intersections internal and adjacent to the project feature one or more of the following pedestrian safety/traffic calming design techniques: marked crosswalks, count-down signal timers, curb extensions, speed tables, raised crosswalks, raised intersections, median islands, tight corner radii, and roundabouts or mini-circles. Streets internal and adjacent to the project feature pedestrian safety/traffic calming measures such as on-street parking, planter strips with street trees, and chicanes/chokers (variations in road width to discourage high-speed travel).	**T-8**	**1%**	**10%**

Table 6
Proposed Project Design Features to Reduce GHG Emissions

GHG Reduction Measure	Citation	Minimum % Reduction	Maximum % Reduction
Provide minimum amount of parking required. Once land uses are determined, the trip reduction factor associated with this measure can be determined by utilizing the ITE parking generation publication. The reduction in trips can be computed as shown below by the ratio of the difference of minimum parking required by code and ITE peak parking demand to ITE peak parking demand for the land uses multiplied by 50%. Percent Trip Reduction = 50 * [(min parking required by code – ITE peak parking demand)/(ITE peak parking demand)]	**T-10**	**1%**	**30%**
Provide preferential parking space locations for EVs/CNG vehicles.	**T-17**	**Unknown**	**Unknown**
Provide a reduced/no parking fee for EVs/CNG vehicles.	**T-18**	**Unknown**	**Unknown**
Project is oriented towards existing transit, bicycle, or pedestrian corridor. Setback distance between project and existing or planned adjacent uses is minimized or nonexistent. Setback distance between different buildings on project site is minimized. Setbacks between project buildings and planned or existing sidewalks are minimized. Buildings are oriented towards existing or planned street frontage. Primary entrances to buildings are located along planned or existing public street frontage. Project provides bicycle access to any planned bicycle corridor(s). Project provides pedestrian access to any planned pedestrian corridor(s).	**D-2**	**0.4%**	**1%**
Project provides high-density residential development. Transit facilities must be within one-quarter mile of project border. Project provides safe and convenient bicycle/pedestrian access to all transit stop(s) within one-quarter mile of project border.	**D-4**	**1%**	**40%**
Multiple and direct street routing (grid style). This measure only applies to projects with an internal CF >/= 0.80, and average of one-quarter mile or less between external connections along perimeter of project. [CF= # of intersections / (# of cul-de-sacs + intersections)]. Cul-de-sacs with bicycle/pedestrian through access may be considered "complete intersections" when calculating the project's internal connectivity factor. External connections are bike/pedestrian pathways and access points, or streets with safe and convenient bicycle and pedestrian access that connect the project to adjacent streets, sidewalks, and uses. If project site is adjacent to undeveloped land; streets, pathways, access points, and right-of-ways that provide for future access to adjacent uses may count for up to 50% of the external connections. Block perimeter (the sum of the measurement of the length of all block sides) is limited to no more than 1,350 feet. Streets internal to the project should connect to streets external to the project whenever possible.	**D-5**	**1%**	**1%**
Provide residential buildings with a "utility" room or space for recharging batteries, whether for use in a car, electric lawnmower, other electric landscaping equipment, or even batteries for small items such as flashlights.	**D-8**	**Unknown**	**Unknown**

Table 6
Proposed Project Design Features to Reduce GHG Emissions

GHG Reduction Measure	Citation	Minimum % Reduction	Maximum % Reduction
Have at least three of the following on site and/or offsite within one-quarter mile: Residential Development, Retail Development, Park, Open Space, or Office.	**D-10**	**3%**	**3%**
Project shall use drought resistant native trees, trees with low emissions and high carbon sequestration potential. Evergreen trees on the north and west sides afford the best protection from the setting summer un and cold winter winds. Additional considerations include the use of deciduous trees on the south side of the house that will admit summer sun; evergreen plantings on the north side will slow cold winter winds; constructing a natural planted channel to funnel summer cooling breezes into the house. Neighborhood CCR's not requiring that front and side yards of single family homes be planted with turf grass. Vegetable gardens, bunch grass, and low-water landscaping shall also be permitted, or even encouraged.	**D-17**	**Unknown**	**Unknown**
Project features only natural gas or electric stoves in residences.	**E-3**	**Unknown**	**Unknown**
The project will provide shade and will use light-colored/high albedo materials for at least 30% of the site's nonroof impervious surfaces.	**E-8**	**1%**	**1%**
Project provides cool roofs. Highly reflective, highly emissive roofing materials that stay 50-60°F cooler than a normal roof under a hot summer sun. CA's Cool Savings Program provided rebates to building owners for installing roofing materials with high solar reflectance and thermal emittance. The highest rebate went to roofs on air conditioned buildings, while buildings with rooftop ducts and other nonresidential buildings were eligible for slightly less. The program aimed to reduce peak summer electricity demand and was administered by the CEC.	**E-13**	**Unknown**	**Unknown**

Table 6
Proposed Project Design Features to Reduce GHG Emissions

GHG Reduction Measure	Citation	Minimum % Reduction	Maximum % Reduction
Project provides electrical outlets at building exterior areas.	**E-15**	**Unknown**	**Unknown**
Project uses energy efficient appliances (e.g., Energy Star).	**E-16**	**Unknown**	**Unknown**
Install energy-reducing programmable thermostats that automatically adjust temperature settings.	**E-20**	**Unknown**	**Unknown**
Install energy-reducing passive heating and cooling systems (e.g., insulation and ventilation).	**E-21**	**Unknown**	**Unknown**
Install energy-reducing day lighting systems (e.g., skylights, light shelves and interior transom windows).	**E-22**	**Unknown**	**Unknown**
Wall Insulation – Increase exterior wall insulation	**NA**	**0.14%**	**2.35%**
Roof Insulation – Increase roof insulation	**NA**	**0.11%**	**2.96%**
Install low energy traffic signals & energy efficient (sodium) street lighting	**NA**	**Unknown**	**Unknown**
Buildings to be designed utilizing double-paned windows	**NA**	**Unknown**	**Unknown**
Buildings to be designed utilizing door sweeps and weather stripping	**NA**	**Unknown**	**Unknown**
Buildings to be designed utilizing electric light dimming controls where feasible	**NA**	**Unknown**	**Unknown**
Buildings to be designed utilizing double-paned windows	**NA**	**Unknown**	**Unknown**
Buildings to be designed to utilize high efficiency heating & cooling systems	**NA**	**Unknown**	**Unknown**
Install water-saving irrigation systems	**NA**	**Unknown**	**Unknown**
Install drought resistant plants in lieu of turf where feasible and appropriate	**NA**	**Unknown**	**Unknown**
Use recycled water for irrigation where available	**NA**	**Unknown**	**Unknown**
Achieve 50% Statewide Diversion Goal – Campus Park will provide residents with separate recycling and waste receptacles to support the 50% state-wide solid waste diversion goal (AB 939).	**NA**	**Unknown**	**Unknown**
Campus Park will strive for a 50% reduction in residential water use through features such as low-flow appliances (incl. toilets, shower heads, washing machines), a drought-tolerant landscape palette, weather-based irrigation controllers, and other water conservation measures	**NA**	**Unknown**	**Unknown**
Campus Park will provide educational materials for residents discussing strategies for reducing GHG emissions associated with the operation of their buildings (CARB Early Action Measure/Education 2-7).	**NA**	**Unknown**	**Unknown**
The Campus Park Project includes residential, retail, and office uses that encourage reduction in vehicle miles traveled and the use of alternative transportation to access the retail and office centers through pedestrian and bicycle access.	**NA**	**Unknown**	**Unknown**

Table 6
Proposed Project Design Features to Reduce GHG Emissions

GHG Reduction Measure	Citation	Minimum % Reduction	Maximum % Reduction
Campus Park will use reclaimed water, if available, to the extent possible.	**NA**	**Unknown**	**Unknown**
Buildings at Campus Park will achieve energy performance equivalent to 20% better than current Title 24 standards.	**NA**	**20% of electricity and natural gas emissions**	**20% of electricity and natural gas emissions**

Not all of the GHG reductions that would be realized through implementation of the project design features identified in Table 6 are quantifiable. To calculate emissions of GHGs that take into account specific quantifiable reductions, it was assumed that achieving energy performance equivalent to 20% better than current Title 24 standards would reduce emissions of GHG from electricity and natural gas usage by 20%. It was also assumed that the use of reclaimed water would reduce emissions of GHG from water usage by 12% based on project-specific estimates. It was further assumed that state and federal vehicle programs would reduce GHG emissions from vehicles by 28%, and a further 8% would be realized through by virtue of the project's design as a mixed-use development goals and bicycle/pedestrian access. The results of the GHG inventory for emissions with implementation of GHG reduction measures are presented in Table 7. As shown in Table 7, the project will meet the significance threshold to reduce operational GHG emissions by 25%. The Project would therefore be consistent with the goals of AB 32 within San Diego County, and would not result in a significant impact on global climate.

Table 7 SUMMARY OF ESTIMATED OPERATIONAL GREENHOUSE GAS EMISSIONS			
Business as Usual			
Emission Source	**Annual Emissions (Metric tons/year)**		
	CO_2	**CH_4**	**N_2O**
Operational Emissions			
Electricity Use Emissions	3,677	0.028	0.015
Natural Gas Use Emissions	1,416	0.016	0.003
Water Consumption Emissions	715	0.005	0.003
Vehicle Emissions	30,956	2	2
Total	36,764	2.05	2.02
Global Warming Potential Factor	**1**	**21**	**310**
CO_2 Equivalent Emissions	36,764	43	627
TOTAL CO_2 Equivalent Emissions	**37,434**		
With GHG Reduction Measures			
Electricity Use Emissions	2,647	0.020	0.011
Natural Gas Use Emissions	1,133	0.13	0.0021
Water Consumption Emissions	629	0.005	0.003
Vehicle Emissions[a]	19,812	1.3	1.3
Total	24,221	1.4	1.3
Global Warming Potential Factor	**1**	**21**	**310**
CO_2 Equivalent Emissions	24,221	29	403
TOTAL CO_2 Equivalent Emissions	**24,653**		
Percent Reduction from Business As Usual	**34%**		

[a]Accounting for reductions estimated through state vehicle emission reduction programs amounting to 28% reduction in GHG, and through mixed-use development goals and bicycle/pedestrian access, assumed to reduce vehicle emissions by an additional 8% based on URBEMIS Model assumptions.

With implementation of the measures listed above and presented in this analysis, the Campus Park Specific Plan will meet the goals of AB 32.

6.0 CONCLUSIONS

Emissions of GHGs would result in a net increase in emissions from construction and operations. As discussed in Section 5.0, emissions would be reduced to below the level of significance

adopted for this analysis through the implementation of PDFs and mitigation measures designed to reduce GHG to at least 25 percent below "business as usual" levels. Because the Campus Park Project would reduce GHG emissions by more than 25% below business as usual, the project conforms with the goals of AB 32. The Project would therefore not result in any direct impacts to the global climate, and cumulative impacts would be reduced to a level that is less than significant.

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8.0 LIST OF PREPARERS, PERSONS AND ORGANIZATIONS CONTACTED

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Appendix A

Greenhouse Gas Emission Calculations

Table A-1
Summary of Operational Greenhouse Emissions
Campus Park

Campus Park

Emission Source	CO_2E[e] (Metric Tons)
Project	
Mobile Sources[a]	31,555
Electricity[b]	3,683
Natural gas[c]	1,328
Water Usage[d]	716
Total	**37,281**
Total	37281

[a] *Mobile source values were derived using EMFAC2007 in addition to the California Climate Action Registry General Reporting Protocol; Version 2.2, March 2008.*

[b] *Electricity Usage Rates from Table A9-11-A, CEQA Air Quality Handbook, SCAQMD, 1993.*

[c] *Natural Gas Usage Rates from Table A9-12-A, CEQA Air Quality Handbook, SCAQMD, 1993.*

[d] *Water Usage Rates based on project information.*

[e] *All CO2E factors were derived using the California Climate Action Registry General Reporting Protocol; Version 3.0, April 2008*

Campus Park - with GHG reduction measures

Emission Source	CO_2E[e] (Metric Tons)
Project	
Mobile Sources[a]	
Electricity[b]	2,651
Natural gas[c]	1,062
Water Usage[d]	630
Total	**4,344**
Total % Reduction	88%

[a] *Mobile source values were derived using EMFAC2007 in addition to the California Climate Action Registry General Reporting Protocol; Version 2.2, March 2008.*

[b] *Electricity Usage Rates from Table A9-11-A, CEQA Air Quality Handbook, SCAQMD, 1993.*

[c] *Natural Gas Usage Rates from Table A9-12-A, CEQA Air Quality Handbook, SCAQMD, 1993.*

[d] *Water Usage Rates based on project information.*

[e] *All CO2E factors were derived using the California Climate Action Registry General Reporting Protocol; Version 3.0, April 2008*

Table A-2
Electricity Greenhouse Gases
Business as Usual
Campus Park

Electricity

Land Use	1,000 Sqft	Usage Rate [a] (kWh\sq.ft\yr)	(KWh\year)	MWh\year
Project			0	0.00
Office	157.0	12.95	2,033,150	2033.15
Retail	61.2	13.55	829,260	829.26
Hotel/Motel		9.95	0	0.00
Restaurant		47.45	0	0.00
Food Store		53.30	0	0.00
Warehouse		4.35	0	0.00
Cinema		11.55	0	0.00
High School		10.50	0	0.00
Elementary School		5.90	0	0.00
Hospital		21.70	0	0.00
Library		10.50	0	0.00
Residential (DU)	1076.0	5,914	6,363,464	6363.46
Total Project			**9,225,874**	**9225.87**

[a] Electricity Usage Rates from Table A9-11-A, CEQA Air Quality Handbook, SCAQMD, 1993.

GHG	lbs/MWh[b]	lbs	metric tons	CO_2E
Project				
CO_2	878.71	8106867.743	3677.210353	3677.210353
CH_4	0.0067	61.8133558	0.028038044	0.588798917
N_2O	0.0037	34.1357338	0.015483696	4.799945687
				3682.60 **Total Annual CO2E**

[b] Emission factors for CO_2, CH_4, and N_2O were derived from the California Climate Action Registry General Reporting Protocol; Version 2.2, March 2007

Table A-3
Natural Gas Greenhouse Gas Emissions
Business as Usual
Campus Park

Natural Gas

Land Use	1,000 Sqft	Usage Rate[c] (cu.ft\sq.ft\mo)	Total Natural Gas Usage (cu.ft\mo)	Total Natural Gas Usage (cu.ft\year)	Total Natural Gas Usage (MMBTU\year)
Project					
Office	157.0	2.0	314,000	3,768,000	
Retail	61.2	2.9	177,480	2,129,760	2,172
Hotel/Motel	0.0	4.8	-	-	-
Restaurant	0.0	4.8	-	-	-
Food Store	0.0	2.9	-	-	-
Warehouse	0.0	2.0	-	-	-
Cinema	0.0	4.8	-	-	-
High School	0.0	2.9	-	-	-
Elementary School	0.0	2.0	-	-	-
Hospital	0.0	4.8	-	-	-
Library	0.0	2.9	-	-	-
Residential (DU)	1076.0	4,012	4,316,374	51,796,488	52,832
Total Project			4,807,854	**57,694,248**	**55,005**

[a] Natural Gas Usage Rates from Table A9-12-A, CEQA Air Quality Handbook, SCAQMD, 1993.

GHG	Kg/MMBtu[b]	Kg	metric tons	CO_2E (Metric Tons)
Project				
CO_2	53.06	2,918,553.25	1,323.83	1,323.83
CH_4	0.0059	324.53	0.15	3.09
N_2O	0.0001	5.50	0.0025	0.77

1327.70 Total Annual CO2E

[b] Emission factors for CO_2, CH_4, and N_2O were derived from the California Climate Action Registry General Reporting Protocol; Version 2.2, March 2007

Table A-4
Water Use Greenhouse Gas Emissions
Business as Usual
Campus Park

Electricity

Land Use	GPD	Usage Rate (kWh\gal)	(KWh\year)	MWh\year
Project	578300	8500	1,794,176	1794.18

[a] Electricity Usage Rates from Table A9-11-A, CEQA Air Quality Handbook, SCAQMD, 1993.

GHG	lbs/MWh[b]	lbs	metric tons	CO_2E
Project				
CO_2	878.71	1576560.173	715.1150821	715.1150821
CH_4	0.0067	12.02097753	0.005452619	0.114505004
N_2O	0.0037	6.638450275	0.003011148	0.933455861
				716.16 Total Annual CO2E

[b] Emission factors for CO_2, CH_4, and N_2O were derived from the California Climate Action Registry General Reporting Protocol; Version 2.2, March 2007

Table A-5
Electricity Greenhouse Gases
with GHG Reduction Measures
Campus Park

Electricity

Land Use	1,000 Sqft	Usage Rate [a] (kWh\sq.ft\yr)	(KWh\year)	MWh\year
Project			0	0.00
Office	157.0	9.32	1,463,868	1463.87
Retail	61.2	9.76	597,067	597.07
Hotel/Motel		9.95	0	0.00
Restaurant		47.45	0	0.00
Food Store		53.30	0	0.00
Warehouse		4.35	0	0.00
Cinema		11.55	0	0.00
High School		10.50	0	0.00
Elementary School		5.90	0	0.00
Hospital		21.70	0	0.00
Library		10.50	0	0.00
Residential (DU)	1076.0	4,258	4,581,694	4581.69
Total Project			**6,642,629**	**6642.63**

[a] Electricity Usage Rates from Table A9-11-A, CEQA Air Quality Handbook, SCAQMD, 1993.

GHG	lbs/MWh[b]	lbs	metric tons	CO_2E
Project				
CO_2	878.71	5836944.775	2647.591454	2647.591454
CH_4	0.0067	44.50561618	0.020187391	0.423935221
N_2O	0.0037	24.57772834	0.011148261	3.455960895
				2651.47 **Total Annual CO2E**

[b] Emission factors for CO_2, CH_4, and N_2O were derived from the California Climate Action Registry General Reporting Protocol; Version 2.2, March 2007

Table A-6
Natural Gas Greenhouse Gas Emissions
with GHG Reduction Measures
Campus Park

Natural Gas

Land Use	1,000 Sqft	Usage Rate[c] (cu.ft\sq.ft\mo)	Total Natural Gas Usage (cu.ft\mo)	Total Natural Gas Usage (cu.ft\year)	Total Natural Gas Usage (MMBTU\year)
Project					
Office	157.0	1.6	251,200	3,014,400	
Retail	61.2	2.3	141,984	1,703,808	1,738
Hotel/Motel	0.0	4.8	-	-	-
Restaurant	0.0	4.8	-	-	-
Food Store	0.0	2.9	-	-	-
Warehouse	0.0	2.0	-	-	-
Cinema	0.0	4.8	-	-	-
High School	0.0	2.9	-	-	-
Elementary School	0.0	2.0	-	-	-
Hospital	0.0	4.8	-	-	-
Library	0.0	2.9	-	-	-
Residential (DU)	1076.0	3,209	3,453,099	41,437,190	42,266
Total Project			3,846,283	**46,155,398**	**44,004**

[a] Natural Gas Usage Rates from Table A9-12-A, CEQA Air Quality Handbook, SCAQMD, 1993.

GHG	Kg/MMBtu[b]	Kg	metric tons	CO_2E (Metric Tons)
Project				
CO_2	53.06	2,334,842.60	1,059.07	1,059.07
CH_4	0.0059	259.62	0.12	2.47
N_2O	0.0001	4.40	0.0020	0.62

1062.16 Total Annual CO2E

[b] Emission factors for CO_2, CH_4, and N_2O were derived from the California Climate Action Registry General Reporting Protocol; Version 2.2, March 2007

Table A-7
Water Use Greenhouse Gas Emissions
with GHG Reduction Measures
Campus Park

Electricity

Land Use	GPD	Usage Rate (kWh\gal)	(KWh\year)	MWh\year
Project	508904	8500	1,578,875	1578.87

[a] Electricity Usage Rates from Table A9-11-A, CEQA Air Quality Handbook, SCAQMD, 1993.

GHG	lbs/MWh[b]	lbs	metric tons	CO_2E
Project				
CO_2	878.71	1387372.952	629.3012723	629.3012723
CH_4	0.0067	10.57846022	0.004798305	0.100764404
N_2O	0.0037	5.841836242	0.00264981	0.821441157
				630.22 Total Annual CO2E

[b] Emission factors for CO_2, CH_4, and N_2O were derived from the California Climate Action Registry General Reporting Protocol; Version 2.2, March 2007

Table A-8
Project-Related Traffic GHG Emissions
Campus Park Project

External Trips

Vehicle Class	Number of Daily Trips	Speed (mph)	VMT (mi/vehicle-day)	CO2 Running Exhaust (g/mi)	CO2 Start-Up (g/start)[a]	CH4 Running Exhaust (g/mi)	CH4 Start-Up (g/start)[a]	N2O Running Exhaust (g/mi)	N2O Start-Up (g/start)[a]	Emissions, lbs/day CO2	CH4	N2O	Emis CO2
Light-duty auto	10888	33	17.1	319.478	162.144	0.016	0.034	0.017385	0.034865	135028	7	8	24643
Light-duty truck	3071	33	17.1	398.704	196.19	0.017	0.028	0.01919	0.03344	47488	2	2	8667
	13959									**182516**	**10**	**10**	**33309**

Assuming 2015 Emission Factors, EMFAC2007, startup after 8 hours

Vehicle Class	Number of Daily Trips	Speed (mph)	VMT (mi/vehicle-day)	CO2 Running Exhaust (g/mi)	CO2 Start-Up (g/start)[a]	CH4 Running Exhaust (g/mi)	CH4 Start-Up (g/start)[a]	N2O Running Exhaust (g/mi)	N2O Start-Up (g/start)[a]	Emissions, lbs/day CO2	CH4	N2O	Emis CO2
Light-duty auto	10888	33	17.1	317.556	159.491	0.007	0.012	0.008455	0.00931	134176	3	4	24487
Light-duty truck	3071	33	17.1	400.37	200.631	0.005	0.004	0.003705	0.00418	47711	1	0	8707
	13959									**181886**	**4**	**4**	**33194**

Assuming 2040 Emission Factors, EMFAC2007, startup after 8 hours

Internal Trips

Vehicle Class	Number of Daily Trips	Speed (mph)	VMT (mi/vehicle-day)	CO2 Running Exhaust (g/mi)	CO2 Start-Up (g/start)[a]	CH4 Running Exhaust (g/mi)	CH4 Start-Up (g/start)[a]	N2O Running Exhaust (g/mi)	N2O Start-Up (g/start)[a]	Emissions, lbs/day CO2	CH4	N2O	Emis CO2
Light-duty auto	4666	33	0.5	319.478	162.144	0.016	0.034	0.017385	0.034865	3311	0	0	604
Light-duty truck	1316	33	0.5	398.704	196.19	0.017	0.028	0.01919	0.03344	1148	0	0	209
	5982									**4459**	**1**	**1**	**814**

Assuming 2015 Emission Factors, EMFAC2007, startup after 1 hour

Vehicle Class	Number of Daily Trips	Speed (mph)	VMT (mi/vehicle-day)	CO2 Running Exhaust (g/mi)	CO2 Start-Up (g/start)[a]	CH4 Running Exhaust (g/mi)	CH4 Start-Up (g/start)[a]	N2O Running Exhaust (g/mi)	N2O Start-Up (g/start)[a]	Emissions, lbs/day CO2	CH4	N2O	Emis CO2
Light-duty auto	4666	33	0.5	317.556	159.491	0.007	0.012	0.008455	0.00931	3274	0	0	597
Light-duty truck	1316	33	0.5	400.37	200.631	0.005	0.004	0.003705	0.00418	1163	0	0	212
	5982									**4437**	**0**	**0**	**810**

Assuming 2040 Emission Factors, EMFAC2007, startup after 1 hour

30956
31555.38

Road Dust

	Road Dust PM10 Emission Factor, lb/VMT	K	SL
	9.68635E-05	0.016	0.0285
	lbs/day	tons/year	
External Trips	23.12	4.22	
Internal Trips	0.29	0.05	

Vehicle Weights	Weight	Fraction
LDA	2	0.467
LDT1	2.35	0.086
	2.077	